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U.S. Multinational Services Companies: Effects of Foreign Affiliate Activity on U.S. Employment

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Abstract

This working paper examines the effect that U.S. services firms' establishment abroad has on domestic employment. Whereas many papers have explored the employment effects of foreign direct investment in manufacturing, few have explored the effects of services investment. We find that services multinationals' activities abroad increase U.S. employment by promoting intrafirm exports from parent firms to their foreign affiliates. These exports support jobs at the parents' headquarters and throughout their U.S. supply chains. Our findings are principally based on economic research and econometric analysis performed by Commission staff, services trade and investment data published by the Bureau of Economic Analysis, and employment data collected by the Bureau of Labor Statistics. In the aggregate, we find that services activities abroad support nearly 700,000 U.S. jobs. Case studies of U.S. multinationals in the banking, computer, logistics, and retail industries provide the global dimensions of U.S. MNC operations and identify domestic employment effects associated with foreign affiliate activity in each industry.

Keywords

services companies, employment, multinational companies, foreign affiliates, labor market

Comments

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U.S. International Trade Commission

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August 2011

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CONTENTS

	Page
Abstract	i
Introduction	1
1: Estimation of Employment Effects	3
Domestic employment effects	6
2: Banking Services	15
Summary	15
Industry overview	15
Operations of Multinational Banks and Links to Employment	18
3: Computer Services	23
Summary	23
Overview	23
Employment in computer services	26
Effects on multinational's foreign activities on U.S. employment	27
Conclusions	31
4: Logistics Services	33
Summary	33
Industry overview	33
Operations of MNCs in the logistics industry	36
International operations of logistics services providers	36
Overall employment trends	37
International employment	38
Employment in the United States	39
Employment at firms that rely on logistics networks	42
Conclusion	42
5: Retail Services	45
Summary	45
Overview: An increasingly international business	45
Employment in the retail industry	48
Operations of multinational retailers and U.S. employment	52
Directions for future research	55
Conclusion	57

	Page
Bibliography	61
Appendix	71
Boxes	
1 Relationship between cross-border services exports and affiliate sales	9
2 Domestic employment requirements matrixl	13
3 Employment categories for courier and messenger service providers	34
4 Contingent workers, independent contractors and FedEx	40
5 Proctor & Gamble expands global sales through Wal-Mart	56
Figures	
1 Intrafirm exports of intangible intellectual property, by type, 2009	11
2 An increase in intrafirm exports drives first- and second-order employment effects	12
3 U.S. and global banking revenues, 2006–10	16
4 Regional share of global revenues, 2010	16
5 Top ten computer systems design and related services companies, 2009	25
6 Total assets of computer systems design firms, by industry of parent, 1999-2008	27
7 Employees of MOFAs of U.S. firms exceeded employment at U.S. parent companies in 2008	28
8 Global retail sales, by country group, 2004 and 2009	46
9 U.S. multinational retailers, sales by parent companies and by majority-owned foreign affiliates, 1999–2008	49
10 Growth of employment within the United States, 2000–09	50
11 Wal-Mart employment, by location, 1998–2010	51
12 Labor productivity (output per hour), U.S. supermarkets and other grocery (except convenience) stores, 1999–09	52

	Page
Tables	
1 Number of affiliates in the top 10 countries of establishment, 1999 and 2008	4
2 Value added of majority-owned foreign affiliates by industry (\$ million), 1998 and 2008	5
3 Employment in majority-owned foreign affiliates by country (thousands of employees), 1999 and 2008	5
4 Employment in majority-owned foreign affiliates by industry (thousands of employees), 1999 and 2008	6
5 Correlation matrix	8
6 Regression results	8
7 Multinational parent firms' intrafirm exports of services	10
8 Estimated number of jobs supported by intrafirm exports of services by multinational companies, 2008	14
9 Top 10 global banks by assets, 2009	17
10 Assets and foreign operations of U.S. banks among the top 25 global banks, 2009	17
11 U.S. job supported by an additional \$1 billion of banking services output, top ten industries, 2009	20
12 Employment and wages for certain occupations within the U.S. banking sector, 2002–09	20
13 Top ten computer systems design and related services companies, 2009	25
14 U.S. jobs supported by an additional \$1 billion of computer services output, 2008	31
15 Financial profile of top 4 global logistics firms, 2009	36
16 FedEx and UPS: Number of foreign subsidiaries and employees	37
17 U.S. job supported by an additional \$1 billion of courier and messenger services output, 2008	41
18 Top 10 retailers, by global retail sales, 2009	47
19 Top 10 retailers in the United States, 2009	47
20 U.S. jobs supported by an additional \$1 billion of U.S. retail output, 2008	53
A.1 Estimated number of jobs supported by intrafirm exports of services by multinational companies, 2008: detailed calculations	73

Introduction

Do the foreign activities of U.S. multinational companies (MNCs) create jobs in the United States or erode them? This question has been a focus of research and popular debate in recent years, but relatively little of this attention has been devoted to service industries.

This working paper examines how the foreign activities of multinational service firms affect employment in the United States. In chapter 1, we review some basic data on U.S. multinational service companies, then examine the relationship between these firms' foreign affiliate activities and U.S. employment. We find that domestic employment is positively correlated with such activities, and that these relationships are statistically significant. This suggests that domestic employment and foreign activity in services are complements.

Next, we present data that show how multinational parent firms and their affiliates work in concert to compete in foreign markets. We focus on the size and growth of intrafirm services trade, particularly domestic parent firms' exports to foreign affiliates. These exports support jobs at multinational parent firms' headquarters and throughout their U.S. supply chains. Using an "employment requirements" matrix developed by the Bureau of Labor Statistics (BLS) and trade data, we estimate the number of jobs thus supported. Our findings suggest that intrafirm exports of services by U.S. multinational companies support nearly 700,000 U.S. jobs.

To place these results in context, chapters 2 through 5 examine the banking, computer, logistics, and retail service industries. These sectors were selected because they feature some of the most active multinational service providers headquartered in the United States. The case studies briefly describe each industry, discuss the global dimensions of U.S. MNCs' operations, and identify the domestic employment effects associated with foreign affiliate activity.

1: Estimation of Employment Effects

U.S. direct investment abroad² by services firms (excluding holding companies) totaled \$1.4 trillion in 2008, or 43 percent of all such investment.³ U.S. service firms have invested abroad because many services require their providers to be near their consumers. Outbound investment has also been driven by firms' interest in accessing new markets—especially large emerging markets—and by regulations that prohibit cross-border trade or make residence a condition of market participation.⁴ Entering new markets is a means of leveraging the capital and intellectual property developed inside MNCs to develop new revenue streams and “brand” firms globally. Such investment has been facilitated by the liberalization of policies that prohibited or otherwise restricted foreign establishment. Services supplied by affiliates in 2008 (\$1.1 trillion) outstripped cross-border services exports (\$518 billion) by a margin of more than two-to-one.⁵

Parents of U.S. services multinationals continue to account for the majority of such firms' economic activity. In 2008, parent firms accounted for 79.4 percent of total value added⁶ by U.S. services multinationals, and 74.9 percent of employment. Yet the allocation of value added and employment within services multinationals is changing. Value added by services parent firms grew at a compound annual rate of 3.5 percent between 1999 and 2008, while employment was flat. Over the same period, value added by their majority-owned foreign affiliates (MOFAs) increased at a compound annual rate of 8.2 percent, and employment grew at a compound annual rate of 4.6 percent. Sales by MOFAs became increasingly important to services multinationals over this period: such sales climbed from 14.0 percent of service multinationals' sales in 1999 to 23.9 percent in 2008.⁷

During the 1999 to 2008 period, the top ten countries by number of MOFAs was similar, although China broke into the group and Belgium dropped out of it (table 1). Value added among MOFAs increased across all industries during the period, but growth in many service industries eclipsed that in manufacturing (table 2).

² U.S. direct investment abroad, or outbound investment, reflects investment by U.S. parent companies in foreign-based affiliate companies, where the U.S. parent owns or controls, directly or indirectly, 10 percent or more of the voting securities of an incorporated foreign business enterprise, or the equivalent interest in an unincorporated foreign business enterprise. Unless otherwise noted, this paper refers to majority-owned foreign affiliates (MOFAs), for which the combined ownership of all U.S. parents exceeds 50 percent. In 2008, majority-owned affiliates accounted for 85.2 percent of the employment of all foreign affiliates. U.S. Department of Commerce (USDOC), Bureau of Economic Analysis (BEA), *Survey of Current Business*, August 2010, 205-06.

³ Holding companies are service providers, but in many cases they hold the equity of goods-producing firms. Holding companies accounted for \$1.2 trillion in direct investment abroad in 2008. USDOC, BEA, “U.S. Direct Investment Abroad on a Historical Cost Basis,” 1997-2009.

⁴ The desire to relocate specific stages of production to lower-cost locations (“vertical” FDI) has also motivated some investments, such as those of some computer services firms in India. However, the distinction between vertical and horizontal multinational firms is rarely clear, as many firms pursue “complex integration” strategies to both access new markets and economize on production costs. Yeaple, “The Complex Integration Strategies of Multinationals,” 2003.

⁵ USDOC, BEA, “Table A. Services Supplied to Foreign and U.S. Markets Through Cross-Border Trade and Through Affiliates,” October 2010. One caveat applies to comparison of service exports and affiliate sales: BEA records cross-border trade data by the type of service delivered, but classifies the affiliate sales data by the primary industry of the affiliate (regardless of the nature of the service delivered).

⁶ Value added is “The portion of the goods and services sold or added to inventory or fixed investment by a firm that reflects the production of the firm itself” (USDOC, BEA, Operations of Multinational Companies Database, accessed June 14, 2011). We analyze value added here instead of sales because it illuminates how multinational firms distribute value-creating production processes.

⁷ USDOC, BEA, Operations of Multinational Companies Database (accessed June 21, 2011). Activities of holding companies are excluded from the calculations in this paragraph. Our calculations do not take into account any sales from foreign affiliates in which U.S. parents do not hold majority stakes.

TABLE 1 Number of U.S. majority-owned foreign affiliates, by country, 1999 and 2008

Country	1999	Country	2008
United Kingdom	2,535	United Kingdom	2,963
Canada	1,859	Canada	1,850
Germany	1,327	Germany	1,593
France	1,174	Netherlands	1,541
Netherlands	1,117	France	1,302
Mexico	802	Mexico	883
Australia	773	China	868
Italy	680	Australia	814
Japan	651	Japan	739
Belgium	542	Italy	703
Other	<u>9,582</u>	Other	<u>11,729</u>
Total	21,042	Total	24,985

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Selected Data for Foreign Affiliates in All Countries in Which Investment was Reported," 1999 and 2008.

Note: Totals exclude affiliates that were exempt from reporting requirements.

TABLE 2 Value added of U.S. majority-owned foreign affiliates by industry (\$ millions), 1999 and 2008

Industry			CAGR	Growth
	1999	2008	1999–2008	1999–2008
Manufacturing	316,300	517,133	5.6	63.5
Mining	38,552	221,006	21.4	473.3
Wholesale trade	76,774	157,274	8.3	104.9
Retail trade	14,499	53,323	15.6	267.8
Computer systems design and related services	16,166	36,824	9.6	127.8
Real estate and rental and leasing	5,630	29,041	20.0	415.8
Administration, support, and waste management	11,508	28,932	10.8	151.4
Insurance carriers and related activities	13,802	28,597	8.4	107.2
Transportation and warehousing	4,936	18,841	16.0	281.7
Finance, except depository institutions	11,490	17,885	5.0	55.7
All other	56,738	102,996	0.8	81.5
Total	566,395	1,211,852	8.8	114

Source: U.S. Department of Commerce, Bureau of Economic Analysis

The leading countries in employment by MOFAs in 2008 largely mirrored those with the largest number of foreign affiliates (table 3), and with the exception of Germany, which saw a minimal decrease, employment grew within each of those countries during 1999–2008. Further, when measured by industry of affiliate, employment growth among MOFAs in many service industries outpaced that in manufacturing (table 4).

TABLE 3 Employment in U.S. majority-owned foreign affiliates by country (thousands of employees), 1999 and 2008

Country			CAGR	Growth
	1999	2008	1999–2008	1999–2008
United Kingdom	1,060	1,174	1.1	10.8
Canada	1,004	1,064	0.6	6.0
Mexico	781	902	1.6	15.5
China	252	774	13.3	206.7
Germany	641	621	-0.3	-3.0
France	530	604	1.5	14.0
Brazil	349	486	3.7	39.3
India	62	313	19.7	403.9
Japan	207	297	4.1	43.1
Australia	253	288	1.5	14.1
All other	2,627	3,600	3.6	37.0
All countries	7,766	10,124	3.0	30.4

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Note: CAGR is cumulative annual growth rate.

TABLE 4 Employment in U.S. majority-owned foreign affiliates by industry of affiliate (thousands of employees), 1999 and 2008

Industry			CAGR	Growth
	1999	2008	1999–2008	1999–2008
Manufacturing	4,357	4,600	0.6	5.6
Retail trade	414	1,063	11.1	157.0
Administration, support, and waste management	434	873	8.1	101.0
Wholesale trade	670	797	1.9	18.9
Accommodation and food services	365	693	7.4	89.9
Computer systems design and related services	158	351	9.3	122.2
Transportation and warehousing	117	220	7.3	88.3
Mining	129	198	4.9	53.2
Insurance carriers and related activities	129	149	1.6	15.0
Internet, data processing, and other information services	(^a)	130.1	(^a)	(^a)
All other	991.9	1,049	0.6	5.8
Total	7,765.7	10,123.9		

Source: U.S. Department of Commerce, Bureau of Economic Analysis

^a Data collection methods changed significantly between 1999 and 2008, obviating calculation of growth rates for the period.

Domestic Employment Effects

A number of studies have examined the relationship between MNCs' foreign activities and employment in parent companies' home country.⁸ All but a few of these studies have focused on manufacturing, and most have used "firm-level" data (data collected from individual firms through surveys). These studies have found evidence of both complementarity and substitution between international activity and home country employment. Brainard and Riker (1997) found that among U.S. manufacturing multinationals, employment at affiliates substituted only modestly for U.S. employment, whereas substitution *among* affiliates in low-wage countries was stronger.⁹ Desai, Foley and Hines (2008) found evidence of complementarity: among U.S. manufacturing firms, they found that 10 percent greater investment abroad was associated with 2.6 percent additional investment in the United States, and 10 percent greater foreign employee compensation was associated with 3.7 percent greater U.S. employee compensation.¹⁰ The work of Harrison and McMillan (2006) yielded a more nuanced picture. They found that employment at affiliates in high-wage countries complemented U.S. employment, but employment in low-wage countries substituted for it.¹¹

Molnar, Pain and Taglioni (2008) produced one of the few studies examining services. Using industry-level data for both goods-producing and service industries, they found that a 1 percent increase in employment at foreign affiliates is associated with a 0.1-0.2 percent increase in U.S. employment in each industry after two years, if output and wages are held constant (in contrast, they found a negative effect in Japan, although the effect is not statistically significant in all models). These results were calculated for services and manufacturing industries together. The authors also investigated the impact

⁸ A comprehensive review of this literature appears in Molnar, Pain, and Taglioni, "Globalisation and Employment in the OECD," December 2008.

