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"Leaving Home: Three Decades of Internationalization by American Automobile Firms."

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I. Introduction

The surge in foreign investment and trade over the past two decades has opened debates about the effect of globalization on national economic structures and performance and the ability of governments to direct domestic economies. On one side are those who argue that with increased capital flows and growth of cross-border production networks, the era of the national economy has passed. On the other side are those who argue that the national economy is likely to endure either because globalization is a less powerful force than popularly believed or because domestic structures are strong enough to survive even in a world of increased trade and cross-border capital flows.[1]

These debates, like others tied to globalization, highlight differences between foreign investment driven by demand-side motivations, usually the search for new markets, and investment driven by supply-side conditions, such as the search for lower-cost production sites. These two motivations for investment, it is believed, generate different geographical patterns of investment; have different effects on home and host labor markets; and imply different roles for the state in shaping domestic economic outcomes.

When market access is the primary determinant of foreign investment, firms are likely to create "horizontal" production structures that replicate production structures in the home country. A wide range of jobs will be generated in or transferred to host countries, thus contributing to workforce and industrial developments in host countries. Investment driven by supply-side motivations, though, tends to be articulated in "vertical" direct investment in which low-skilled, labor-intensive production is shifted from plants in high-wage countries to affiliates in low-wage countries. This process, some fear, threatens employment and wages of low-skilled workers in home countries and contributes little to the development of skills or industrial linkages in the host countries.[2,3]

The two types of investment also have different implications for the ability of the state to fashion policies to respond to the threat and promise of internationalization. Because

[1] See e.g., Wade, 1996 for an argument that the extent of globalization is exaggerated. See e.g., Streek, 1996 on the resiliency of national systems of production.

[2] For a discussion of vertical and horizontal investment and the relationship between foreign investment and employment in home and host countries, see WTO, 1996.

[3] The net effect of market-seeking investment is determined by the magnitude of job loss from trade displacement versus job gain associated with rising exports to affiliates. The net effect of cost-cutting investment on labor demand is a function of the number of jobs transferred to foreign affiliates and the potential job gain from increased competitiveness. See WTO, 1996.

market-seeking investment is shaped largely by host market conditions, internationalization will act as a secular force that reduces labor demand in all advanced countries and domestic institutions will act only to shape specific national outcomes, e.g., whether a fall in demand is translated into falling wages loss or rising unemployment.[4] In this case, because incentives to internationalize are rooted in host country demand structures, home policy responses are largely limited to compensatory policies for those who suffer employment or wage loss due to foreign production of international firms.

When investment is motivated to reduce production costs, though, domestic institutions do not simply mediate demand changes but also generate the conditions that make internationalization a more or less likely strategy of domestic firms. Because domestic productive arrangements shape firm incentives and strategies, the state has at hand a variety of policy levers, from training and education subsidies to tax breaks for technological upgrading, to slow or reverse internationalization of domestic firms. In a world driven by the requirements of production systems rather than markets, the state may shape rather than simply respond to internationalization of domestic firms.

Distinguishing between market-seeking and cost-cutting investments, then, is useful because it highlights important differences in the effects of each type of investment on home and host labor markets and the power of the state to shape national economic outcomes in the face of increasing globalization. For two fundamental reasons, though, the framework is inadequate for understanding the range of motivations that drive investment patterns.

First, because the framework focuses on the motivation for initial investment, it ignores the dynamic nature of these investments, including the evolution of capabilities at foreign production sites and the ability of parent firms to re-shape foreign investments to meet changing strategic goals. By placing too much emphasis on initial motivations for investment, conventional approaches overlook that once in place, investments can and do evolve and take on new roles in a firm's production system. For example, market-seeking investments, such as those made in the automotive sector in Canada in the 1950s and 1960s, can later provide cost-cutting possibilities if production structures evolve in such a way that cost or productivity differentials between home and host plants are generated over time. Similarly, attractive sites for cost-cutting investment, like Spain and Portugal in the 1970s and 1980s or central and eastern Europe today, are often poised for rapid increases in manufacturing wages, making it likely that the cost advantages will attenuate over time,

[4] See Cline, 1997; Appendix A.

perhaps rapidly.[5] As wage advantages abate, foreign affiliates in these areas must mature into roles beyond low-cost assembly sites to thrive or even survive.[6]

In addition, the framework gives too little play to the full range of pressures facing firms and the strategic responses available to them. By focusing on benefits associated with investment in host countries, the framework overlooks the importance of domestic markets as a source of competitive pressures on firms and domestic restructuring as a possible response to these pressures. In other words, the markets-versus-costs framework pays too little attention to the advantages of multi-national production *per se*. In particular, the framework underestimates the ability of multi-national firms to use international production to simultaneously meet cost-cutting and market-seeking objectives, an ability that derives from the singular capabilities that arise when decisions about production, distribution, and trade are all made by one actor. With this concentration of power, the firm can use international production as a tool to achieve a variety of goals, including the restructuring of domestic production and employment.[7] When viewed this way, production and employment effects on the home and host countries cease to be simply outcomes of internationalization patterns but also reflect strategic goals that themselves shape decisions about when, where, and what to produce outside the home country.

A perspective that includes the firm is both more realistic and more robust than one that focuses solely on supply or demand advantages offered by host countries. It recognizes that firms must compete in domestic as well as foreign markets; that they are embedded in a set of domestic institutional structures that shape competitive pressures and strategic possibilities; and that when faced with increasing competitive pressures, firms weigh internationalization against available domestic responses and choose foreign production only when and where it is more attractive. Because the range and feasibility of domestic responses are shaped by institutional arrangements and labor market conditions, internationalization patterns of firms will be shaped both by the national origin of firms and the particular conditions in the period under examination, as both will influence the pressures, constraints, and opportunities that shape the strategic calculus of firms.[8]

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[5] See Kurz and Wittke, 1998 on central and eastern Europe.
[6] See Kurz and Wittke on temporary nature of wage advantages.
[7] Kurz and Wittke, 1998.
[8] See e.g., Soskice, 1991 on how national institutions and markets create coherent systems which shape firm behavior and the range of strategic responses; see e.g., Berg, 1994 on links between national occupation and training systems and the ability of firms to create flexible employment systems in the auto industry; see e.g., Hotz, 1982 on industrial relations systems and technological upgrading.

Still, because the markets versus costs framework is useful for predicting the effects on home and host labor forces and the relative power of governments to effect change, the framework should be improved to include a more realistic, robust notion of the firm rather than scrapped altogether. Because the motivations, effects, and policy options associated with each type of investment are radically different, the effects of internationalization on national economies will be determined in part by the type of investments undertaken by domestic firms. Examples of pure market-seeking and cost-cutting investments, of course, exist and examples of "mixed motive" investments abound. For the sake of understanding recent changes in national economies, it is important to understand whether there has been a shift in the relative number of each type of investment and which pressures on firms have initiated these changes.

The Case

In this paper, I review internationalization patterns of American auto firms over the past three decades, the patterns and motivations behind these investments, and their effects on domestic employment and wages. I attempt to show how internationalization has evolved from market-seeking investment aimed at accessing autonomous national markets in the 1960s and early 1970s to a system in the 1980s and early 1990s in which regional markets came to predominate and foreign investment was more likely to be geared towards strategic goals other than market access, such as reducing costs or shifting capacity from less to more productive sites. This shift has significant implications for the effects of international production on domestic workers. Although employment at American auto affiliates was actually higher in 1960s and 1970s, these investments were primarily market seeking, strategies were independent of supply condition in the home country, and investments had little effect on domestic workers.[9] Today, foreign production is more likely to more likely to be aimed at cutting costs; pressures that generate these investments are likely to be found in domestic conditions; and these investments are more likely to reduce employment opportunities of workers in the home country.

This change has different implications for low- and high-wage economies. Among low-wage economies such as Spain in the 1970s and Mexico in the 1980s, market potential alone was not enough to attract investments by automakers. In both cases, the ability of firms to use these sites as low-cost export bases from which to serve other, higher-cost markets in the region provided an important incentive for investments. And although today the sheer

promise of some emerging markets such as China appears to provide sufficient host governments enough leverage to force automakers to commit to local production, the auto case suggests the investments that will survive over the long-term will be those that develop (low-cost) export capabilities.

Surprisingly, the automobile case suggests that firms also utilize high-wage countries in regional cost-cutting strategies. Here, wage rates play a negligible role. Instead investment in these countries is undertaken because institutional factors and labor market conditions make production more competitive than in the home country and geography and/or tariff arrangements make it feasible to export from these sites. Thus, at least in the case of autos, growing internationalization has been accompanied by increased importance of national production conditions and thus the latent power of states to shape firm production patterns.[10]

Between the 1960s and the 1990s, then, domestic institutions and production conditions have became increasingly important factors in shaping the level and patterns of internationalization within North America and Europe. Although automakers still pursue some strictly market-seeking investments, most recently in promising Asian economies like Vietnam and China, within the two major regions automakers increasingly use their power to shift production to areas like Mexico and Spain that offer more competitive production environments.[11] Although internationalization patterns and motivations may shift again as firms respond to recent changes in the operating environment—e.g., growing overcapacity, the current crisis in Asia, the potential of central and eastern Europe for low-cost production, and the emergence of Brazil as a laboratory for new production techniques--the growing importance of investment aimed at increasing competitiveness rather than accessing markets marks an important shift in the internationalization of American automotive firms over the past three decades.

The remainder of the paper is organized as follows. In Section 2, I present a brief review of international production by American auto firms since the 1960s. In Section 3, I examine closely the strategies and patterns of production within North America and in Section 4, examine the effects of these strategies on workers in the U.S. In Section 5, I compare the organization of American automakers in North America and Europe to see if there are

[9] Throughout the paper, "domestic" is used to identify workers or institutions in the home country.
[10] I use the term "latent" because the existence and potential importance of this power seems to be underestimated by states. Instead, governments in both emerging and advanced nations have focused on their ability to attract foreign investment with e.g., financial incentives, rather than on their power to shape or re-shape internationalization strategies of domestic firms.

common factors that have shaped production by American automakers in each region. Finally, in Section 6, I offer some conclusions about motivations and strategies in international production.

II. Internationalization of the Auto Industry Since the 1960s

Fueled by growing markets outside the U.S, distinct national consumer preferences and government regulations, international investment by American auto firms grew rapidly during the 1960s and early 1970s.[12] Employment at affiliates grew by from 430,000 to 730,000 during the period, with most of the gains realized at affiliates in Europe and Latin America.[13] In both regions, investment during this period was market-seeking aimed at selling in countries that could not be accessed through trade. Although large economies of scale militated against production outside the U.S., automakers were forced to establish production sites in both Europe and Latin America in order to capture new markets. In Europe, the existence of relatively high tariffs for imports into the EEC, coupled with distinct national consumer preferences, favored the establishment of affiliates to produce for local markets.[14] Despite small individual markets in Europe and low tariffs for intra-EEC trade, in the mid-1960s almost 70 percent of affiliate production was sold in domestic markets, with the vast majority of the remaining output sold to consumers in other European countries.[15]

In Latin America throughout the 1960s and 1970s, national governments imposed a variety of regulations including local content requirements, tariffs, and import restrictions, aimed at increasing production in the automobile sector. Although these restrictions were often viewed as burdensome by foreign auto companies, the perceived need to access growing markets in Latin America and the fear that future access would be restricted to established companies, provided host governments with enough leverage to impose these requirements.[16] In return, automakers acquired access to new, potentially high-growth markets that promised high prices and profits. During this period, investment by American auto firms in Latin America was strictly aimed at accessing domestic markets; in the mid-1960s, almost 95 percent of output was sold to local consumers.[17]

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[11] See Sturgeon, 1998 on recent market-seeking investments by U.S. automakers.
[12] Throughout this paper, "affiliates" refers to majority-owned plants located outside the home country.
[13] See U.S. DOC, 1971 and 1981.
[14] See Maxcy, 1981.
[15] US DOC, 1971.
[16] See Jenkins, 1977 and Bennett and Sharpe, 1979.
[17] US DOC, 1971.