⁹ Brainard and Riker, "Are U.S. Multinationals Exporting U.S. Jobs?" March 1997.

¹⁰ Desai, Foley, and Hines, "Domestic Effects of the Foreign Activities of U.S. Multinationals," May 2008.

¹¹ Harrison and McMillan, "Outsourcing Jobs?" July 2006.

of outward foreign direct investment on domestic employment growth, and for these estimations they examined effects for services separately from manufacturing. They found evidence suggesting that, among member countries of the Organisation for Economic Co-operation and Development (OECD), domestic and foreign employment are substitutable in manufacturing industries with strong links to non-OECD countries, but complementary in services. Finally, Imbriani, Pittiglio, and Reganati (2010) used firm-level data from Italy to examine how “internationalization” (the change from being a purely domestic firm to having foreign affiliates) affected parents’ productivity and employment. They found that outward investment strengthened productivity and employment at manufacturing parent firms but weakened them among services parent firms.¹²

We use three econometric models to explore the relationship between foreign activity and domestic employment at U.S. multinational service firms. Our models use data from the Operations of Multinational Companies database prepared by the U.S. Department of Commerce, Bureau of Economic Analysis. The data are aggregated by industry. Our dataset includes 14 service industries¹³ for the years 1999–2008. The following equations illustrate our models. They are modified from models employed by Molnar, Pain and Taglioni.¹⁴

1. $\ln L_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln W_{i(t-1)} + \beta_3 \ln LF_{it} + \alpha_i + \gamma_t + u_{it}$
2. $\ln L_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln W_{i(t-1)} + \beta_3 \ln S_{it} + \alpha_i + \gamma_t + u_{it}$
3. $\ln L_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln W_{i(t-1)} + \beta_3 \ln FDI_{it} + \alpha_i + \gamma_t + u_{it}$

L is the level of domestic employment among U.S. parent companies in service industry i in year t . Y and W are value added¹⁵ and average wages,¹⁶ respectively, in industry i at these U.S. parent firms. The wage variable is lagged by one year. LF , S , and FDI are alternative measures of foreign activity: employment at foreign affiliates, affiliate sales, and the U.S. outward investment stock in industry i , respectively.¹⁷ These measures are highly correlated (table 5). α represents “fixed effects” that control for unobserved, explanatory factors specific to each industry. γ represents “time fixed effects” to control for factors that are specific to each year. β_0 is a constant and u is the error term. The variables are expressed in natural logarithms to facilitate interpretation of the coefficients. The value added, wage, investment stock, and affiliate sales data are adjusted for inflation.¹⁸

¹² Imbriani, Pittiglio, and Reganati, “Outward FDI and Home Country Performance,” May 13–14, 2010.

¹³ The industries are accommodation; broadcasting and telecommunications; computer systems design and related services; construction; finance (except depository institutions) and insurance; food services and drinking places; health care and social assistance; motion picture and sound recording; professional, scientific, and technical services; real estate, rental, and leasing; retail trade; transportation and warehousing; utilities; and wholesale trade.

¹⁴ Their equations use rates of change rather than levels. They also include additional lagged variables.

¹⁵ Value added is “The portion of the goods and services sold or added to inventory or fixed investment by a firm that reflects the production of the firm itself... measured as gross output minus intermediate inputs; alternatively, it can be measured as the sum of the costs incurred (except for intermediate inputs) and the profits earned in production.” USDOC, BEA, Operations of Multinational Companies Database (accessed June 24, 2011).

¹⁶ We calculated the wages by dividing total U.S. compensation costs by the total number of employees (full-time and part-time).

¹⁷ The parent company data and the data on affiliate sales and employment are aggregated according to the industry of the U.S. parent company. The data on outward investment stock are aggregated by the industry of the affiliate. The two methods of aggregation do not always yield identical results. For example, a U.S. multinational parent company might be a retailer, but it might have one or more non-retail affiliates. This distinction should be kept in mind when comparing the results generated using the outward investment variable to those using foreign employment and affiliate sales.

¹⁸ As a robustness check, we also ran the regressions with these variables expressed in nominal terms. Doing so produced no significant changes in the results.

TABLE 5 Correlation matrix

Variables	Domestic employment	Domestic value added	Domestic wages	Foreign employment	Affiliate sales	Outward investment
Domestic employment	1.000					
Value added	0.863	1.000				
Domestic wages	-0.090	0.358	1.000			
Foreign employment	0.768	0.705	0.054	1.000		
Affiliate sales	0.596	0.732	0.390	0.883	1.000	
Outward investment	0.446	0.590	0.334	0.682	0.819	1.000

Source: Compiled by Commission staff

The coefficient on value added is expected to be positive because greater output is likely to be associated with greater employment. The lagged wage variable is expected to have a negative sign because higher wage costs are likely to lead companies to employ fewer workers. The foreign activity variables will have positive signs if foreign activity and U.S. employment are complementary and negative signs if they are substitutes.

The results from our regressions appear below (table 6).

In all the regressions, the coefficient on value added is significant and positive, as expected. The coefficient on wages is negative but not significant.¹⁹ The coefficients for two of the three foreign activity variables—foreign employment and affiliate sales—are positive and significant at the 1 percent level, while the coefficient for the third, outward investment, is positive but not significant. Together, the regressions provide moderately strong evidence of a small, positive effect of foreign activity on

TABLE 6 Regression results

Dependent variable: Employment at U.S. parent companies of multinational service firms t-scores in parentheses

	1	2	3
<i>Domestic value added</i>	0.628* (6.29)	0.637* (6.42)	0.640* (6.54)
<i>Domestic wages</i>	-0.105 (-0.57)	-0.125 (-0.65)	-0.126 (-0.63)
<i>Foreign employment</i>	0.118* (3.27)		
<i>Affiliate sales</i>		0.102* (2.89)	
<i>Outward investment</i>			0.053 (1.23)
<i>Constant</i>	0.087 (0.04)	-0.295 (-0.13)	0.230 (0.10)
<i>Number of observations</i>	122	122	121
<i>Adjusted R-squared</i>	0.990	0.990	0.989

Source: Compiled by Commission staff

* 1 percent level significance

¹⁹ The wage term's insignificance may be caused by offsetting effects on labor demand and supply. Higher wages cause firms to demand fewer workers, but the higher wages also attract more people to work.

employment at U.S. parents of multinational service companies: a 1 percent increase in foreign employment or sales at affiliates of multinationals in a given service industry is associated with a 0.1 percent increase in employment at their U.S. parents.

How does one account for this positive association between increased affiliate activity and domestic employment in U.S. multinational service firms? Intrafirm exports appear to be a key part of the answer (box 1). Such exports are conduits for the transfer of intellectual property and business services that support day-to-day operations and production of the final services sold to affiliates' local consumers. U.S. parent firms' exports of services to foreign affiliates totaled \$109.1 billion in 2009, or 22.5 percent of total cross-border service exports (table 7).²⁰ The majority of these exports were in the form of intangible intellectual property (figure 1). Management and consulting services; research, development, and testing services; and financial services were other large sources of intrafirm export earnings.²¹

BOX 1 Relationship between cross-border services exports and affiliate sales

There is a growing body of literature that investigates the relationship between cross-border services exports and affiliate sales, with the latter sometimes proxied by foreign direct investment (FDI) stocks. There is, in general, a consensus for complementarity. Kox (2009) states that foreign affiliates require headquarters and other specialized services from MNC parents while unaffiliated firms abroad similarly require intermediary services from the home country.^a Buch and Lipponer (2007), studying German banks, observe that higher FDI in a foreign market is strongly associated with higher financial service exports to that market, though higher country risk and lax banking supervision may dissuade investment, but not necessarily trade.^b Fillat-Castejón, Francois, and Wörz (2009) observe aggregate services imports and inbound direct investment moving in tandem over the short term in response to trade and investment conditions. Over the long term, they see direct investment promoting trade, but not vice versa.^c Nordås and Kox (2009) find cross-border exports and affiliate sales to be complements, although they caution that regulatory heterogeneity, by raising the cost of establishment, may discourage investment and promote cross-border trade, resulting in a substitution effect.^d

^a Kox, "What is Special in Services Liberalization?" 2009, 4.

^b Buch and Lipponer, "Evidence from German Banks," 2006, 820-833.

^c Fillat-Castejón, Francois, and Wörz, "Cross-Border Trade and FDI in Services," 2009, 9-18.

^d Nordås and Kox, "Quantifying Regulatory Barriers to Services Trade," 2009, 20-26.

²⁰ USDOC, BEA, *Survey of Current Business*, October 2010, 36-55.

²¹ Management and consulting services are diverse, including human resources consulting, compensation and benefit consulting, biological and environmental consulting, administrative and general management consulting, marketing consulting, and process, distribution, and logistics consulting. R&D and testing services provide new knowledge, products, or processes by conducting original research on biology, environment, industrial processes, physical sciences, and social sciences. Financial services include banking, other credit intermediation services, securities and commodity intermediation and brokerage, and insurance underwriting and brokerage. USDOC, BEA, *Guide to Industry Classifications for International Surveys, 2007*, BE-799 (REV. 12/2007).

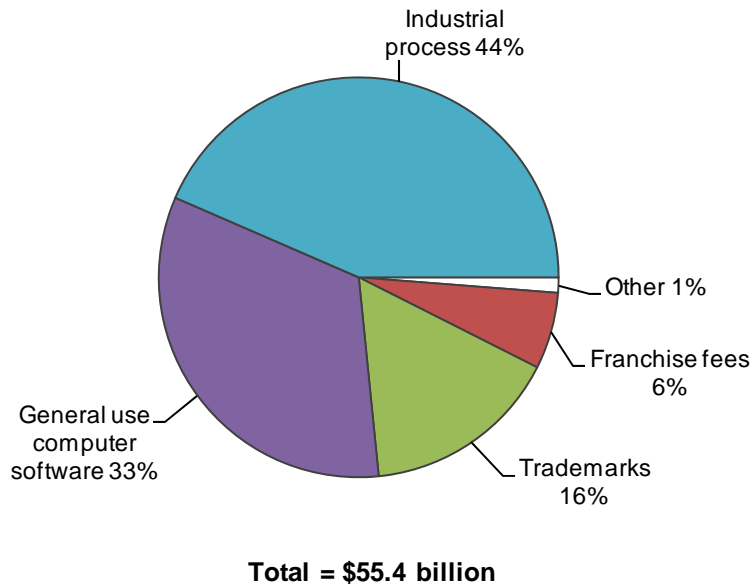
TABLE 7 Multinational parent firms' intrafirm exports of services (\$ millions)

Industry	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Business, professional, & technical	23,794	26,680	29,443	30,947	32,177	35,022	36,033	24,027	32,630	36,176	37,320
Computer and information services	(^a)	(^a)	1,424	1,686	1,960	1,993	2,115	1,968	2,786	3,247	3,758
Management & consulting services	(^a)	(^a)	10,845	12,800	12,883	14,133	16,710	11,299	15,168	16,467	15,672
R&D and testing services	(^a)	(^a)	6,564	7,536	8,297	8,275	9,135	4,848	7,630	8,014	9,257
Operational leasing	(^a)	(^a)	2,157	2,874	2,593	3,000	3,300	1,027	1,717	1,979	2,037
Construction, architecture & engineering	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	685	662	814	811
Industrial engineering	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	367	453	419	419
Installation, maintenance & repair of equipment	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	456	580	847	897
Legal services	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	41	56	63	86
Advertising	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	1,937	(^a)	(^a)	2,110
Financial services	6,023	6,091	6,401	6,750	8,141	8,623	8,874	8,756	12,449	8,376	7,054
Intangible intellectual property	27,575	28,255	27,180	29,656	32,324	39,399	44,408	46,938	54,410	59,792	55,430
Telecommunications	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	1,296	2,065	2,698	3,047
Audiovisual services	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	(^a)	4,826	5,632	5,309	6,215

Source: USDOC, BEA, *Survey of Current Business*, various issues.

^a Not available.

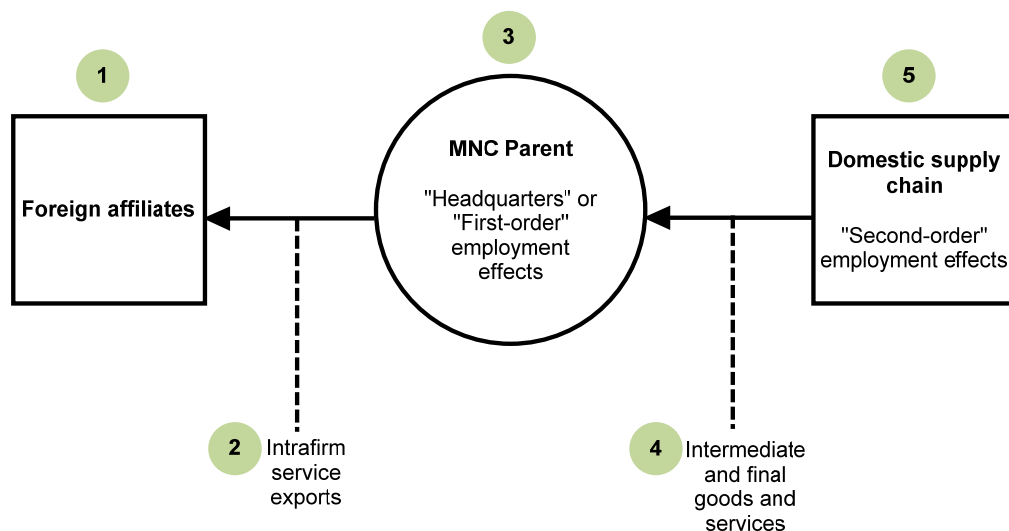
FIGURE 1 Intrafirm exports of intangible intellectual property, by type, 2009



Source: USDOC, BEA, *Survey of Current Business*, October 2010, 44.

Intrafirm exports support jobs at multinational parent firms' headquarters and throughout their U.S. supply chains. "Headquarters" or "first-order" job effects result from parents augmenting domestic staff to provide services demanded by foreign affiliates. "Second-order" effects occur throughout the domestic supply chain as parent firms increase production to meet affiliates' demand for services. The parent firms require greater amounts of goods and services to increase production, thus supporting jobs among their suppliers (figure 2).

FIGURE 2 An increase in intrafirm exports drives first- and second-order employment effects



- 1 Services multinationals establish foreign affiliates, sales through which are complementary to exports
- 2 and 3 MNC parents export final and intermediate services to foreign affiliates to support commercial operations, realizing "headquarters" or "first-order" employment effects
- 4 and 5 Increased production by MNC parents in response to foreign affiliates' demand requires more final and intermediate inputs, yielding "second-order" employment effects

We estimate the number of jobs supported by multinational service companies' intrafirm exports of services by consulting an employment requirements matrix²² developed by the BLS. This matrix identifies the U.S. employment effects of additional demand for an industry's products, both within that industry and throughout its U.S. supply chain (box 2). We present our estimates in table 8. To generate the estimates, we multiply the number of jobs supported by \$1 billion of additional demand for each service by the volume of U.S. multinationals' intrafirm exports of those services in 2008.²³ We find that almost 700,000 jobs are supported by intrafirm exports of services by U.S. multinational companies.²⁴ Appendix table A.1 presents our calculations in greater detail.

²² The employment requirements matrix can be found at USDOL, *Employment Projections*, "Nominal Dollar Based Domestic Employment Requirements" table for 2008 (http://www.bls.gov/emp/ep_data_emp_requirements.htm).

²³ It is likely that some of these intrafirm exports of services happened within multinationals specializing in the production of goods. However, a substantial share of such trade may happen between MNCs' subsidiaries in the U.S. specializing in services and the MNCs' foreign affiliates. For example, Ford Motor Company, a vehicle manufacturer, owns Ford Motor Credit Company, which specializes in automotive finance. BEA defines a "parent company" as all U.S. operations of a U.S. MNC, so any services exports of Ford Credit would be recorded by BEA as coming from Ford Motor Company's (goods-producing) corporate parent.

²⁴ These estimates do not account for intrafirm exports of goods by multinational companies, which are substantial even among service multinationals. For example, in 2006, U.S. multinationals in the professional, scientific, and technical services industries exported \$5.2 billion in goods to their foreign affiliates. USDOC, BEA, Operations of Multinational Companies database (accessed June 16, 2011).

BOX 2 Domestic Employment Requirements Matrix

The domestic employment requirements matrix used for the calculations in this paper was developed by the Bureau of Labor Statistics (BLS). The matrix is derived from input-output data, and shows the employment generated directly and indirectly across all industries by a billion dollar increase in final demand for each industry's products. The input-output matrix is developed in connection with the bureau's employment projections process. The productivity data is collected by BLS in its Current Employment Survey of enterprises and Current Employment Survey of households. Productivity data reflect technology and labor productivity figures collected in 2008, with sectors identified by 2007 North American Industrial Classification System (NAICS) codes.^a

Each column of the employment requirements matrix shows the U.S. employment supported in each industry by a billion dollars in increased final demand. We use a version of the matrix that is adjusted to remove imports. The matrix provides employment effects for each industry as well as employment effects for each industry's entire supply chain. The employment figures are developed through a count of jobs, including full-time and part-time waged and salaried workers, self-employed workers, and unpaid family workers. Persons who hold multiple jobs can show up multiple times in the employment data.^b

BLS is careful to note additional limitations of the matrix. To develop the matrix, BLS assumes that input-output relationships are stable over time. Over long periods of time, changes to product mix and technology could alter these relationships, introducing error to employment effects. The relationships used in the matrix are average relationships; they may not hold on the margins, meaning the first or last unit of output may differ from the average. In addition, employment effects may be understated because investment purchases needed to increase output are excluded.^c

For more information on the Domestic Employment Requirements matrix, see U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), *Employment Outlook: 2008-2018, Layout and Description for 202-Order Employment Requirements Tables: Historical 1993 through 2008*, December 2009, or visit http://www.bls.gov/emp/ep_data_emp_requirements.htm.

^a USDOL, BLS, *Employment Outlook: 2008-2018* (December 2009), 3-4.

^b USDOL, BLS, *Employment Outlook: 2008-2018* (December 2009), 4.

^c USDOL, BLS, *Employment Outlook: 2008-2018* (December 2009), 5-6.

TABLE 8 Estimated number of jobs supported by intrafirm exports of services by multinational companies, 2008

Services exported by parent firms of U.S. multinational companies	Intrafirm exports of services by U.S. multinational companies (\$ billions)	Jobs supported by intrafirm exports of services by U.S. multinational companies ^a
Computer and information services	3.247	23,395
Management and consulting services	16.467	153,342
R&D and testing services	8.014	58,024
Operational leasing	1.979	18,856
Construction, architectural, and engineering, services	0.814	7,280
Installation, maintenance and repair	0.847	8,371
Legal services	0.063	439
Financial services	8.376	45,799
Royalties and license fees ^b	60	367,739
Telecommunications	<u>2.698</u>	13,794
Totals	102.297	697,038

Sources: USDOC, BEA, Survey of Current Business, October 2010, 36-55; USDOC, BEA, Operations of Multinational Companies database (accessed June 16, 2011); USDOL, BLS, Employment Projections (accessed May 3, 2011).

^aCalculated by multiplying the number of jobs supported by \$1 billion of additional demand for each industry's products, as reported by BLS, by the value of intrafirm exports, as reported by BEA. Does not include jobs supported by intrafirm exports of advertising services; BEA did not disclose the value of these exports for 2008. See table A.1 for calculations.

^bAlso included in this category are newspaper, periodical, book, and directory publishing; software publishing; motion picture and video industries; sound recording industries; and radio and television broadcasts.

2: Banking Services

Summary

The recent global financial crisis had a substantial impact on the world's banking sector, with firms in developed countries generally experiencing the greatest losses. As large multinational banks seek new growth opportunities, they are increasingly looking to developing markets such as those in Asia and Latin America, where economic growth is relatively strong, emerging middle class populations have growing disposable incomes, and increasingly sophisticated banking services are in demand. The establishment of affiliate operations in such markets has the potential to create jobs in the U.S. banking industry and other industries that directly and indirectly support it. The headquarters employment effect is likely marginally positive, while job creation in a variety of services sectors in support of intrafirm trade between parent firms and their affiliates could be substantial. Our estimates indicate that intrafirm exports of financial services could result in over 45,000 new U.S. jobs across all sectors of the economy.

Industry Overview

In the context of this discussion, banking services comprise deposit taking and lending as well as fee-based commercial services to include financial management and transaction services, advisory services, custody services, credit card services, and other credit related services. While large multinational banks have increasingly expanded their service offerings to include securities, investment banking, and occasionally insurance services, this discussion focuses on the more traditional commercial banking activities that those companies provide.

The global banking industry has experienced a tumultuous period during the last few years directly resulting from the worldwide financial crisis. Many of the world's largest banks took unprecedented losses, while others increased their fortunes as new opportunities emerged and some of the traditionally dominant banks were preoccupied with their balance sheets. In 2010, the industry saw its first year of revenue growth since 2007, registering a 1.5 percent increase over the previous year to \$4.6 trillion.²⁵ This compares favorably to an 8.3 percent overall decline during the 2006-2010 period. U.S. banking revenues fell more sharply during the same period, 18.2 percent, but also rebounded in 2010 with a 6.6 percent increase over the previous year to register \$523.9 billion in revenues (figure 3).²⁶ The European region was responsible for generating the majority of global revenues at 47.4 percent, with North America and Asia following behind (22.6 and 12.1 percent, respectively) (figure 4). Interestingly, however, 40 percent of global banking enterprises are in the Asian region, while 29.1 percent are located in North America, and just 14.8 percent in Europe.²⁷ This likely reflects the comparatively concentrated and saturated nature of the U.S. and European markets, as well as the more fragmented, emerging nature of the largely developing Asian financial systems.

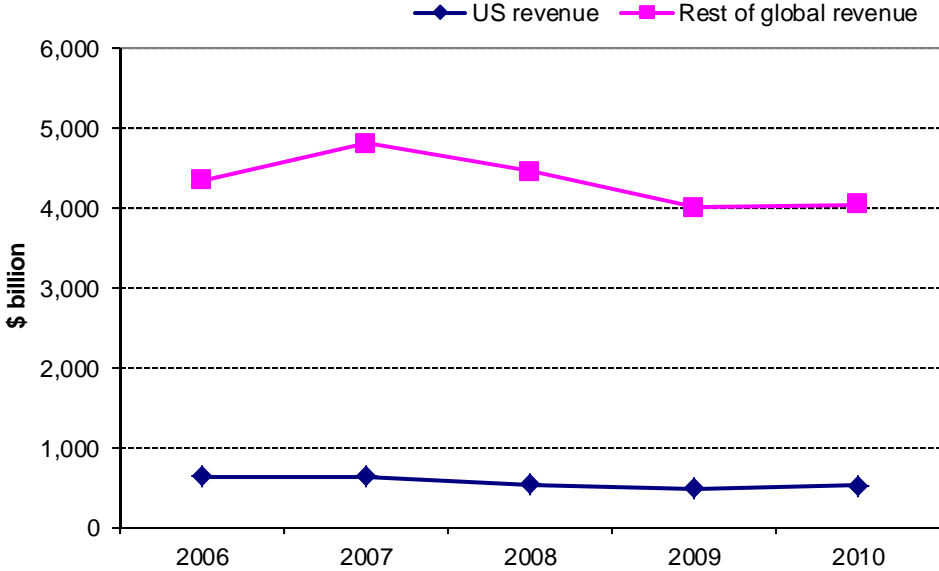
²⁵ IBISWorld, *Global Commercial Banks*, January 6, 2011, 4.

²⁶ IBISWorld, *Global Commercial Banks*, January 6, 2011, 4, and IBISWorld, *Commercial Banking in the U.S.*, January 2011,

34.

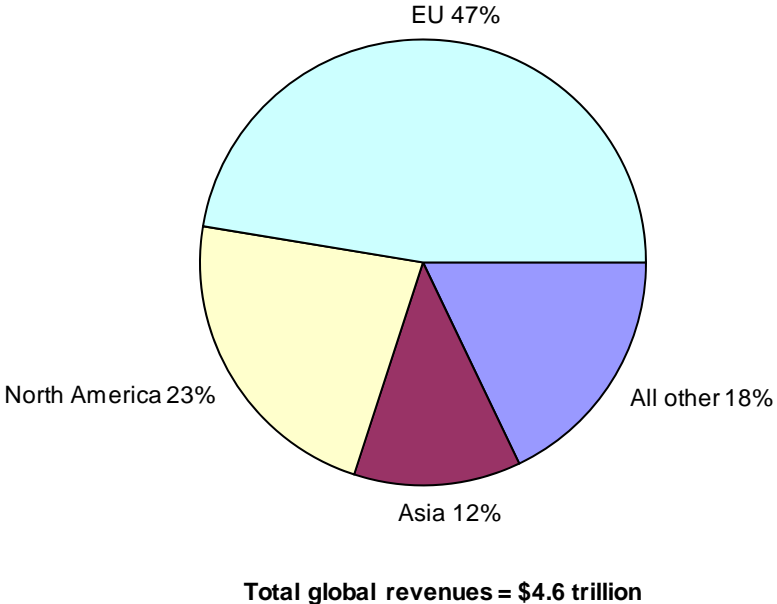
²⁷ IBISWorld, *Commercial Banking in the U.S.*, January 2011, 11-12.

FIGURE 3 US and global banking revenues, 2006–10



Sources: IBISWorld, *Global Commercial Banks*, January 6, 2011, 4, and IBISWorld, *Commercial Banking in the U.S.*, January 2011, 34.

FIGURE 4 Regional share of global banking revenues, 2010



Source: IBISWorld, *Global Commercial Banks*, January 6, 2011, 4.

Six of the top ten global banks in 2010 were European firms, though three U.S. banks—Bank of America, JPMorgan Chase, and Citigroup—held spots among the top ten due in large part to sheer size and reach, but perhaps also signaling their recovery from the financial crisis (table 9). Citigroup, in particular, suffered significant losses, but has managed to maintain a top spot among its peers, owing in large part to the relative stability of its vast international operations. All of the top global banks operate in countries outside their own, as is almost always necessary for banks in developed countries that want to escalate growth, as competition tends to be high and margins small in their home markets.

TABLE 9 Top ten global banks by assets, 2009

Bank	Country of parent	Assets (\$ billion)
BNP Paribas	France	2,965
Royal Bank of Scotland	United Kingdom	2,750
Credit Agricole Group	France	2,441
HSBC Holdings	United Kingdom	2,364
Barclays	United Kingdom	2,235
Bank of America	United States	2,223
Deutsche Bank	Germany	2,162
JPMorgan Chase & Co.	United States	2,032
Mitsubishi UFJ Financial Group	Japan	2,026
Citigroup	United States	1,857

Source: The Banker, Top 1000 World Banks 2010, www.thebanker.com, July 6, 2010.

Large U.S. banks tend to have affiliates outside the United States (table 10), though for some, foreign expansion has slowed in the wake of the financial crisis in order to focus on strengthening domestic operations. In 2009, for example, Bank of America elected to sell 68 percent of its overall 19 percent stake in China Construction Bank in its efforts to raise cash to cover its domestic losses.²⁸ However, this has been a balancing act for U.S. firms because foreign operations have also proven to be a more consistent source of revenue than domestic operations during the downturn. Despite Bank of America's pullback from the Chinese market, its international operations accounted for 20 percent of its total revenues in 2009, compared with an average of 9 percent prior to the financial crisis.²⁹ This increase was largely due to strong revenue growth in operations outside North America, and particularly in Asia, though U.S. revenues also grew albeit more slowly.³⁰ As domestic banks grow healthier they will likely seek more opportunities to establish affiliates in foreign markets, particularly developing countries, where growth opportunities may be greater.

TABLE 10 Assets and foreign operations of U.S. banks among the top 25 global banks, 2009

Bank	Assets (\$ billion)	Number of countries
Bank of America	2,223	44
JPMorgan Chase Bank	2,032	40
Citigroup	1,857	100
Wells Fargo Bank	1,244	^(a)

Sources: The Banker, Top 1000 World Banks 2010, www.thebanker.com, July 6, 2010; and individual company websites.

^a Not available.

²⁸ Bloomberg, David Milken, "Bank of America, Li Ka-Shing Reduce China Bank Stakes," January 7, 2009.

²⁹ Average taken from international revenues during 2004-08, Bloomberg database.

³⁰ Revenue growth for Bank of America's operations outside North America registered 568 percent from 2004-08, with Asian revenues growing 1358 percent, Latin American revenues growing 50 percent, and European, Middle Eastern, and African revenues rising 540 percent during that period. By comparison, U.S. revenues increased by 110 percent. These figures include revenue from all of Bank of America's business lines, and it is likely that some portion of that growth resulted from Bank of America's acquisitions of Merrill Lynch and Countrywide. Revenue figures from Bloomberg database.