As the data in Table 1 show, despite relatively high domestic content requirements, affiliates in Latin America absorbed a significant amount of exports from U.S. firms. In 1977, exports to these affiliates were over $1 billion and coupled with almost no corresponding imports, resulted in a large positive trade balance with Latin American affiliates. (See Table 2.) European plants during this period, though, were largely autonomous and trade between U.S. parents and affiliates was very low throughout the period. Exports from the U.S. to European affiliates accounted for less than two percent of affiliates sales in both 1966 and 1977 and imports from these plants never comprised even three percent of their output.[18] (See Table 3.) Parents and affiliates served distinct markets and U.S. parents only sparingly used European affiliates as distributors of domestically-produced goods or sources of components or vehicles for the U.S. market.

Internationalization in the auto sector in the 1960s and 1970s, then, bore the typical characteristics of market-seeking investment: patterns were driven by the search for markets combined with regulatory requirements (in Latin America) and distinct national consumer preferences (in Europe) which required local production. In the absence of investment, American automakers could not have sold many vehicles in these markets and so investment did not the displace home production or employment but instead stimulated modest export growth. (See Tables 1 and 2.) Thus, despite growing investment and employment at affiliates abroad, international production during this period probably had slightly positive effects in terms of employment and wages in the U.S. labor market.

[18] U.S. Department of Commerce, 1971 and 1981.

Table 1. U.S. Trade With Affiliates
(in million current dollars)

Exports to Affiliates

	Total	Canada	Europe	Latin America	Mexico	Other L.A.	Other
1966	1,696	1,299	96	198	na	na	103
1977	11,650	9,987	442	1,020	na	na	201
1982	13,642	11,560	417	1,504	na	na	161
1989	27,455	22,702	884	3,600	3,410	190	269
1995	37,249	28,137	1,948	6,874	6,211	664	289

Imports from Affiliates

	Total	Canada	Europe	Latin America	Mexico	Other L.A.	Other
1966	1,112	948	145	6	na	na	13
1977	8,934	8,207	524	176	na	na	27
1982	11,684	10,869	158	529	na	na	128
1989	27,419	22,728	1,130	3,480	3,220	260	81
1995	43,953	32,890	2,724	8,270	8,126	144	69

Source: U.S. Department of Commerce (various years)

Table 2. Balance of Trade With Affiliates, 1966-1995
(in millions of current dollars)

	All	Canada	Europe	L.A.	Other
1966	+584	+351	-49	+192	+90
1977	+2716	+1780	-524	+844	+616
1982	+1958	+691	+259	+975	+33
1989	+36	-26	-246	+120	+188
1995	-6704	-4753	-776	-1395	+220

Source: U.S. Department of Commerce (various years). Calculations by author.

Table 3. Intra-firm Exports and Imports As a Percent of Affiliate Sales

Exports to Affiliates

	1966	1977	1982	1989	1995
Total Non-Canada	7.6%	5.4%	5.6%	6.7%	8.0%
Europe	1.9%	1.7%	1.7%	1.6%	2.2%
Latin America	19.4%	19.8%	20.0%	36.5%	34.4%
Mexico	--	--	--	53.6%	52.8%
Other Latin America	--	--	--	3.7%	7.5%
Other	8.1%	6.0%	3.2%	4.2%	5.5%
Canada	33.6%	58.8%	64.2%	57.1%	53.9%
Total	15.2%	24.3%	24.7%	24.8%	22.5%

Imports from Affiliates

	1966	1977	1982	1989	1995
Total Non-Canada	2.2%	2.4%	2.2%	6.6%	9.8%
Europe	2.9%	2.3%	0.6%	2.1%	3.1%
Latin America	0.6%	3.4%	7.0%	35.3%	41.3%
Mexico	--	--	--	49.7%	69.1%
Other Latin America	--	--	--	7.5%	1.6%
Other	1.0%	0.8%	2.6%	1.3%	1.3%
Canada	24.6%	48.3%	60.4%	57.2%	63.0%
Total	10.0%	18.7%	21.2%	24.7%	26.6%

Source: U.S. Department of Commerce (various years). Calculations by author.

The Rise of the Region

Although production and sales were mostly organized around national markets in the 1960s, during this decade the first steps were made toward integrating trade and production across borders. In 1965, the US and Canada signed the Auto Pact, eliminating tariffs on components and vehicles and *de facto* creating one product market in automobiles for North

America. This pact stimulated trade between the countries, which rose rapidly in the subsequent years.[19]

Also in the late 1960s, Ford of Europe was created with the intention of taking advantage of falling tariffs within the European Union and was a step toward organizing production along regional rather than national lines.[20] Both the Auto Pact and the creation of Ford of Europe, though, are more significant for creating broad structures that would later facilitate the implementation of regional strategies than for their immediate effect on production, which remained strongly tied to national markets through the 1960s and early 1970s.[21] These structures would facilitate cross-border production and trade as the automakers responded to the worldwide collapse in demand and the saturation of developed markets in the late 1970s and early 1980s

The plunge in vehicle demand in the late 1970s spurred further integration of North American production as Canadian affiliates became increasingly important suppliers to the U.S. market. Between 1977 and 1982, the Big 3 closed domestic plants but left Canadian production capacity intact and used these plants to meet U.S. demand. During this period, the proportion of Canadian production sold in the U.S. market increased from 48 to 60 percent. (See Table 3.) As the crisis passed in the early 1980s, automakers continued to use lower-cost Canadian plants to meet resurgent domestic demand rather bring additional domestic assembly capacity on-line.[22] In Europe, the drop in demand and saturation of markets in the north raised competitive pressures and stimulated a search for new markets, factors that encouraged American auto investment in southern Europe in the late 1970s and early 1980s.