The global banking industry, which is generally quite fragmented, has been consolidating for many years. Prior to the global financial crisis, merger and acquisition (M&A) activity was high, with larger banks in developed markets merging with smaller banks to gain market share in saturated environments, or acquiring firms in foreign countries as a method of entry into developing-country markets where economic growth is strong, disposable incomes are rising, and populations are underbanked. There were 55,279 commercial banks worldwide in 2010, of which 6,410 were U.S. banks, representing declines of 12 and 7 percent, respectively, from 2006 levels.³¹

Expansion into developing-country markets is increasing, but emerging market banks themselves are vying for market share and may have less fallout from the financial crisis to contend with. Some of the most successful Western banks have a limited, strategic presence in a large number of countries and have been entrenched for a long time (e.g., Citigroup, Standard Chartered (UK), and HSBC (UK)) and enjoy certain advantages such as brand awareness that new Western entrants lack. Additionally, many emerging market banks themselves are becoming stronger competitors, further limiting the opportunities for foreign banks to gain market share.³² Emerging market banks are growing much more rapidly than Western banks, reaching 53 percent of global market capitalization in 2009.³³ However, profits earned by large developed-country banks in emerging markets were equivalent to roughly one-quarter that of the local banks,³⁴ demonstrating the success that global banks have had in developing markets and the allure of those markets for such banks seeking new growth opportunities.

Operations of Multinational Banks and Links to Employment

Banking services can be traded cross-border or through establishment of an affiliate in a foreign market, with the latter comprising a much larger share of sales. In 2008, cross-border exports of financial services³⁵ totaled \$60.8 billion, while foreign affiliate sales registered \$175.9 billion. In commercial banking, this discrepancy is due in part to the fact that the industry relies heavily on deposit taking and lending, which require strong local branch networks.

There were 14.9 million people employed in the global banking industry in 2010, with 1.5 million of those, or nearly 10 percent of the workforce, in the United States.³⁶ These figures represent an overall increase in global employment of 7 percent over 2006 levels, but a 6 percent decrease in U.S. banking employment during the same period. This is consistent with the growth of banking in many developing markets, where much of that job creation likely took place, while banks in the United States and Europe contracted. However, wage growth in the sector during that same period demonstrated the opposite effect: global wages declined 6 percent while commercial banking wages in the United States grew by a modest 1 percent.³⁷ The decline in jobs in the United States banking industry appears to be a direct result of the financial crisis, as employment was on the rise prior to 2008. Typically, however, banks need to maintain strong workforces in order to be competitive. Even though many commercial and

³¹ IBISWorld, *Global Commercial Banks*, January 6, 2011, 4, and IBISWorld, *Commercial Banking in the U.S.*, January 2011, 34.

³² Economist, "World Banks: We Lucky Few," May 14, 2010.

³³ China accounted for roughly half of this share. Economist, "World Banks: The Bigger and Bigger Picture," May 14, 2010.

³⁴ Economist, "World Banks: The Bigger and Bigger Picture," May 14, 2010.

³⁵ Financial services trade data include a wider range of activities such as securities services that are not the focus of this chapter. BEA, *Survey of Current Business*, October 2010.

³⁶ IBISWorld, *Global Commercial Banks*, January 6, 2011, 4, and IBISWorld, *Commercial Banking in the U.S.*, January 2011, 34.

³⁷ This wage shift is likely a reflection of an increase in banking employment in developing countries, where wages are lower, driving down average global wages. IBISWorld, *Global Commercial Banks*, January 6, 2011, 4, and IBISWorld, *Commercial Banking in the U.S.*, January 2011, 34.

retail banking services have become automated, branch expansion has increased in the United States and customer service is of paramount importance for banks to retain customers and attract new ones.³⁸

When multinational banks establish affiliates abroad, it is usually to develop new revenue streams and serve local clients, not to reduce the number of more costly domestic jobs.³⁹ In fact, significant job losses are more likely due to fluctuations in overall financial conditions, such as those seen in recent years, rather than to establishment of affiliates. Employment at affiliates tends to be complementary to U.S. employment, mirroring the types of jobs found in the headquarters and domestic branches. The “first order” or headquarters employment effects resulting from establishment of an affiliate are likely marginally positive, i.e., there would likely be a small number of jobs created at the home office to directly support the operations of the new affiliate (such as a country manager or international accounting specialist). However, a more significant employment effect results from the volume of intrafirm trade—principally U.S. bank parent firms’ exports of financial services to their foreign affiliates following the establishment of such affiliates. To illustrate, if a U.S. bank were to establish an affiliate in India, the parent firm would likely export some services, such as credit intermediation, to the affiliate in support of its local operations. Those “intermediate services,” along with other non-financial services such as accounting, advertising, and administrative services, bolster employment at the U.S. parent firm as well as at the firms that supply them to the parent. The BLS data suggest that a \$1 billion increase in final demand for financial services (banking and securities) supported over 5,000 U.S. jobs in 2008, the majority of which were financial services jobs. When applied to the value of intrafirm exports of financial services in 2008, \$8.4 billion,⁴⁰ the result is more than 45,000 U.S. jobs supported across multiple industries (see chapter 1 and Appendix table A.1 for further explanation of the BLS data and our calculations).

The BLS data enable us to examine the jobs supported per \$1 billion of demand for certain banking services.⁴¹ As expected, the majority of jobs are in the monetary authorities, credit intermediation, and related activities category. The “second-order” job effects, that is, jobs that are supported in sectors that directly or indirectly support the banking sector, also see some notable growth. The securities and investment and insurance sectors, both of which tend to have close ties to the banking sector and in many cases are also provided by large multinational banks, are both among the sectors with the greatest job effects, as are building, employment, management and business support services. Table 11 shows the number of jobs supported in various industries by additional demand for banking services. However, it should not be assumed that additional supply of services to foreign affiliates always has employment effects identical to those detailed below.

³⁸ IBISWorld, *Commercial Banking in the U.S.*, January 2011.

³⁹ This is not to say that certain functions such as those performed in customer services centers are not subject to outsourcing, but such decisions are not likely linked to establishment of an affiliate.

⁴⁰ This figure includes exports of banking as well as securities and other financial services, but excludes insurance. USDOC, BEA, *Survey of Current Business*, October 2010, 36-55; and USDOL, BLS, *Employment Projections*, http://www.bls.gov/emp/ep_data_emp_requirements.htm, accessed May 3, 2011.

⁴¹ The banking services included in the BLS data are services performed by monetary authorities, credit intermediation services, and related activities. US Department of Labor, Bureau of Labor Statistics, *Domestic Employment Requirements Table*, December 10, 2009.

TABLE 11 U.S. jobs supported by additional \$1 billion of banking services^a output, top 10 industries, 2008

Industry	Job increases
Monetary authorities, credit intermediation, and related activities	3,286
Securities, commodity contracts, and other financial investments and related activities	239
Food services and drinking places	232
Services to buildings and dwellings	150
Agencies, brokerages, and other insurance related activities	138
Retail trade	124
Employment services	120
Management of companies and enterprises	77
Investigation and security services	66
Business support services	61
All other	1,086
Total	5,579

Source: U.S. Department of Labor, Bureau of Labor Statistics, Domestic Employment Requirements Table, December 10, 2009.

^a Services of monetary authorities, credit intermediation services, and related activities.

The types of jobs created within the U.S. banking sector when demand increases represent the full spectrum of responsibilities, from managers and financial analysts, to loan officers and tellers (table 12), though the scope of new jobs resulting from increased exports to affiliates may be more narrow, as location specific positions, such as loan officers, new account clerks, and tellers, would not likely be in higher demand. Growth in the number of employees in the U.S. banking industry during 2002-09 was mixed, as jobs in certain occupations such as securities, commodities, and financial service agents, loan officers, and business and financial operations increased, while the number of managers, new account clerks, financial managers and customer service representatives decreased.⁴² It is unclear why employment in some occupations declined while in others it rose, but it may be that cuts to higher salaried workers, bank managers and financial managers, for example, presented a means by which to reduce costs while minimizing layoffs during the financial downturn. Further, the numbers of customer

TABLE 12 Employment and wages for certain occupations within the U.S. banking sector, 2002-09

Occupation	Employment, 2009	CAGR 2002-09 (%)	Annual mean wages, 2009 (\$)	CAGR 2002-09 (%)
Business and financial operations	671,940	3.7	73,682	3.4
Customer service representatives	216,330	-0.4	33,714	2.5
Financial managers	108,650	-1.5	120,676	4.0
First-line supervisors/managers of office and administrative support workers	167,650	1.6	54,076	3.0
Loan interviewers and clerks	160,390	2.3	35,576	2.6
Loan officers	264,170	4.5	63,532	2.5
Management occupations	250,780	-4.0	125,532	3.5
New accounts clerks	76,150	-2.5	31,110	2.4
Office and administrative support occupations	1,666,980	-0.6	35,062	2.4
Sales and related occupations	215,960	0.8	61,822	2.1
Securities, commodities, and financial services sales agents	113,390	15.7	59,716	2.7
Tellers	555,060	1.4	24,784	1.8

Source: USDOL, BLS, Occupational Statistics database, accessed May 2, 2011.

⁴² USDOL, BLS, Occupational Statistics database, accessed May 2, 2011.

service representatives and managers may have declined as bank mergers forced closure of redundant storefronts, and more banking functions are conducted online. It should be noted, however, that wages across all the occupations in the banking sector grew consistently throughout the period.

Some domestic job losses may occur as U.S. banks expand their global footprints and increase foreign revenues. Areas where jobs might be moved to lower-cost countries for the primary purpose of reducing costs could include data processing and customer service centers, though it is likely that those shifts would occur independent of affiliate growth. Further, certain trade restrictions in foreign markets may have an impact on domestic employment. For example, some countries require that foreign banks maintain all back office data operations in-country. This is typically viewed as a costly burden for foreign banks as they would typically run those operations out of consolidated, often domestic or regional data centers. By requiring those firms to establish data operations in-country, such regulations not only add considerable costs to establishment of the affiliate, but also nullify any job creation that would have occurred at the consolidated data center.

Citigroup is potentially facing the aforementioned problem in Turkey, as pending regulation would require all data functions to be done in-country. According to a Citigroup representative, not only would such regulation cost it hundreds of millions of dollars, but would actually have a negative employment effect on the datacenters where such functions for its Turkish operations are currently housed, in Warsaw and London.⁴³ And while this example does not affect U.S. domestic employment per se, a similar job loss could certainly occur in U.S. data centers.

Finally, there is a probable third-party employment effect that results when large multinational banks expand their affiliate networks. If these banks can more easily finance U.S. services and manufacturing firms' growth in foreign markets where they have affiliates, the resulting expansion to those companies' revenues could result in some positive first- and second-order employment effects in the United States. Further research would be required to more fully examine this issue.

⁴³ Industry representative, meeting with Commission staff, Washington, DC, April 2, 2010.

3: Computer Services

Summary

This chapter's primary focus is the foreign activities of multinational corporations that specialize in the delivery of computer services. The rapid adoption and integration of computers into business operations have driven demand for computer services, both in the United States and abroad, leading large computer service firms to establish foreign affiliates around the globe to supply these markets. The effects on U.S. employment of international expansion by these firms are ambiguous. Employment at U.S. parent firms of computer services multinationals fell slightly in recent years, while employment grew at their majority-owned foreign affiliates. The reasons for the declines in the former are unclear. Furthermore, employment in the broader U.S. computer services industry maintained steady growth—and analysts project that this growth will continue in the next decade.

This chapter also examines intrafirm exports of computer services by the wider universe of U.S. multinational corporations. The data that we examine suggests that the foreign affiliate activities of U.S. multinational corporations, insofar as they generate intrafirm trade in computer services, likely support a moderate number of domestic jobs among computer services providers and other high-skilled, high wage occupations.

Overview

Professional computer service firms provide the expertise and technical support necessary to help businesses and consumers use technology more efficiently, offering assistance in designing, implementing, and managing information technology (IT) systems.⁴⁴ Such services include computer systems design, custom computer programming, computer facilities management services, and other computer related services.⁴⁵ Computer service providers are employed by a wide range of industries, from dedicated computer service firms to consulting firms or hardware manufacturers that offer a few or many computer services in addition to their core business activities.⁴⁶

The economic downturn reversed a trend of steady growth in the global computer services market, weakening demand for such services in 2009 as spending contracted across many major markets.⁴⁷ From 2004 through 2008, global spending on computer services grew at an average annual rate of 6.1 percent to reach \$745 billion. This growth was driven by a growing preference for end-to-end computer systems over discrete hardware and software components, for business operations in developed countries.⁴⁸ In 2009, however, spending fell 4 percent to \$715 billion.⁴⁹ The decline in overall spending in 2009 was largely driven by contractions in the world's largest computer services markets—the United States and

⁴⁴ Cathers, "Industry Surveys," May 6, 2010.

⁴⁵ For the purposes of this analysis, the scope is limited to professional computer services, which roughly correspond to NAICS code 5415: Computer Systems Design and Related Services. U.S. Census Bureau, "2007 NAICS Definition: Sector 54," 2007.

⁴⁶ Bureau van Dijk, Orbis Companies Database, n.d. (accessed January 26, 2011).

⁴⁷ World Information Technology and Services Alliance (WITSA), *Digital Planet 2010*, October 2010, 26.

⁴⁸ United Nations Conference on Trade and Development, *Information Economy Report 2007–08*, xxvi; IBM, "Computer Services and Management Consulting," 1, June 2006.

⁴⁹ Figures for computer services expenditure include outsourced services, both offshore and domestic, including IT consulting, systems integration, custom software development, web page design, network systems and systems integration, office automation, facilities management, equipment maintenance, web hosting, computer disaster recovery, and data processing services. WITSA, *Digital Planet 2010*, October 2010, 20.

the EU. U.S. spending on computer services fell 5.4 percent to \$311 billion while spending in Europe contracted 7 percent to \$219 billion.⁵⁰

The United States hosts the world's largest computer services market, so it follows that it is also home to many of the world's leading computer services firms (table 13). International Business Machines, Inc. (IBM) and Hewlett-Packard (HP), both of which initially focused solely on manufacturing, are now the largest computer service firms in the world. In 2009, IBM derived the majority of its revenues (58 percent) from service activities; HP's services segment generated 30 percent of total revenue, or approximately \$34.7 billion.⁵¹ U.S.-based Computer Sciences Corporation (CSC) is the world's largest independent computer service provider, and the third largest computer services firm in the world.⁵² However, U.S. MNCs face increasing competition from providers based in developing economies, particularly India, as evidenced by Tata Consultancy Services Limited's (TCS) position among the top 10 global firms. The spread of telecommunication networks and the lower cost of computing have facilitated service provision from developing countries, allowing providers such as TCS to offer cost competitive services in the global market.

Although the U.S. market remains integral to many of these firms,⁵³ faced with an increasingly globalized market, the leading U.S. computer service firms all have global operations. As of 2009, IBM had subsidiaries in 62 countries, HP's subsidiaries were located in 70 countries, and CSC operated in at least 30 countries.⁵⁴ The growing importance of foreign markets for U.S. MNCs over the past ten years is illustrated by comparing U.S. parent companies to their foreign affiliates. From 1999 through 2008, assets held by affiliates of U.S. computer service firms more than tripled, growing from \$82.7 billion in 1999 to \$269.6 billion in 2008, or an average annual rate of 14 percent, surpassing those held by the U.S. parents (figure 5).⁵⁵ By comparison, assets held by U.S. parent companies increased from \$122.4 billion to \$180 billion over the same period.⁵⁶ Based on the distribution of assets, it is unsurprising that these international operations frequently account for a substantial share of company revenue. In 2009, almost two thirds of IBM's revenue and over a third of CSC's revenues were generated outside the United States.⁵⁷

Over the past decade, many U.S. MNCs have focused their expansion towards opportunities presented by rapid economic growth in emerging markets. Demand for computer services in the Asia-Pacific region has grown rapidly over the past five years, rising at an average rate of 8.5 percent annually from 2004 through 2008.⁵⁸ In particular, India and China are now among the largest consumers of computer

⁵⁰ WITSA, *Digital Planet 2010*, October 2010, 26.

⁵¹ IBM, *Annual Report 2009*, 2010, 26; HP, *2009 Annual Report*, 2010, 158.

⁵² CSC derives 100 percent of its revenues from computer services, unlike firms such as IBM and HP, which both operate in other industries.

⁵³ The United States was the only country to account for more than 10 percent of HP's net revenue in 2009, representing 36 percent of HP's total consolidated net revenue. HP, *2009 Annual Report*, 2010, 158.

⁵⁴ IBM, *Annual Report 2009*, 2010, 6; HP Company Web site, "HP Global Citizenship" (accessed October 27, 2010).

⁵⁵ Data on assets held by U.S. parents and their foreign affiliates are presented in lieu of sales figures due to data limitations. Data on sales by U.S. computer services parents and their foreign affiliates are suppressed by the BEA for much of the past decade to avoid disclosure of data from individual firms. USDOC, BEA, "Selected Data for Majority-Owned Nonbank Foreign Affiliates and Nonbank U.S. Parents in All Industries," 1999–2008 (accessed April 26, 2011).

⁵⁶ USDOC, BEA, "Selected Data for Majority-Owned Nonbank Foreign Affiliates and Nonbank U.S. Parents in All Industries," 1999–2008 (accessed April 26, 2011). These data are classified based on NAICS industry of the U.S. parent. As a result, they do not capture firms that provide computer services but are classified under a NAICS code other than 5415, such as HP.

⁵⁷ In 2009, foreign markets accounted for 64.3 percent of IBM's and 38.3 percent of CSC's. IBM, *Annual Report 2009*, 2010, 125; CSC, *Annual Report 2009*, 2010, 108.

⁵⁸ Author calculations based on data from WITSA, *Digital Planet 2010*, October 2010, 26.

TABLE 13 Top ten computer systems design and related services companies, 2009^a

Rank	Company name	Country of headquarters	Revenue from services	Services' share of total revenue
			Billions of \$	%
1	International Business Machines Corporation (IBM)	U.S.	55.0	58
2	Hewlett-Packard Company (HP) ^b	U.S.	34.7	30
3	Computer Sciences Corporation (CSC) ^c	U.S.	16.1	100
4	NTT Data Corporation ^d	Japan	12.3	100
5	Capgemini	France	11.7	100
6	Science Applications International Corporation (SAIC) ^e	U.S.	10.8	100
7	Cisco Systems Inc. ^f	U.S.	7.6	19
8	Atos Origin	France	7.2	100
9	Tata Consultancy Services Limited (TCS) ^d	India	6.4	75
10	Logica PLC	UK	5.8	100

Sources: Bureau van Dijk, Orbis database (accessed December 27, 2010); company Web sites, annual reports, and SEC filings.

^a Includes only those firms for which Orbis reported computer systems design and related services as a primary industry. Ranking based on revenues from services.

^b Revenues for the 12 months ending on October 31, 2009.

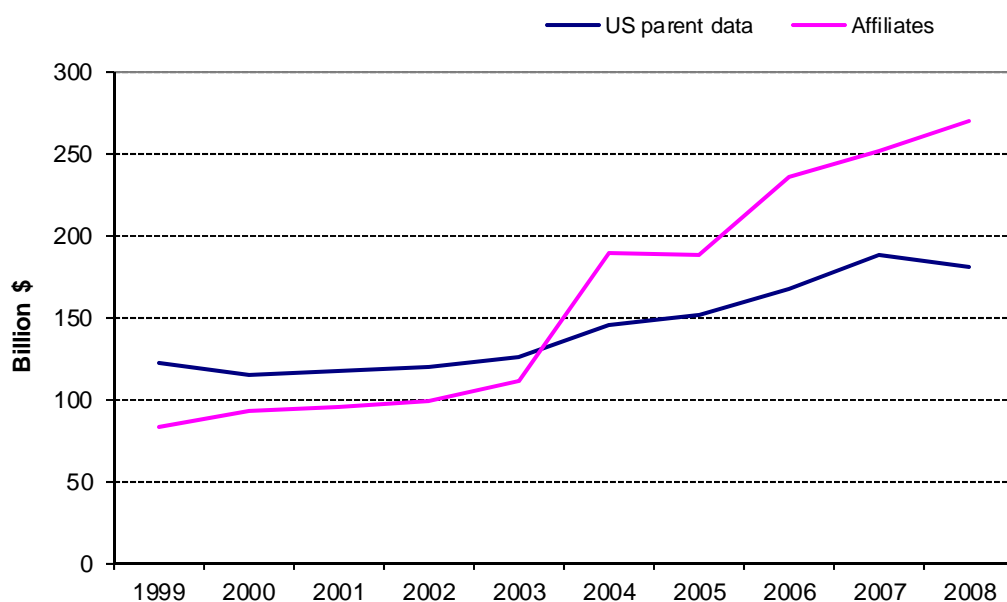
^c Revenues for the twelve months ending April 2, 2010. May include some revenues from software licensing fees.

^d Revenues for the twelve months ending March 31, 2010.

^e Revenues for the twelve months ending January 31, 2010.

^f Revenues for the twelve months ending July 31, 2010.

FIGURE 5 Total assets of computer systems design firms, by industry of parent, 1999–2008



Source: USDOC, BEA, "Selected Data for Majority-Owned Foreign Affiliates," 1999–2008.

services in the region, behind only Japan and Australia. From 2004 to 2009, spending in India rapidly grew from \$3.2 billion to \$5.3 billion, and in China, spending on computer services more than doubled from \$10 billion to \$26.2 billion.⁵⁹ Recognizing new business opportunities, many U.S. MNCs have entered these markets. In 2008 alone, IBM's revenue from the BRIC markets (Brazil, Russia, India, and China) increased 18 percent.⁶⁰

The recent economic downturn further underscored the value of these international operations; in 2009, many emerging markets proved more resilient than those in Western economies, as demand for computer services remained steady. The Asia-Pacific region proved the most robust as computer spending increased by 4.2 percent in 2009.⁶¹ In Latin America and Africa, spending on computer services maintained positive, albeit slow, growth during 2009, increasing 0.3 percent and 1 percent, respectively.

Employment in Computer Services

Overall, employment in the U.S. computer services industry has maintained steady growth—a trajectory that is projected to continue, despite a slowdown in 2009. Employment increased at an average annual rate of 4.3 percent from 2002 through 2008. However, due to the weak economy in 2009, computer service firms faced lower demand from U.S. customers as IT budgets declined⁶² and clients became price sensitive, resulting in price negotiations and short-term contracts.⁶³ As a result, employment growth slowed to 0.5 percent, reaching 1.4 million.⁶⁴ Despite this slowdown, the U.S. computer services industry is projected to be among the fastest growing areas of employment over the next decade, and almost all computer service occupations are expected to exhibit rapid growth, as firms across all industries require increasingly sophisticated computer networks as well as new computer-related security services.⁶⁵

Among U.S. multinational computer service firms, employment by foreign affiliates has grown more rapidly than employment by U.S. parents. Employment at majority-owned foreign affiliates of U.S. firms rose at an average annual rate of 4.2 percent between 1999 and 2008.⁶⁶ In contrast, employment at U.S. parent firms fell slightly, from 394,000 in 1999, to 386,000 in 2008, representing a decline of 2 percent. As a result, from 1999 through 2008, employment at foreign affiliates of U.S. firms surpassed employment at U.S. parent firms (figure 6), demonstrating the rising importance of presence in foreign markets for U.S. computer service firms.

⁵⁹ WITSA, *Digital Planet 2010*, October 2010, 26.

⁶⁰ IBM, *Annual Report 2008*, 2009, 11.

⁶¹ WITSA, *Digital Planet 2010*, October 2010.

⁶² McDonald, Mark, "Innovation Marching On," September 8, 2009; The Federal Reserve Board, "Summary: April 15, 2009," April 15, 2009.

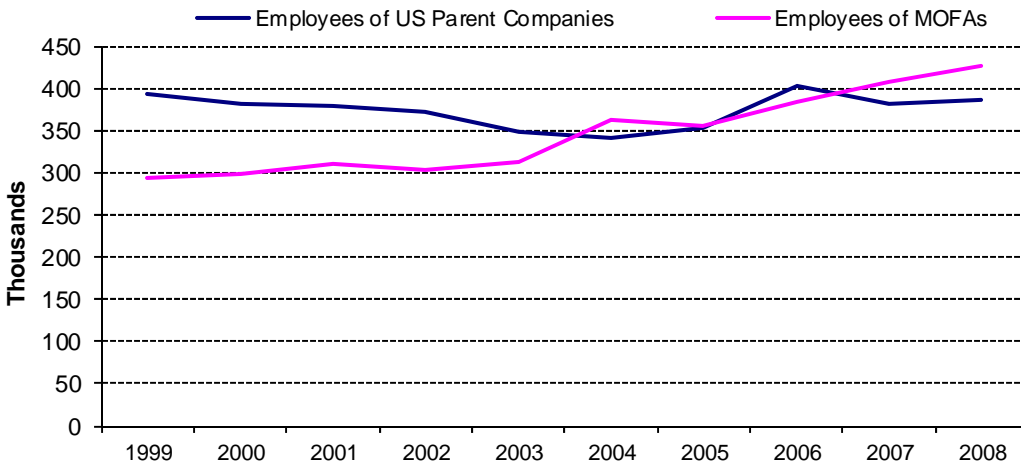
⁶³ The Federal Reserve Board, "Summary: April 15, 2009," April 15, 2009; OECD, "The Impact of the Crisis on ICT and ICT-Related Employment," October 2009, 15.

⁶⁴ Author calculations using data from USDOL, BLS, "Computer Systems Design and Related Services," May 2009.

⁶⁵ Woods, Rose A., "Employment Outlook: 2008–2018," *Monthly Labor Review*, November 2009, 56.

⁶⁶ Data for 2008 are the most recent available. Author calculations based on data from USDOC, BEA, "Majority-Owned Foreign Affiliates," and "U.S. Parent Companies," 1999–2008.

FIGURE 6 Employees of MOFAs of U.S. computer systems design firms exceeded employment at U.S. parent companies in 2008.



Source: USDOC, BEA, "Majority-owned Foreign Affiliates," and "U.S. Parent Companies," 1999-2008.

Regional trends in affiliate employment, which paralleled trends in computer services spending, further illustrate the importance of developing country markets for computer service providers. For example, although employment by U.S.-owned affiliates in Europe experienced very little growth between 1999 and 2008, employment by foreign affiliates in Latin America and Africa steadily increased.⁶⁷ However, the largest growth occurred in the Asia-Pacific region, where employment by U.S.-owned affiliates more than doubled, growing from 71,800 in 1999 to 185,000 in 2008.⁶⁸ As a result, during 1999 to 2008, the regional distribution of employment by U.S.-owned affiliates shifted (figure 7). The shares of employment by U.S.-owned affiliates in Europe and Canada fell from 58.7 percent and 8.5 percent, respectively, while employment by affiliates in the Asia-Pacific region grew, accounting for the largest regional share of employment in 2008 (43.5 percent).⁶⁹

Effects of Multinationals’ Foreign Activities on U.S. Employment

Although improvement in communication technologies enables remote provision of services, the bulk of trade in computer services occurs through foreign affiliates. In 2006, export revenue for U.S. computer service firms was estimated at \$7.1 billion; by comparison, in the same year U.S.-owned foreign affiliates supplied computer services worth \$52.5 billion.⁷⁰

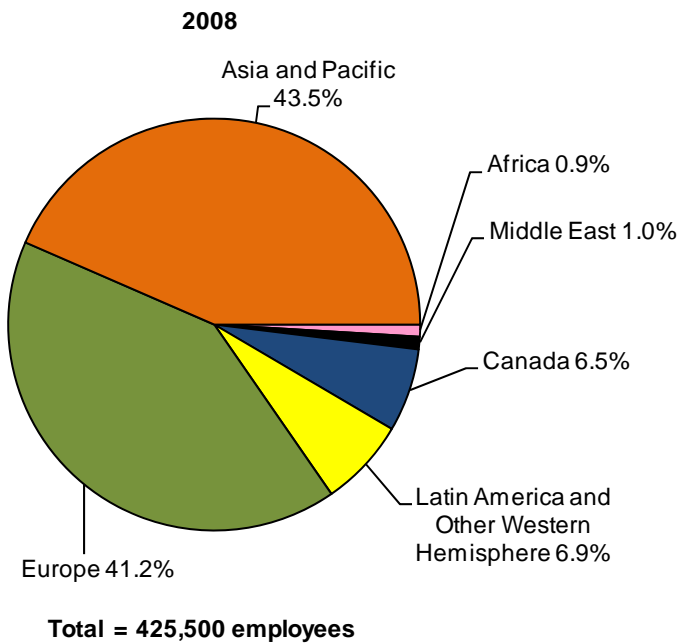
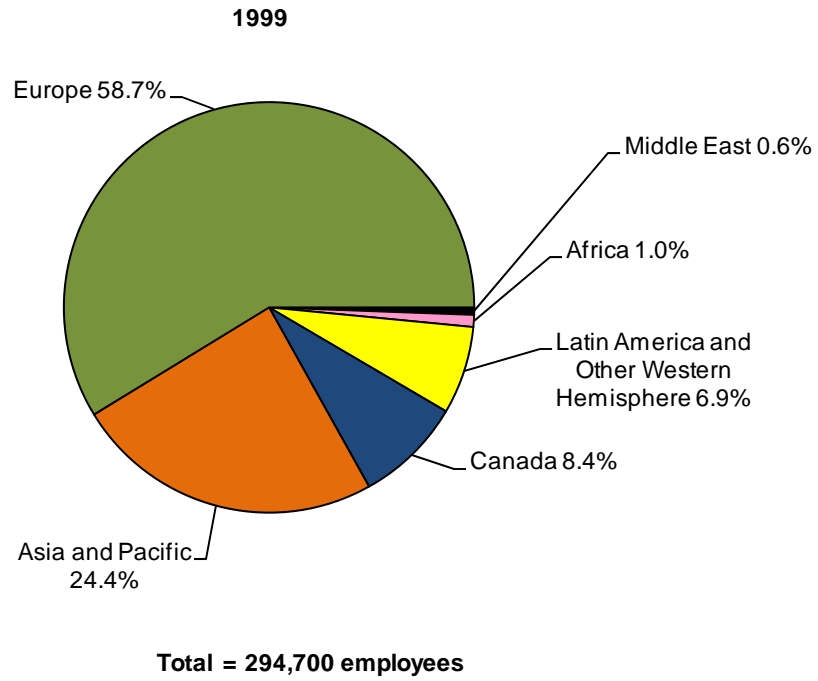
⁶⁷ In Latin America, foreign affiliate employment rose from 20,400 in 1999 to 29,400 in 2008. Over the same period, employment by foreign affiliates in Africa nearly doubled, albeit from a much smaller base, increasing from 2,800 to 4,000.