By the mid-1980s, international production of American auto firms was composed of two major regional blocs, one in Europe centered around plants in Germany, the UK, and Spain; and the other in North America involving plants in Mexico, Canada, and the U.S. Despite some cooperation between North American and European operations in vehicle design and a

[19] There were still, though, restrictions on the use of Canadian plants; the pact included commitments from the Big 3 to not lower the amount of vehicle production and to achieve a Canadian value added of 60%. See Herzenberg, 1996.
[20] Dunnett, 1980; Maxcy, 1981.
[21] The relationship, though, weakened between the mid-1960s and mid-1970s. As shown in Table 2, between 1966 and 1977, the value of exports increased from 34 to 59 percent of Canadian affiliate sales and imports rose from 25 to 48 percent of sales. In Europe during this period, sales to local markets fell from 69 to 57 with trade between European affiliates (rather than with U.S. parents) making up for most of the decline in local sales. Unfortunately, data are available only for 1966 and 1977, so it is impossible to get a more specific chronology of the rise in regional trade.
[22] Holmes, 1993.

recent push to coordinate component purchasing internationally, the two blocs remain largely independent and there is little trade between the blocs.[23] Although there are a number of smaller national and regional production sites in South America, Asia, and Oceania, the vast majority of production and employment by American auto firms is located in North America and Europe.

The rise of the region as the unit of production and sales is reflected in cross-border integration of production, growing inter-affiliate trade, and the rise in trade in inputs rather than just finished vehicles. In 1977, intra-firm trade accounted for only 33 percent of sales and the majority of exports from the U.S. to affiliates was in finished goods. By the late 1980s, trade with other affiliates accounted for almost half of all sales and the majority of intra-firm trade was in production inputs, with finished goods accounting for only 25 percent of U.S. exports to affiliates.[24] (See Table 4.)

Today, purely market-seeking investment is a small portion of international production and is concentrated in promising markets like India, China, and Russia. These investments are driven by the need for new growth markets; state policies that promote local production; and the belief that building cars locally fosters customer allegiance.[25] Unlike investments in countries like Poland or the former east Germany, where automakers hope to develop low-cost sites from which to serve existing markets in western Europe, labor costs play almost no role in automakers' investment decisions. Although labor costs in these locations are very low compared to those at other auto-producing sites, firms usually pay wages that are well above the prevailing market rate for manufacturing workers.[26] These investments pose no (immediate) threat to workers in high-wage countries and may even stimulate some home demand for management and design services and components: most production is for local markets with the remainder destined for other emerging economies where there is also demand for the smaller, cheaper vehicles produced at these sites.[27]

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[23] See Sturgeon, 1997 on recent attempts to coordinate purchasing and design globally. The separateness of the two regions is perhaps best illustrated by the limited success of the first "world car" strategy; Keller (1986) notes that in the mid-1980s, Ford Escorts sold in North America and Europe had only one common component and only 16 that were interchangeable between the two models.

[24] See Table 4. Data on the proportion of exports that is in finished goods are from 1989. See U.S. DOC, 1981, 1992. Unfortunately, data are not available on the proportion of European affiliate trade that is in production inputs rather than finished goods.

[25] Surgeon, 1997.

[26] See Sturgeon, 1998; also Field Notes and Surveys, Globalization and Jobs Project, 1998.

[27] Meredith, 1997; The Economist, 1997.

Table 4. Destination of Affiliate Sales: 1977, 1982, 1989, and 1995

	1977	1982	1989	1995
(1) Local sales	61%	59%	54%	49%
(2) Sales to U.S.	19%	21%	24%	26%
(3) Sales to U.S. parents	18%	20%	24%	25%
(4) Sales to Foreign Countries	20%	22%	22%	26%
(5) Sales to Non-U.S. Affiliates	15%	18%	19%	22%
(6) Total intra-firm sales = (3)+(5)	33%	38%	43%	48%

Source: U.S. Department of Commerce (various years); calculations by the author.
Total in (6) may not sum to (3) + (5) because of rounding.

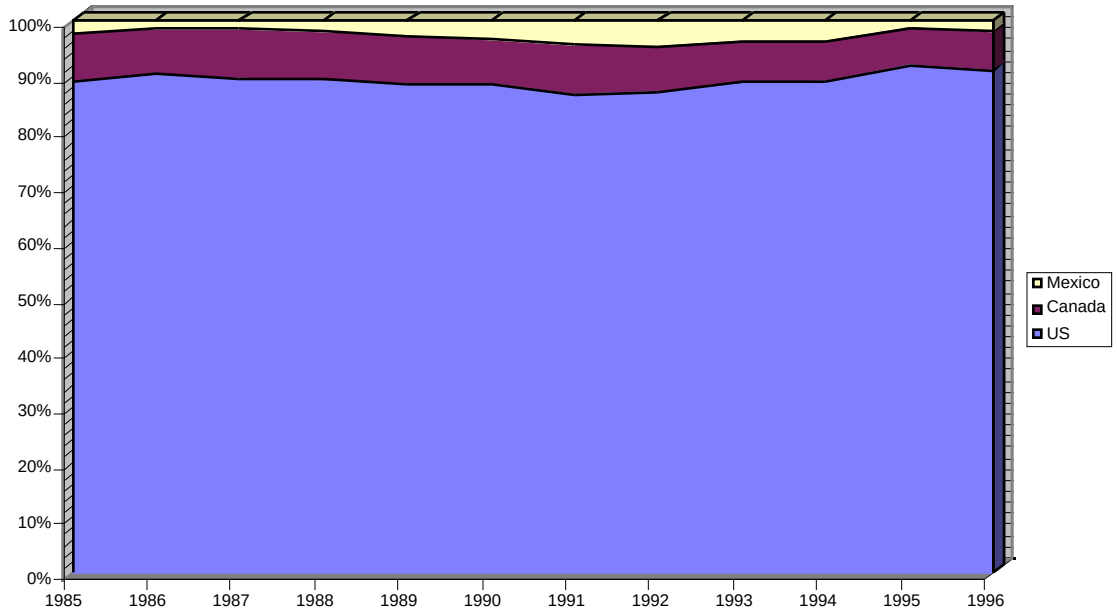
III. The North American Production System