⁶⁸ Author calculations based on data from USDOC, BEA, "Majority-Owned Foreign Affiliates," and "U.S. Parent Companies," 1999–2008.

⁶⁹ Author calculations based on data from USDOC, BEA, "Majority-Owned Foreign Affiliates," 1999–2008.

⁷⁰ 2006 is the most recent year for which comparable data are available. Figures reporting services supplied by foreign affiliates of U.S. firms in 2007 and 2008 were suppressed by the BEA to avoid disclosure of data for individual firms. Export revenue figures are for computer systems design and related services (NAICS 5415) and are based on reporting by employer firms. U.S. Census Bureau, "Table 6.5.," 2005–09; USDOC, BEA, "Table 9.a," 2006–08.

FIGURE 7 Employment by majority-owned foreign affiliates of U.S. computer service firms in Asia and Pacific surpassed such employment in Europe in 2008



Source: USDOC, BEA, "Majority-Owned Foreign Affiliates," 1999-2008.

Leading computer service providers have developed extensive operations abroad, with those in India perhaps most impressive. IBM India, a subsidiary of IBM, is currently the company's largest operation outside the United States, employing 100,000 people, making it India's second largest private sector employer.⁷¹ In 1992, IBM entered the Indian market through a joint venture with the local firm, Tata, and five years later began operating an IBM Global Services segment there. In 1999, IBM bought out Tata's stake, and IBM India became a fully-owned subsidiary of U.S.-based IBM.

HP entered the services market through acquisition, rather than new ("greenfield") investment. In 2008, HP acquired Electronic Data Systems (EDS), which was the leading independent computer services firm at the time.⁷² This acquisition not only expanded HP's services offerings, making it one of the world's largest computer service firms, but also made HP the second largest IT multinational in India.⁷³ In 2007, over half of EDS' 41,000 foreign workers were located in India.⁷⁴

Available employment data for IBM and HP demonstrate that these firms' U.S. employment has declined over the past five to ten years. In 2002, IBM's 137,000 U.S. employees accounted for 43 percent of IBM's global workforce; by 2008, U.S. employment declined to 115,000, or 29 percent of the global workforce.⁷⁵ Similarly, available data for HP report that in 2002 (the earliest year available), U.S. employment totaled 67,352, or 48 percent of HP's total workforce. In 2007 (the most recent data available) U.S. employment had fallen to 53,519, or 31 percent of HP's total workforce.⁷⁶ However, although the numbers of U.S. workers have declined, in both cases, employment is relatively commensurate to regional revenue; for both IBM and HP, the United States accounted for roughly a third of global revenue in 2008 and 2007, respectively.⁷⁷

Even with these employment figures, it is not possible to isolate the effects on U.S. employment of computer services multinationals' foreign activities. For example, although IBM's U.S. employment reportedly declined to 105,000 in 2010,⁷⁸ these data may not capture the use of fixed-term contractors, a common practice among computer service firms, but one which is not captured in full time employment figures. Further, it is difficult to isolate the effects of international expansion from the effects of other factors affecting employment by U.S. MNCs, such as disruptive technology. For example, innovation has reportedly led to workforce reductions at HP's data centers, as much of the work can be automated through the use of software, and the number of data centers overall is falling as more powerful computer hardware, such as servers, have increased processing capacity, which allows fewer machines to handle more work.⁷⁹ Given the steady growth of total U.S. employment in the computer services industry, it is likely that international expansion by these firms supports at least a small number of jobs at the U.S. headquarters, but the specific employment effects of foreign investment by IBM, HP, and similar companies on the domestic workforce remain ambiguous.

Using data from the U.S. Department of Labor (USDOL), Bureau of Labor Statistics (BLS), we can examine a separate, but related question: the effects on U.S. employment of intrafirm exports of computer

⁷¹ Tejaswi and John, "IBM is India's Second Largest Pvt Sector Employer," August 18, 2010.

⁷² Cathers, "Industry Surveys," May 6, 2010, 3.

⁷³ Kulkarni, "EDS Buy gives HP Services, India Edge," May 14, 2008.

⁷⁴ Cathers, "Industry Surveys," May 6, 2010, 10.

⁷⁵ IBM, *Corporate Responsibility Report 2002, 2003*, 15; IBM, *Annual Report 2008, 2009*, 53.

⁷⁶ HP, *2003 HP Global Citizenship Report*, 2003, 23; HP, *HP FY07 Global Citizenship Report*, 2007, 134.

⁷⁷ IBM *Annual Report 2008, 2009*, 119; HP, *2007 Annual Report*, 2008.

⁷⁸ This figure is reported from congressional testimony; it was reported in 2010 that IBM would no longer report U.S. employment figures, instead providing global employment figures. IBM, *Annual Report 2008*, 11; IBM, *Understanding our Company*, March 2005, 29; Lounsbury, "IBM Stops Reporting U.S. Employment Numbers," March 19, 2010; Thibodeau, "IBM Stops Disclosing U.S. Headcount Data," March 12, 2010.

⁷⁹ Ortutay, "Hewlett-Packard to Cut 9K Jobs in Services Unit," June 1, 2010.

services by U.S. parent firms across all industries to their foreign affiliates. The BLS estimates employment effects, or jobs supported, based on an increase in final demand for a given service. These estimates provide information on the volume and types of U.S. jobs supported by a \$1 billion increase in final demand for computer services. Using the BLS estimates of employment effects in conjunction with data on the volume of intrafirm exports of computer and data processing services, we estimate the number of U.S. jobs supported by intrafirm exports of computer services by U.S. multinational companies.⁸⁰ However, it must be noted that it cannot be assumed that demand generated by foreign affiliates will result in effects corresponding exactly to those caused by domestic demand.

The BLS estimated that, in 2008, each additional \$1 billion of computer services output supported 8,387 U.S. jobs, of which roughly half were in industries related to computers. Of those, 3,831 were jobs in the computer systems design industry (table 14).⁸¹ When applied to the \$2.8 billion of computer and data processing services exported by U.S. parent firms to their foreign affiliates in 2008, these figures suggest that intrafirm exports of computer services supported 23,484 U.S. jobs, of which the largest share were in the computer systems design industry.⁸²

The large distribution of jobs supported in the computer systems design industry (hereafter computer services industry) is notable, because occupations within this industry tend to require highly educated and highly skilled workers.⁸³ In 2009, 55 percent of employment in the U.S. computer services industry was made up of professional computer service jobs, such as computer software engineering, computer programming, or computer systems analysis.⁸⁴ Due in part to the high percentage of professionals in the industry, on average, U.S. computer service workers earn higher annual wages than the average U.S. worker—\$80,050 in 2009, compared to the economy-wide average of \$43,460.⁸⁵ Within the industry, mean annual wages ranged from \$47,850 for computer support specialists to \$106,230 for computer and information research scientists.

Beyond the direct effects of jobs in the computer services industry, jobs are supported in a wide variety of industries. The second largest employment effect, following computer services, was among jobs in the employment services industry. Employment service firms include employment placement agencies, professional employer organizations, and temporary help services.⁸⁶ Employment services allow firms, such as computer service providers, to meet temporary or fixed-period employment needs without incurring adjustment costs, such as those associated with hiring or firing workers.⁸⁷ High-skilled workers, such as computer service employees, are accounting for a growing share of temporary workers; computer and mathematical occupations are among the fastest growing in employment services, rising

⁸⁰ For a more detailed discussion of the method used, see chapter 1.

⁸¹ Computer services output is defined using NAICS code 5415 Computer Systems Design and Related Services. USDOL, BLS, Domestic Employment Requirements table, December 10, 2009.

⁸² The USDOC, BEA reported that in 2008, U.S. parent firms provided \$2.8 billion of computer and data processing services to their foreign affiliates. See chapter 1 for estimates of total jobs supported by demand for computer and information services, which includes computer and data processing services, as well as database and other information services.

⁸³ USDOL, BLS, "Computer Systems Design and Related Services," (accessed March 22, 2011).

⁸⁴ Professional computer services occupations comprise computer and information scientists, research; computer programmers; computer software engineers, both applications and systems software; computer support specialists; computer systems analysts; database administrators; network and computer systems administrators; network systems and data communications analysts; and other computer specialists. USDOL, BLS, "Computer systems design and related services" May 2009.

⁸⁵ USDOC, BLS, Occupation Employment Statistics Query System, May 2009 (accessed April 25, 2011 and May 2, 2011).

⁸⁶ US Census Bureau, "Industry Statistics Sampler" April 11, 2011.

⁸⁷ Ono, "Why Do Firms Use Temporary Workers?" March 2009.

TABLE 14 U.S. jobs supported by an additional \$1 billion of computer services output, top 10 industries, 2008

Industry	Job increases
Computer systems design and related services	3,831
Employment services	592
Wholesale trade	344
Food services and drinking places	236
Data processing, hosting, related services and other information services	228
Management, scientific, and technical consulting services	187
Services to buildings and dwellings	163
Architectural, engineering, and related services	147
Management of companies and enterprises	142
Software publishers	134
All others	366
Total	8,387

Source: United States Department of Labor, BLS, Domestic Employment Requirements Table, December 10, 2009.

over 41.2 percent from 2004 through 2008.⁸⁸ Demand for computer services also supports jobs in other computer-related industries, although to a lesser degree, such as software publishing and data processing, hosting, and other information services. Other industries that are supported by increased computer services output include wholesale trade, and food services and drinking places.

Many of the secondary employment effects (or effects outside the computer services industry) are in high-skilled industries, such as management and consulting services; architecture, engineering, and construction; and management. Perhaps surprisingly, a \$1 billion increase in demand for computer services has a relatively small effect on industries related to hardware, such as computer and peripheral manufacturing, where only 14.5 jobs were supported. This disparity in employment effects may be due to the labor intensive nature of many professional services, such as management consulting and engineering; capital intensive industries, such as manufacturing, may not require as much additional labor to meet increased demand.

Conclusions

Over the past decade the computer services industry has undergone significant change. U.S. multinationals have followed business strategies focused on geographic expansion, and as a result foreign affiliates have experienced tremendous growth. Concurrently, domestic U.S. employment among computer service workers has also continued to grow, albeit at slower rates. Demand for computer services has risen as businesses across all industries continue to incorporate increasingly sophisticated and complex technology into all aspects of their business operations. Yet the specific effects of international expansion by individual U.S. computer service firms on domestic employment remain ambiguous. Employment at some of the largest U.S. computer services multinationals has declined in recent years, but the reasons for these declines are unclear.

⁸⁸ Luo, Mann, and Holden, "The expanding role of temporary help services," August 2010, 3–16.

Within the broader universe of multinational companies, the employment effects of intrafirm exports of computer services are clearer. Increased demand for computer services appears to support a moderate number of jobs, many of which are in high-skilled, high wage industries.

4: Logistics Services

Summary

This chapter covers the logistics industry with a focus on large multinational “global integrators” such as FedEx and UPS that supply an array of shipping services, transport management services, and supply chain management services.⁸⁹ The international expansion of global integrators in recent decades was both a cause and a consequence of increased volumes of international commerce and efficiency gains in transporting information and goods. Global integrators expand abroad by constructing assets like air freight hubs and warehousing facilities, and establishing or purchasing affiliates like truck delivery services. These investments increase the scope and efficiency of international shipping operations, allowing global integrators to offer lower prices and faster delivery times to a greater number of countries.

Global integrators employ a variety of personnel at home and abroad (box 3), and foreign investment by these firms affects domestic employment in subtle ways. Building facilities abroad increases the overall capacity of the international logistics network, which requires expanding domestic hubs in order to process the greater volume of international shipments. Capacity-building employment effects can be reflected both in job growth at companies’ headquarters and in increased purchases of inputs such as fuel, information technology, and aircraft repair services, as well as complementary logistics services provided by independent contractors. There are also additional employment effects on firms that rely on fast and cost-effective international logistics services to import and export goods. Finally, international expansion may be necessary for global integrators to remain competitive. International operations account for a substantial portion of global integrators’ revenue (for example, 26 percent of UPS’s 2010 revenue⁹⁰ and 44 percent of FedEx Express’s 2010 revenue⁹¹), and a counterfactual scenario in which these firms did not invest abroad could result in their ceasing to exist.

Industry Overview

The logistics industry provides coordinated transport of goods between suppliers, intermediaries, and consumers. Raw materials, intermediate inputs, and finished goods are transported globally by logistics providers via road, rail, sea, and air, forming long and often time-sensitive supply chains. Heavy goods are generally moved by road, rail, and water, while light, high-value goods are generally moved by air. While some companies have in-house logistics capacities, many such services are supplied by third-party logistics (3PL) providers. In addition to supply chain consulting and transportation management, logistics services may also

⁸⁹ U.S. Census Bureau, “NAICS 4921: Couriers.” <http://www.census.gov/econ/industry/hierarchy/i4921.htm> (accessed March 25, 2011). Logistic service providers may be affiliated with a range of industry classification codes, including those pertaining to air, maritime, road and rail transport services; freight forwarding services; business management and consultancy services; and postal services, among others. However, for the purposes of this paper, logistic services are identified under the broad industry code NAICS 492, “couriers and messengers.” This industry code includes express delivery services and air courier services.

⁹⁰ UPS, *Annual Report 2010*, 5.

⁹¹ FedEx, *Annual Report 2010*, 63.

BOX 3 Employment categories for courier and messenger service providers

According to the Bureau of Labor Statistics (BLS), firms that fall within the “couriers and messengers” subsector include those that provide interurban and local delivery services for documents and parcels, but that do not operate under a universal service obligation. Such firms include express delivery service providers. In general, courier and messenger service firms carry out the collection, pick-up, sorting, and delivery of items; for courier firms, these activities are often performed using established IT and transportation networks. Where possible, sorting and transportation activities are mechanized to minimize labor costs. The table below provides a breakdown of BLS’ occupational data series on “couriers and messengers” for the United States.

BLS data series on couriers and messengers, 2009^a

Sub-categories	Employment	Annual mean wage
Couriers and messengers	26,010	\$25,230
Customer service representatives	9,860	\$36,680
Dispatchers (except police, fire, and ambulance)	6,190	\$39,900
First-line supervisors/ managers of transportation and material-moving machine and vehicle operators	8,950	\$60,880
Laborers, and freight, stock, material movers, hand ^b	152,580	\$24,560
Truck drivers, light, or delivery services	147,930	\$44,440

^a USDOL, BLS, “Industries at a Glance: Couriers and Messengers; NAICS 492.” (accessed April 13, 2011).

^b Refers to laborers who move items manually.

Laborers, and freight, stock, and material movers are the single largest employment category within the courier and messengers subsector.^a According to BLS data, a large number of workers in this category are employed through “employment services” agencies (see table below).^b Courier and messenger services firms therefore hire a significant proportion (53 percent) of “laborers, and freight, stock, and material movers” through employment agencies. In addition, 54 percent of “first-line supervisors/ managers of transportation and material-moving machine and vehicle operators”— a much smaller proportion of the total workforce in the courier and messenger services industry— are retained through employment agencies.

BLS data series on employment services, 2009^a

Sub-categories	Total number employed through employment services firms	Percentage contracted out to courier and messenger firms
Couriers and messengers	480	NA
Customer service representatives	85,020	12
Dispatchers (except police, fire, and ambulance)	2,670	43
First-line supervisors/ managers of transportation and material-moving machine and vehicle operators	16,460	54
Laborers, and freight, stock, material movers, hand ^b	288,460	53
Truck drivers, light, or delivery services	17,500	12

^a USDOL, BLS, “Occupational Employment Statistics: May 2009 National Industry-Specific Occupational Employment and Wage Estimates; NAICS 561300—Employment Services” (accessed April 18, 2011). In 2009, 11 percent of material movers were employed through the employment services industry as temporary or contract workers.

^a USDOL, BLS, “Occupational Outlook Handbook: 2010–11 Edition; Material Moving Occupations” (accessed April 14, 2011). BLS places these jobs under the umbrella name “material moving occupations.” There are more than ten occupational subcategories related to the movement of materials. These occupations are classified into two groups: laborers, or those that move materials by hand; and operators, or those that move materials using machinery. Of the 4.6 million jobs held by material movers in the United States in 2008, 2.3 million, or 50 percent of jobs fell within the subcategory “laborers, and freight, stock, and material movers, hand,” and 41,000, or less than 1 percent, were classified as “material moving workers, all other.”

^b Refers to laborers who move items manually.

include payment collection, product repair, transport insurance, telecommunications, trade finance, and other peripheral service activities.⁹²

The growth of the global logistics market has been driven by increasing international trade volumes, particularly imports from and exports to emerging markets; the adoption of just-in-time global supply chains, which require small, frequent, and reliable deliveries of intermediate inputs; and improved information technology, including Internet commerce, which drives demand for quick delivery of small packages to end-users. Strong logistics links between countries cause, and are caused by, increased trade: it is easier and less expensive to ship to and from countries with strong logistics markets, which lowers the total costs of imports and exports, and thereby encourages other types of investment.⁹³ Fast-growing, high-tech industries such as pharmaceuticals, medical devices, biotech, semiconductors, and electronics are especially reliant on global logistics systems.

Logistics networks are usually developed in a “hub-and-spoke” pattern, in which dispersed delivery and pickup points are connected to a few central nodes. The hubs have an enormous capacity to collect, sort, and transfer packages, and are positioned to minimize fuel costs and transit times. Customers typically take packages to drop-off points (such as a company-branded retail outlet or the U.S. post office) or use the Internet to schedule package pickups. Packages are given a tracking number and shipped by truck to a regional sorting facility. They are then usually shipped by plane to a main sorting hub (such as Memphis for FedEx or Louisville for UPS) where they are sorted by destination, shipped from the hub to the appropriate regional sorting facility, and then loaded onto trucks for delivery. This process relies heavily on information technology, including software that plans optimal routes for delivery trucks and determines the optimal placement of packages within trucks, as well as communication systems that provide information on estimated delivery times to customers.⁹⁴

The 3PL industry⁹⁵ had an estimated \$507 billion in global revenue in 2009,⁹⁶ while the express delivery industry had an estimated \$175 billion in global revenue in 2008.⁹⁷ The large multinational logistics firms most directly comparable to each other are FedEx, UPS, DHL, and TNT (table 15). These firms had a total of \$159 billion in revenue in 2009, down from \$186 billion in 2008. DHL, UPS, FedEx, and TNT respectively accounted for 40 percent, 28 percent, 22 percent, and 9 percent of that revenue. Their average 2009 profit margin was 2 percent (down from 3 percent in 2008), reflecting a range of total profits from \$363 million (DHL) to \$2.1 billion (UPS). These four firms combined had about 1,252,000 employees in 2009.⁹⁸

⁹² USITC, *Logistic Services: An Overview of the Global Market and Potential Effects of Removing Trade Impediments*, Inv. No. 332-463, May 2005, 1-3.

⁹³ UNESCAP, “The Relationship between Liberalization in the Logistics Sector and Trade Facilitation,” 2006.

⁹⁴ Cosmas and Martini, “UPS and FedEx Air Hubs,” December 14, 2007, 4.

⁹⁵ This industry is primarily composed of freight forwarders, intermodal marketing companies, distributors, and other non-asset-based companies that contract with vehicle- and equipment-owners. (“Asset-based” refers to whether a company owns the trucks, warehouses, distribution centers, or other assets used in supply chain management.)

⁹⁶ Armstrong and Associates, “Global 3PL Market Size Estimates,” retrieved October 8, 2010. \$107 billion of that revenue was in the United States.

⁹⁷ Oxford Economics, “The Impact of the Express Delivery Industry on the Global Economy,” September 2009, 5.

⁹⁸ Company annual reports, USITC calculations. This number includes FedEx’s independent contractors.

TABLE 15 Financial profile of top 4 global logistics firms, 2009

	Revenue (\$ millions)	Revenue growth over previous year (%)	Net income (\$ millions)	Employees
DHL	64,168	-15.2	363	436,651
UPS	45,297	-12.0	2,152	408,000
FedEx	35,497	-6.5	98	247,908
TNT	14,447	-6.7	390	159,663

Source: Company annual reports. DHL and TNT figures calculated using exchange rates of \$1 = 0.683 EU (2008) and \$1 = 0.720 EU (2009). FedEx employment includes independent contractors.

The growth of 3PL providers in the United States was facilitated by the deregulation of the domestic transportation industry starting in the late 1970s. In the following years, transportation prices decreased and annual ton-miles of shipped air freight increased steadily, from 4.5 billion in 1980 to 13.8 billion in 2008.⁹⁹ Integrated logistics services have expanded to the point where they are available to many small, rural U.S. communities. The widespread availability of logistics services in the United States (and other developed countries) illustrates the maturity of those logistics markets relative to rapidly developing markets in emerging economies. This has consequences for employment trends, as mature logistics markets may have less potential than emerging markets for high growth rates that could drive future job creation.

Operations of MNCs in the Logistics Industry

Logistics providers add value by providing broad international coverage. This allows them to offer a similar collection of transportation and supply chain management services to customers in foreign markets as they do at home. Logistics firms' extensive international presence also makes it easier and less expensive for domestic exporters to access foreign markets. Large global integrators typically operate in 200 countries or more, establishing air hubs as well as warehousing and storage facilities in many of them.¹⁰⁰ They also invest in trucking fleets and retail outlets, and enter into partnerships with local postal providers.¹⁰¹

According to BEA data, U.S. courier and messenger services firms (used here as a proxy for logistics firms) invested nearly \$4.0 billion in foreign markets in 2008. Countries in which U.S. courier firms invested the largest amounts include Canada (\$556 million), France (\$333 million), the Netherlands

⁹⁹ Bureau of Transport Statistics, "National Transportation Statistics," retrieved October 8, 2010.

¹⁰⁰ For example, FedEx operates 9 air hubs overseas, with the largest in Paris, France and Subic Bay in the Philippines. In 2009, the company opened a new hub at Guangzhou Baiyun International Airport, located in southern China, intended to replace Subic Bay as the company's main hub in the Asia-Pacific region. In 2010 FedEx built a new facility in Cologne, Germany, which now serves as the Express segment's primary hub for operations in central and eastern Europe.

¹⁰¹ These investments may take the form of wholly owned subsidiaries, joint ventures, or strategic alliances, depending on how logistics firms balance the desire for control over foreign operations against the value of local relationships provided by partners. For example, DHL has formed partnerships with Polar Air and Blue Dart (the latter provides domestic ground transport services in India), while FedEx purchased U.K. express company ANC Holdings in 2006, allowing the former to operate within the U.K. domestic market. FedEx followed this acquisition with the 2007 purchases of its joint venture express partner in China, DTW, and its air freight service provider in India, Prakash Air. Logistics firms also expand internationally by adding shipping routes or increasing the frequency of flights: in 1994, FedEx began express service in the U.S.-China market by taking over the Chinese air service rights of U.S. cargo carrier, Evergreen International; and in 2007, UPS added six daily flights from the United States to Nagoya (Japan) and later extended those flights further to connect with Shanghai. See Deutsche Post DHL, "Annual Report 2009," 55; "FedEx Timeline," FedEx company website. <http://fedex.com/us/about/today/history/timeline.html> (accessed October 12, 2010); "Acquisition History," FedEx company website. <http://ir.fedex.com/acquisitions.cfm> (accessed November 4, 2010); and UPS, "Annual Report 2009," 15.

(\$80 million), Switzerland (\$34 billion), and Brazil (\$33 million).¹⁰² Company-specific information for FedEx and UPS indicate that both have the highest number of foreign subsidiaries in Europe (62 and 35 respectively), and the second highest number of foreign subsidiaries in Latin America (12 and 18) (table 16). FedEx and UPS have had substantial operations in Europe since the 1980s; at that time logistics services were demanded and supplied largely within national borders, but the companies anticipated that regional integration and movement towards a single currency would increase demand for cross-border logistics services.¹⁰³ Canada ties for second place among FDI recipient countries for FedEx, where the company has established 9 subsidiaries, and ranks third for UPS (5 subsidiaries).

TABLE 16 FedEx and UPS: Number of foreign subsidiaries and employees^a

Country/Region	Number of FedEx subsidiaries	Number of FedEx employees	Number of UPS subsidiaries	Number of UPS employees
Canada	9	^b 8,227	5	^b 10,000
Asia	9	^c 14,000	12	(^d)
Europe	62	^c 13,800	35	^b 36,939
Latin America	12	^c 3,400	18	^b 1,751
Africa & the Middle East	1	^c >1,000	8	(^d)
Total	93	40,427	78	48,690

Source: BvDEP, ORBIS database (accessed November 1, 2010), and FedEx company website.

^aLatest available data.

^bORBIS database.

^cFedEx company website.

^dNot available. UPS' 2009 annual report indicates that the company employs 68,000 workers overseas, suggesting that roughly 20,000 UPS employees are dispersed among Asia, Africa, and the Middle East.

Overall Employment Trends

According to the ILO, in 2007 there were at least 72 million people employed globally in the transport, storage, and communications sector (the most specific employment category for which data were available).¹⁰⁴ The transportation and warehousing industry, which includes couriers and messengers, employed an estimated 4.2 million Americans in 2009, down from 4.5 million in 2007 but still representing an average 1 percent growth per annum since 1990.¹⁰⁵ The decrease in overall employment reflects the negative impact of the 2008-2009 economic downturn.

UPS, FedEx, DHL, and TNT have seen steady employment growth over the past decade. For these four companies, 2008 employment was on average 44 percent higher than 1998 employment.¹⁰⁶ However, the recession affected these firms as well, and their employment dropped by an average of 2 percent from 2008 to 2009.¹⁰⁷ Uniquely among these companies, TNT increased its employees from 2008 to 2009, but that increase was primarily caused by TNT's acquisition of LIT Cargo and

¹⁰² BEA, "U.S. Direct Investment Abroad on Historical Cost Basis," 2008.

¹⁰³ CSRwire, "U.S. Businesses Must Take Sustainable Approach to International Business Development," June 18, 2003.

¹⁰⁴ International Labor Organization LABORSTA database (accessed October 13, 2010). This category includes a number of industries outside of logistics, such as telecommunications and audiovisual services.

¹⁰⁵ Bureau of Labor Statistics databases (accessed October 6, 2010).

¹⁰⁶ Bloomberg databases (accessed November 10, 2010). This calculation does not include FedEx's independent contractors.

¹⁰⁷ Annual reports, USITC calculations

Aracatuba; otherwise, 1,448 employees left TNT Express in 2009.¹⁰⁸ The past decade also yielded productivity gains for these firms, as average revenue per employee increased from \$83,000 in 1998 to \$137,000 in 2008.¹⁰⁹ Among these companies, year-on-year growth in revenue per employee averaged 6.2 percent from 1998 to 2008, which compares favorably to productivity growth in the broader category of couriers and messengers in the United States. Year-on-year growth in output per employee averaged 3.5 percent for the U.S. courier and messenger industry over this period.¹¹⁰

Employment growth at these companies is partly driven by international expansion, which increases the total capacities of their logistics networks and hence requires additional hiring. Company representatives at UPS estimated that for every 22 packages per day that UPS transports across international borders, the company creates a job for one full-time equivalent employee (not necessarily in the United States).¹¹¹ Expansion also drives purchases of inputs, including real estate, IT and communications services, and air and ground fleets. In 2009, TNT Express spent \$31 million replacing the Mercurio fleet in Brazil and \$6 million on a new facility for its Middle East road network,¹¹² DHL invested \$183 million in IT equipment and \$231 million in software,¹¹³ and UPS added 300 compressed natural gas vehicles.¹¹⁴ Fleet investments can be very large; UPS operates an air fleet of 510 aircraft and a ground fleet of 101,900 vehicles,¹¹⁵ and FedEx owns or leases more than 600 aircraft and 100,000 ground vehicles.¹¹⁶ Aircraft and related equipment accounted for 55 percent of FedEx's total 2010 expenditures, followed by facilities and sorting equipment (22 percent), information technology investments (10 percent), and ground vehicles (8 percent).¹¹⁷ These input purchases are an important source of second-order job growth. One study estimates that the global express services industry supports 1.3 million direct jobs, as well as an additional 910,000 indirect jobs in aerospace, air transportation, automotive, information technology, petroleum, and professional services industries.¹¹⁸

International Employment

Employees located overseas account for a significant part of logistics firms' workforces. For example, among UPS's 408,000 employees in 2009, 340,000 were located in the United States while 68,000 were located abroad.¹¹⁹ UPS's China operations alone have reportedly grown from less than 200 employees in 2000 to 5,500 employees in 2010, with most of the new hires being Chinese nationals. FedEx has expanded its overseas express operations largely by acquiring local firms, which suggests that such operations mostly comprise local personnel, enabling FedEx to maintain the in-house expertise of the acquired firm. Similarly, one UPS official estimated in 2003 that less than 0.1 percent of UPS employees located abroad were U.S. nationals, and noted: "We've learned that everyone wins when we put international business operations into the hands of the people who

¹⁰⁸ TNT, *Annual Report 2009*, 33.