Despite a decline in worldwide employment at affiliates since the early 1980s, employment at affiliates in North America has increased and due to rising imports from Mexican and Canadian affiliates, intra-firm trade has grown steadily. During the 1980s, driven largely by investment from American firms, the Mexican auto sector became an important supplier of components and then vehicles to the U.S. market. The rapidity and depth of the transformation of the Mexican auto industry is without precedent. In the early 1980s, exports from affiliates to the U.S. were only ~$500 million and the Big 3 had not yet shipped a car from Mexico for sale in the U.S. market. By 1995, exports neared $7 billion; almost 70 percent of affiliate production was sold in the U.S.; and the Mexican auto sector exported a higher percentage of vehicles produced than any country in the world.[28] Imports from Canadian affiliates have also increased since the early 1980s and have grown much more rapidly than exports, a trend that gained momentum in the 1990s. Between 1989 and 1995, imports increased by over $10 billion and the trade deficit with affiliates increased by almost $5 billion. By 1995, over 60 percent of output from Canadian affiliates was sold in the U.S. market, a higher proportion than in any year for which there are data. (See Tables 1, 2, and 3.)

[28] See Table 2. EIU, 1989 reports that in 1981, none of the Big 3 exported a vehicle from Mexico; in 1986, Chrysler and GM both exported well under 20,000 vehicles from Mexico and Ford exported none. Each of the Big 3, though exported more than 145,000 vehicles in each of 1995 and 1996, with Chrysler exporting more than 300,000 in 1996 (calculated from sales and production data presented in EIU, 1997a).

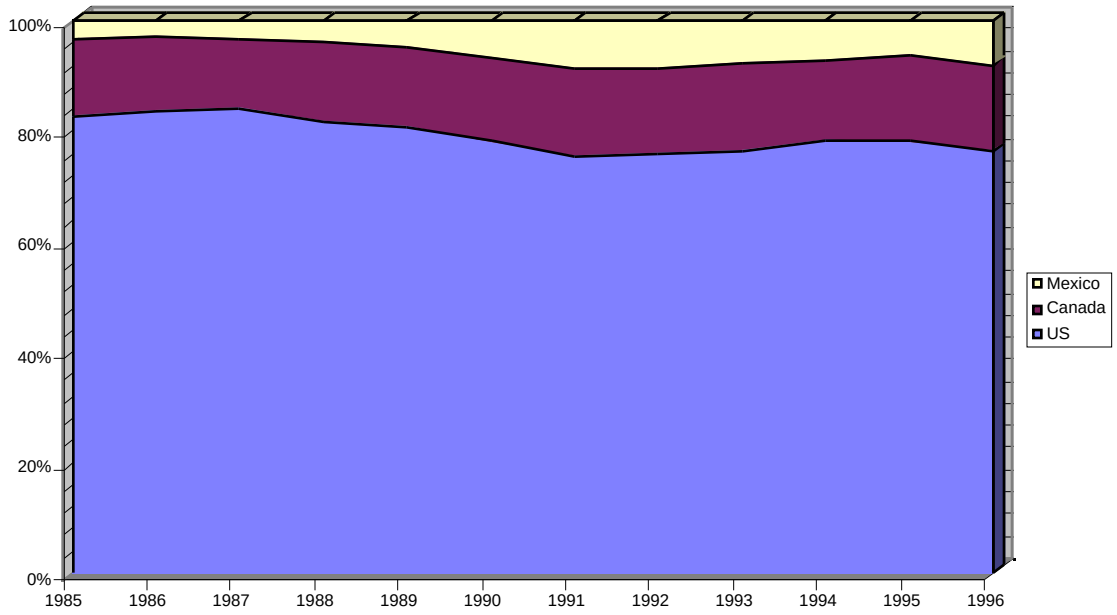
The strengthening of regional production networks in North America has been marked by a weakened relationship between national demand, i.e., vehicle sales, and national supply, i.e., vehicle production, as demand in one country is easily filled by vehicles produced in another country in the region.[29] Over the past decade, this has resulted in a declining share of vehicle production that occurs at U.S. plants despite a growing share of regional sales: in 1985, 89 percent of North American sales and 83 percent of production were in the U.S; by 1996, 91 percent of sales were to U.S. consumers but only 77 percent of vehicles were produced in the US.[30,31] In Mexico and Canada, predictably, the result has been just the opposite--production in both countries has soared over the past decade despite stagnant sales. (See Figures 1 and 2.) These trends pre-date the NAFTA, which in autos has served largely to codify existing arrangements and accelerate the integration promoted by government decree, most significantly the liberalization of the Mexican industry with the 1989 Auto Decree.[32]

Figure 1. NAFTA Vehicle Sales, 1985-1996



[29] This is common to regional arrangements; see Strange, 1997 on trade-creating and trade-diverting aspects of regional blocs (p. 39).
[30] For 1996, each percentage point of production represents approximately 150,000 vehicles.
[31] These numbers actually understate the intra-regional shift in assembly at Big 3 plants--had Japanese transplants not dramatically increased production in the U.S. over the past decade, the gap between domestic sales and production would have grown more quickly.
[32] See e.g., Studer 1996. Studer notes, too, that NAFTA provides the framework for future integration as it "has assured a transparent regulatory framework for the firms to be able to design their long-term competitive strategies for the region" (p. 62).

Figure 2. NAFTA Vehicle Production, 1985-1996



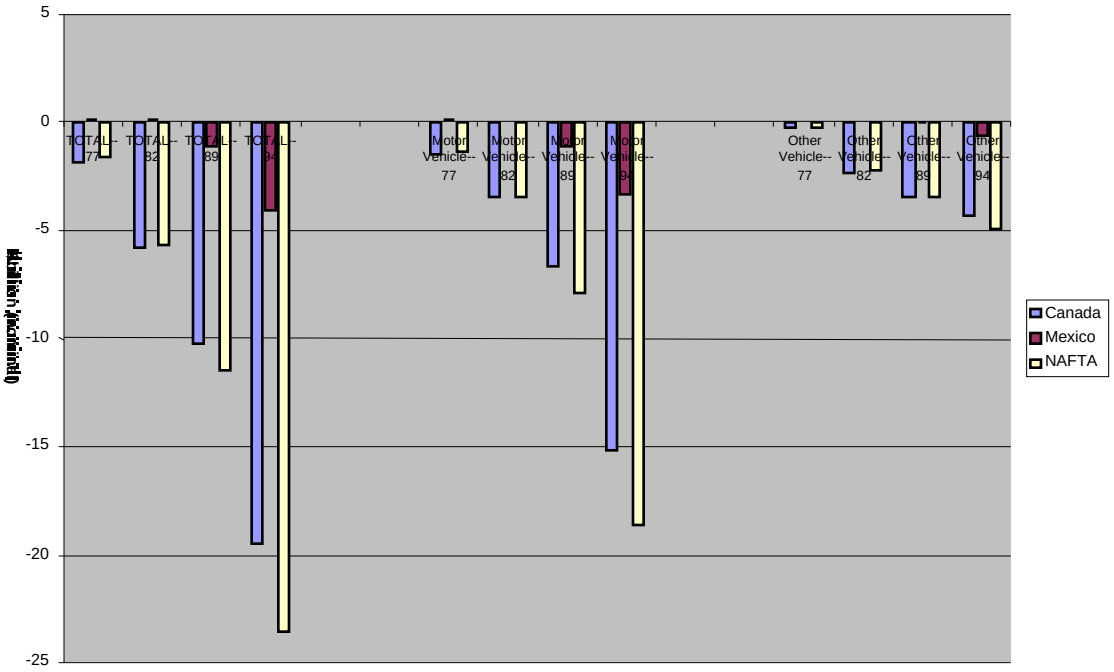
Source: EIU, 1997a

The shift of assembly activity within North America is the result of increased use of Canadian and Mexican affiliates to assemble vehicles for the U.S. market. By the mid-1990s, Big 3 assembly plants in Canada were producing more than twice as many vehicles as they sold locally and in Mexico, three vehicles were produced for each one sold in the Mexican market.[33] The remainder of the vehicles produced at these affiliates were sold in the U.S. market, resulting in increased vehicle imports and a trade deficit with Canada and Mexico that has increased steadily since 1982.[34] (See Figure 3.)

Rising imports of vehicles from affiliates coincide with a decline in assembly employment in the U.S. auto sector--vehicle assembly as a proportion of total jobs in the auto sector declined from ~37 percent in the mid-1980s to ~30 percent in 1995.[35] Although productivity increases in vehicle assembly can explain a large portion of the decline in

[33] Industry Canada, 1998; EIU, 1998.
[34] Trade data taken from UN, various years.
[35] U.S. BLS, various years.

Figure 3. U.S. Vehicle Trade Balance within NAFTA Region, 1977-1994



Source: UN, various years.

assembly jobs, the shift in assembly activity to affiliates in Canada and Mexico can account for up to one-quarter of the decline in assembly employment.[36] Moreover, as the Canadian experience shows, productivity increases and employment stability are compatible: since the late 1980s, productivity in vehicle assembly has grown more rapidly and is now higher than at U.S. plants yet assembly employment has been remained constant since the mid-1980s.[37]

Despite a falling share of regional assembly activity, U.S. production and employment in auto parts has grown steadily.[38] (See Figure 4.) Most of this growth has been realized since the

[36] I calculate this in the following way. I assume that one-half of the 1985-1996 Canadian production increase and two-thirds of the Mexican production increase is attributable to sales in the US market. Using an estimate of 3.23 workers per vehicle for the U.S. in 1996 (estimate from the 1997 Harbour Report as reported in Industry Canada, 1998), I calculate that the number of assembly jobs associated with these imports is ~9500, which is approximately 25% of the 40,000 decline in U.S. assembly employment reported by the U.S. Bureau of Labor Standards. (See Employment and Earnings, various years.)

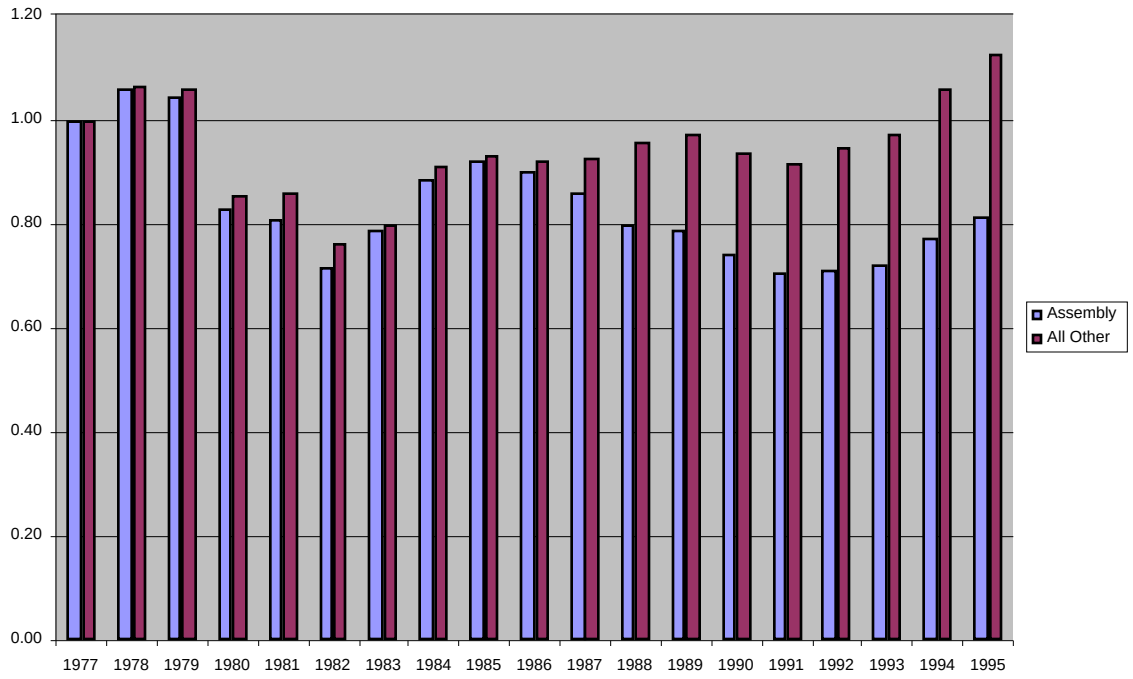
[37] See Industry Canada, 1998.

[38] Employment data include assembly and parts sectors and are taken from Employment, Hours and Earnings, U.S. Department of Labor, various years. Throughout this paper, the automotive parts and components sector is defined as automotive stampings (SIC 3465); carburetors, pistons, and valves (SIC 3592); vehicular lighting equipment (SIC 3647); engine electrical equipment (SIC 3694); and motor vehicle parts and accessories (SIC 3714), which is mostly engine, drive train, and brake production.

early 1990s and has been driven largely by strong consumer demand; increased localization of vehicle assembly and parts purchases by Japanese transplants; and the on-going transfer of production and design responsibilities from assemblers to their major suppliers, a trend that will not change the overall employment in the sector but will shift the distribution of jobs away from the assembly sector towards the supply sectors.[39]

Strong consumer demand and growing localization at transplants have also contributed significantly to the recent surge in employment in the parts sector. Between 1991 and 1996, vehicle production in the U.S. rose by 2.9 million, with over one-quarter of the growth occurring at transplants, and transplant parts purchases more than doubled, rising from $10.5 to almost $23 billion.[40] Because productivity growth in the sector has been slow, the increase in demand for parts has stimulated an almost proportionate increase in employment. (See Figure 5.)

Figure 4. Employment in Assembly and Parts, 1977-1995



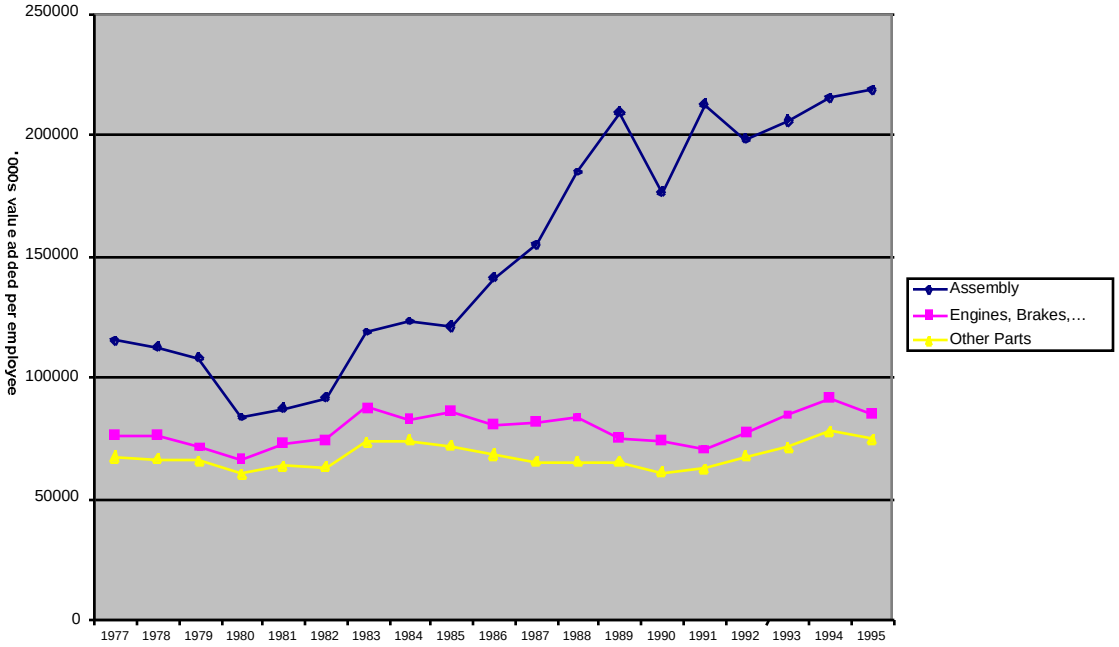
Source: U.S. Department of Labour, 1994 and 1996

Storage batteries (SIC 3691) are not included because a portion of the output goes to non-automotive sectors.

[39] See Sturgeon, 1997 on growing "modularization" in the industry.

[40] Transplant vehicle production data for 1987-1991 from JAMA, 1993; transplant vehicle production data for 1992-1996 from Ward's, 1997; and information on parts purchases from JAMA, 1997. Growth in parts purchases is the result of both rising levels of vehicle production and an increase in local parts purchases per vehicle produced, which rose from $6360 in 1992 to $8184 in 1996. See U.S. Department of Commerce

Figure 5. Productivity in Assembly and Parts, 1977-1995 (in $1992)



Source: U.S. Department of Commerce, 1992 and 1996.

A reduction in the trade deficit in parts from $10.1 to $6.5 billion between 1985 and 1996 has also contributed to growth in the parts sector. Although much of the growth in parts production and employment can be traced to increased purchases by Japanese transplants, a portion is attributable to a U.S. trade surplus in parts within North America. Fueled by particularly strong export performance in engines and other high valued-added parts, mostly to meet demand in the growing assembly sector, the U.S. trade surplus with Canada in parts has risen by $10 billion since the late 1980s.[41] (See Figure 6.)

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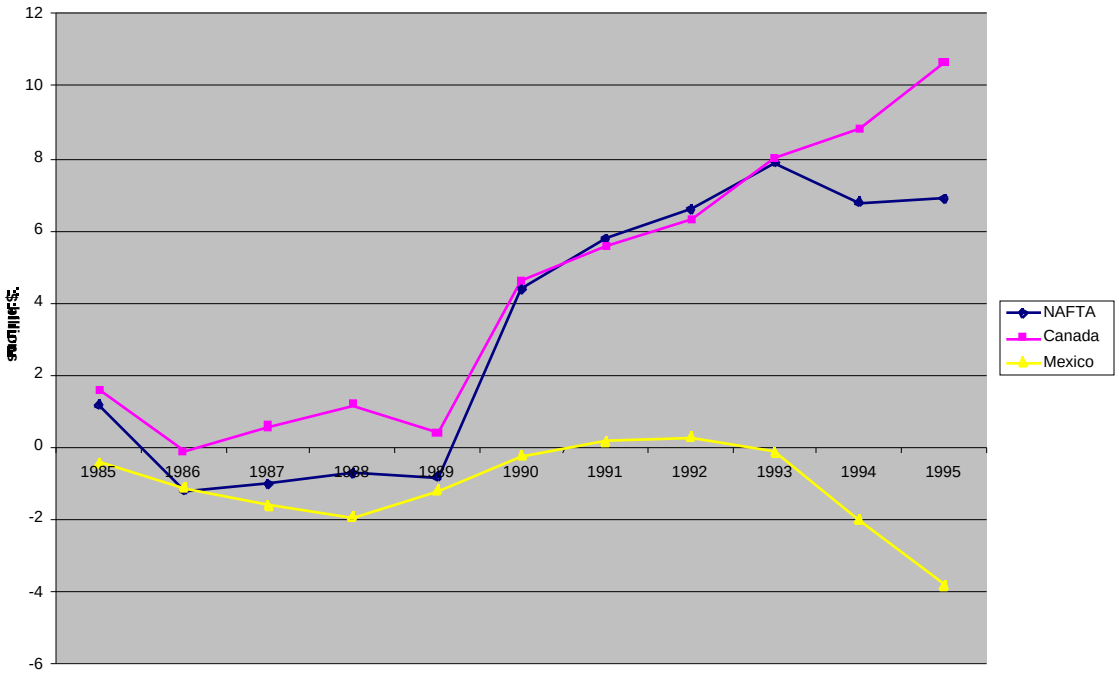
and The Office of the U.S. Trade Representative, 1997.

[41] Between 1989 and 1995, a $3.8 billion deficit in this sector (SIC 3714) was transformed into a $3.4 billion surplus a transformation that accounts for ~17% of the growth in sales during this period. For trade numbers by SIC, see Trade and Employment, U.S. DOC (various years). It is uncertain, though, whether the increase in exports reflects comparative advantage or is due simply to the shift in assembly from the U.S. to Canada, which necessitates more cross-border trade to meet currently high regional demand. Herzenberg, 1996 suggests it's the latter.

Figure 6. U.S. Balance of Trade in Auto Parts within NAFTA Region, 1985-1996



Source: U.S. ITA, 1996.

The trade surplus with Canada has been partially offset by a growing deficit with Mexico which driven by a surge in electronics parts imports, reached $4 billion in 1995.[42] The bulk of parts imported from Mexico utilizes vast quantities of low-skilled, assembly-type labor and much of this trade is administered under production-sharing provisions which exempt the value of U.S. components when assembled goods are re-imported. These arrangements, it is believed, allow U.S. firms to maintain competitiveness by accessing low-cost foreign workers for labor-intensive portions of production and are used extensively by firms in the auto sector.[43]

Data on production sharing provide a snapshot of the nature of U.S.-Mexico trade in auto parts and a glimpse at the role of Mexican plants in North American parts production.[44] As the data in Table 5 show, automotive imports from Mexico tend to have very high U.S. content, ranging from about 40 percent for engines, motor vehicles, bodies, and chassis to 63

[42] U.S. ITA, 1996.
[43] U.S. ITC, 1996.

Table 5. Production-Sharing in the Auto Sector

	Percent of Mexican imports involving production sharing	US content (%)
Motor Vehicles	95	39
Engines	24	40
Ignition Wire Harnesses	90+[1]	60
Other[2]	na	63

[1] Estimate based on information provided in U.S. ITC, 1996.
[2] Imports classified by U.S. ITC as "certain motor vehicle parts."

Source: U.S. ITC, 1996

percent for miscellaneous parts for motor vehicles. The U.S. content of ignition wire harnesses, which make up a large portion of parts imports, is just over 60 percent. These data suggest that Mexican electronics and non-engine parts plants, many of which are owned by the Big 3 or their major suppliers, perform unskilled, labor-intensive tasks, a picture consistent very low education levels of workers in the Mexican parts sector and the low value-added per worker reported by Mexican affiliates.[45,46]

IV. Effects on Domestic Employment and Wages

As the data in the previous section show, over the past decade Canadian and Mexican affiliates have become more tightly integrated with U.S. production as automakers have developed a complex regional structure aimed at utilizing capabilities in each country. At the same time, trade with affiliates outside North America has not changed appreciably, remaining at the levels of the 1960s and 1970s, when consumer demand and government regulations combined to create distinct national markets. These patterns suggest that at least

[44] Because it is possible that some automotive imports from Mexico have U.S. content yet are not registered under production-sharing arrangements, these data provide a lower-bound estimate of the proportion of U.S. content in imports from Mexico.
[45] Eden *et al*., 1996 report that 74% of workers in the parts sector in Mexico have the equivalent of a 6th grade education or less (p. 21).
[46] In 1994, Mexican plants owned by U.S. firms in the automotive sector had an average value added per

in the auto industry, the effect of international production on domestic labor is shaped only by the organization of production within the region. It also suggests that within the North American region, cost-cutting strategies are much more important today than they were even one or two decades ago.

Based on production and trade patterns, a relatively complex picture emerges the effect of regional integration on the composition of production in each of the North American countries. (See Table 6.) Within North America, Mexico is at once an important site for low-skilled, labor-intensive production; has export capabilities in engines; and has emerged as an important source of assembled vehicles. The multiple roles that Mexico plays within regional production suggest that the intra-firm division of labor cannot be simply read from the relative income levels, wages, or education levels of workers in a country. Instead, the composition of production reflects the broad mix of capabilities within each county as brought in service to the needs of auto firms.

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worker of $14,200 compared to $102,200 in U.S. plants. See U.S. DOC, 1995.