¹⁰⁹ Bloomberg databases (accessed November 10, 2010); FedEx annual reports. These calculations include FedEx's independent contractors.

¹¹⁰ BLS Labor Productivity and Costs database, accessed April 28, 2011.

¹¹¹ UPS company representatives, interview with Commission staff, Washington, DC, December 17, 2010.

¹¹² TNT, *Annual Report 2009*, 22.

¹¹³ Deutsche Post DHL, *Annual Report 2009*, 39.

¹¹⁴ UPS, *Annual Report 2009*, 5.

¹¹⁵ UPS, *Annual Report 2009*, 13.

¹¹⁶ *FedEx Annual Report, 2010*, 26. <http://www.fedex.com/us/investorrelations/> (accessed September 8, 2010).

¹¹⁷ *FedEx Annual Report, 2010*, 26. <http://www.fedex.com/us/investorrelations/> (accessed September 8, 2010).

¹¹⁸ Oxford Economics, *The Impact of the Express Delivery Industry on the Global Economy*, September 2009, 7–8.

¹¹⁹ UPS, *Annual Report 2009*, 20.

know their local cultures.”¹²⁰ When UPS employs U.S. personnel abroad, they are often working in such areas as cargo security and customs, and their positions are often short- or medium-term relocation assignments.¹²¹

International expansion by U.S. logistics firms may also result in increased employment of foreign nationals in the United States. For example, when securing a contract to provide logistics services during the Beijing Olympics in 2009 (which stimulated growth in freight shipments to and from Beijing), UPS estimated that it would increase the number of Asian nationals hired to work at its U.S. headquarters.¹²² As a company expands into new regions it can access a wider pool of potential employees, matching their skills with the company’s needs in all of its countries of operation.

Employment in the United States

The domestic employment effects of foreign investment by logistics firms are difficult to estimate. In part, this is because multinational logistics firms tend to think of themselves as global networks, and hence measure factors affecting total employment and throughput (e.g., package delivery) more carefully than they measure specific relationships between operations in one region and employment in another.¹²³ An additional challenge is that different logistics firms have different employment models: UPS truck drivers are largely UPS employees whereas FedEx truck drivers are independent contractors. Therefore, an increase in domestic employment for UPS may appear as growth in the firm’s U.S. workforce (i.e., a direct employment effect), whereas a similar increase for FedEx may correlate with the firm’s purchases of transportation services from third-party providers (i.e., an indirect employment effect) (box 4).

In 2007 the U.S. courier and messenger services industry comprised about 13,000 employer firms (with 560,000 paid employees) and 191,000 non-employer firms.¹²⁴ According to BLS data, in 2008 a \$1 billion increase in final demand for courier and messenger services supported 11,800 jobs across all U.S. industries. The top ten industries affected by demand for courier and messenger services are listed in table 17.

¹²⁰ CSRwire, “U.S. Businesses Must Take Sustainable Approach to International Business Development,” June 18, 2003.

¹²¹ UPS company representatives, interview with Commission staff, Washington, DC, December 17, 2010.

¹²² Tharpe, “For UPS Executive, Olympics a Marathon,” November 30, 2009.

¹²³ UPS company representatives, interview with Commission staff, Washington, DC, December 17, 2010.

¹²⁴ U.S. Census Bureau American Factfinder, retrieved April 28, 2011.

BOX 4 Contingent workers, independent contractors, and FedEx

According to the Bureau of Labor Statistics (BLS), independent contractors accounted for an estimated 7.4 percent of the total U.S. workforce in 2005.^a Many independent contractors are contingent workers who are employed on a temporary or non-permanent basis.^b Contingent work schedules present certain advantages to both employers and employees; for instance, contingent arrangements permit employers to adjust the number of workers they employ depending on cyclical or seasonal changes in demand. At the same time, employees have greater flexibility regarding when or how many hours they work. However, contingent workers generally receive lower wages and fewer employee benefits (e.g., healthcare and pensions) than permanent workers, placing the former at an economic disadvantage. For their part, employers may in some cases prefer contingent over permanent work arrangements because of the potential to reduce labor costs.^c

Express delivery and logistics firms like FedEx may use contingent workers, in particular independent contractors, to carry out ground delivery operations. In general, independent contractors use their own trucks, determine their own routes, and hire their own employees. FedEx employs approximately 15,000 independent contractors in its ground delivery operations. However, FedEx is currently involved in several disputes with independent contractors regarding their employment status.^d In some states, independent contractors that work for FedEx have sued the express provider claiming that they are in fact direct employees of FedEx—relying on the company for route assignments, using the FedEx logo on their trucks, and wearing the FedEx uniform. As employees of FedEx, independent contractors would be entitled to certain benefits that they do not currently receive.^e

FedEx has taken measures to address disputes with its independent contractors (or owner-operators, as they are referred to by FedEx). For example, the company has implemented a new Independent Service Provider model that requires contractors in certain states, such as Maryland and New Hampshire, to serve multiple routes within a geographic area rather than just a single route (hence avoiding single route reliance by contractors). FedEx also requires that contractors register as corporate entities under state law, and that they treat their own workers as employees. In addition, contractors must negotiate independent agreements with FedEx, rather than sign standard contracts.^f

^a USDOL, BLS, "Contingent and Alternative Employment Arrangements, February 2005," USDL 05-1433, released July 27, 2005; United States Government Accountability Office (GAO), "Employment Arrangements," GAO-06-656, July 2006, 1. Independent contractors are responsible for building their own customer base, and may have employees that work for them (e.g., real estate agents).

^b GAO defines contingent workers as those workers who "are not wage and salary workers working at least 35 hours a week in permanent jobs."

^c USDOL, Office of the Secretary "V. Contingent Workers," Special Report, n.d. <http://www.dol.gov/sec/media/reports/dunlop/section5.htm> (accessed April 13, 2011); GAO, "Employment Arrangements: Improved Outreach Could Help Ensure Proper Worker Classification," GAO-06-656, July 2006, 3. In addition, contingent workers may not be protected under labor laws designed to ensure, among other things, that employees are not discriminated against in the workplace, and that work environments meet certain safety standards. The protections granted under these labor laws apply largely to individuals who work for an employer, and therefore do not extend to independent contractors who are self-employed.

^d Litvak, Anya, "FedEx Changes Model for Independent Contractors in NH," *Pittsburgh Business Times*, January 9, 2009. <http://bizjournals.com/pittsburgh/stories/2009/01/05/daily64.html?s=print> (accessed April 13, 2011).

^e Speizer, Irwin, "The Independent Contractor Question," *Workforce Management Online*, July 2007. <http://www.workforce.com/section/recruiting-staffing/feature/independent-contractor-question/index.html> (accessed April 12, 2011). In 2002, a lawsuit brought by independent contractors against a local express delivery firm in California was settled in favor of the express firm. According to one attorney, the case resulted in several guidelines that may assist other companies to determine whether or not the independent contractors that work for them are correctly classified: (1) independent contractors must be permitted to work for other companies; (2) they must be allowed to refuse assignments from a company; (3) they must be allowed to hire others to perform work; and (4) they must have managerial control over their own operations.

^f *FedEx Annual Report, 2010*, 22. In addition to Maryland and New Hampshire, FedEx plans to implement the ISP model in Illinois, Massachusetts, Minnesota, Rhode Island, Tennessee, and Vermont.

TABLE 17 U.S. job supported by an additional \$1 billion of courier and messenger services output, top 10 industries, 2008

Industry	Job increases
Couriers and messengers	8,805
Employment services	467
Services to buildings and dwellings	197
Scenic and sightseeing transportation and support activities for transportation	190
Wholesale trade	159
Postal services	158
Management of companies and enterprises	151
Retail trade	131
Consumer goods rental and general rental centers	107
Warehousing and storage	102
All others	<u>1,333</u>
Total	11,798

Source: United States Department of Labor, BLS, Domestic Employment Requirements Table, December 10, 2009.

The BLS data show the rates at which U.S. courier and messenger firms expand their domestic workforces to manage overall increases in production. “Couriers and messengers” account for the majority of jobs created, suggesting that an increase in the total number of packages shipped globally requires more U.S. couriers and messengers to pick up and deliver such packages within the United States. “Employment services,” which accounted for the second-highest number of jobs created, include both temporary help and human resources management services. The latter category, along with “management of companies and enterprises,” are among jobs that tend to be carried out at firms’ headquarters regardless of the geographic source of demand. Other industries in which employment effects are noted reflect cross-industry partnerships: for example, courier and messenger services firms often collaborate with postal services to deliver packages, and rely on third-party as well as in-house warehousing and storage firms. While courier and messenger services firms spend a significant amount of money on commodities such as fuel and manufactures (including aerospace products), these expenditures do not result in high rates of average job creation according to BLS data. However, the category “scenic and sightseeing transportation and support activities for transportation” includes servicing and repairing existing aircraft.

Previous econometric research and company information also indicate the scope and magnitude of the U.S. employment effects of logistics firms. For instance, in a FedEx-sponsored study entitled *Global Impacts of FedEx on the New Economy* (2001), employment multipliers were calculated for each of the industries in which FedEx operates, based on input-output data from BEA. Such calculations estimated that for every 1 job created by FedEx in the United States in the year 2000, approximately 3.4 U.S. jobs were created in air transportation services; 2.9 jobs in trucking and courier services (except by air); 2.7 jobs in warehousing and storage services; and 2.8 jobs in freight forwarding and other transportation services.¹²⁵ These numbers, like the BLS data, do not illustrate a direct relationship between foreign activity and domestic job creation, but they do show the ability of successful multinational logistics firms to create “ripple effects” by generating jobs in the wider U.S. economy.

¹²⁵ SRI International, *Macro Impacts of FedEx on the U.S. & Global Economies*, 2001, 114. <http://www.sri.com/policy/csted/reports/economics/fedex/chapter5.pdf> (accessed March 25, 2011).

Employment at Firms that Rely on Logistics Networks

In addition to the above-mentioned employment effects, large logistics firms like FedEx and UPS may promote job growth at companies that rely on low-cost international deliveries. The importance of minimizing the cost and time of shipments is apparent in the number of firms that establish operations near logistics hubs. For example, FedEx has reportedly attracted 130 firms from 22 countries to its Memphis hub, resulting in an estimated 17,000 local jobs. The expansion of UPS' hub in Louisville has resulted in an additional 14,000 direct and indirect jobs in the Louisville metropolitan area. Similarly, a new hub constructed by DHL in Leipzig, Germany has added approximately 2,000 direct jobs in the area, with an estimated 7,000 direct and indirect jobs to be created in the future. Most new workers will likely come from nearby regions.¹²⁶

Access to relatively low-cost international logistics networks helps companies maintain competitiveness, enter new markets, and expand their workforces. Illustratively, in 2004, UPS and Toshiba formed a partnership in which UPS personnel became responsible for repairing as well as shipping Toshiba's laptops, which reduced total laptop repair time from an estimated 14 to 4 days.¹²⁷ Toshiba employs over 20,000 people in North America.¹²⁸ In addition, On-X Life Technologies, a medical device manufacturer, uses FedEx's shipping software and electronic trade documents to process its exports. Currently, the manufacturer exports to 80 countries and employs 100 people.¹²⁹ When international logistics services improve in quality and decrease in price, businesses that purchase those services as inputs can become more profitable and increase their output.

Conclusion

Available data from the Bureau of Labor Statistics point to some effects on job creation in both logistics industries and non-logistics related industries, such as employment services, when U.S. logistics firms expand their operations abroad. Other industries in which one might anticipate logistics firms to create substantial amounts of indirect employment—e.g., the aerospace and automotive industries—may be sufficiently productive as to absorb the relatively small employment effects created by demand for logistics services. Apart from BLS data, other research studies regarding the employment effects of large logistics firms indicate that such effects are most substantial at the location of the logistics firms' primary hubs. Both FedEx and UPS have created employment around their major U.S. hubs, as customers and suppliers of these firms locate facilities near these hubs.

There are some quantitative estimates that point towards the domestic employment effects of foreign investment by logistics firms. The BLS estimates that \$1 billion in increased final demand for courier and messenger services was correlated with the creation of 11,800 domestic jobs in 2008. Additionally, one economic impact study found that each job created by FedEx in the United States in 2000 was correlated with the creation of 11.8 jobs throughout all industries. Finally, UPS representatives estimate that one full-time equivalent position is created for every

¹²⁶ Oxford Economics, *The Impact of the Express Delivery Industry on the Global Economy*, September 2009, 31–32.

¹²⁷ UPS website, accessed April 28, 2011.

¹²⁸ Toshiba website, accessed April 28, 2011.

¹²⁹ FedEx website, accessed April 28, 2009.

22 international packages per day that UPS transports. These estimates do not draw a straight line from a quantity of foreign investment to a quantity of domestic employment, but they do illustrate and indirectly suggest the scale of the relationship between U.S. employment and the foreign activities of U.S. logistics firms.

5: Retail Services

Summary

Over the past decade, sales and employment grew rapidly at U.S. multinational retailers' foreign affiliates, whereas employment at U.S. parent firms grew only modestly. However, our research suggests that increased foreign affiliate activity may create a small number of jobs within multinational retailers' U.S. parent firms and more among their U.S.-based suppliers. It is possible that retailers' foreign expansion could also have negative effects on some workers. As retailers expand, they can demand lower prices from their suppliers in exchange for higher-volume contracts, which the suppliers might "pass on" to workers as job or wage cuts. However, we encountered no specific evidence of such effects.

Overview: An Increasingly International Business

The retail industry comprises businesses that sell merchandise in small quantities to the public.¹³⁰ Retailers sell through fixed locations as well as non-store media (e.g., catalogs or the Internet). Establishments may specialize in selling a particular type of merchandise (e.g., groceries, clothing, or hardware) or a variety of goods.

The global financial crisis and subsequent economic downturn caused global retail sales to decrease in 2009. The industry's sales revenues totaled \$14.0 trillion, down 3.4 percent from 2008. This marked a sharp reversal from the previous three years, during which annual growth of sales averaged 9.9 percent.¹³¹ The "G7" countries (the United States, Japan, France, Germany, the United Kingdom, Italy, and Canada) accounted for 45.9 percent of global retail sales in 2009, down from 55.9 percent in 2004, while the share of the "BRIC" countries (Brazil, Russia, India, and China) rose from 13.7 percent to 21.7 percent over the same period (figure 8). These statistics illustrate developing countries' emergence as the locus of growth in the global retail industry. Developing countries' share of global retail revenues has increased on the strength of economic growth exceeding that in developed countries.¹³² Their increasingly affluent consumers are spending more and demanding greater access to modern stores.¹³³

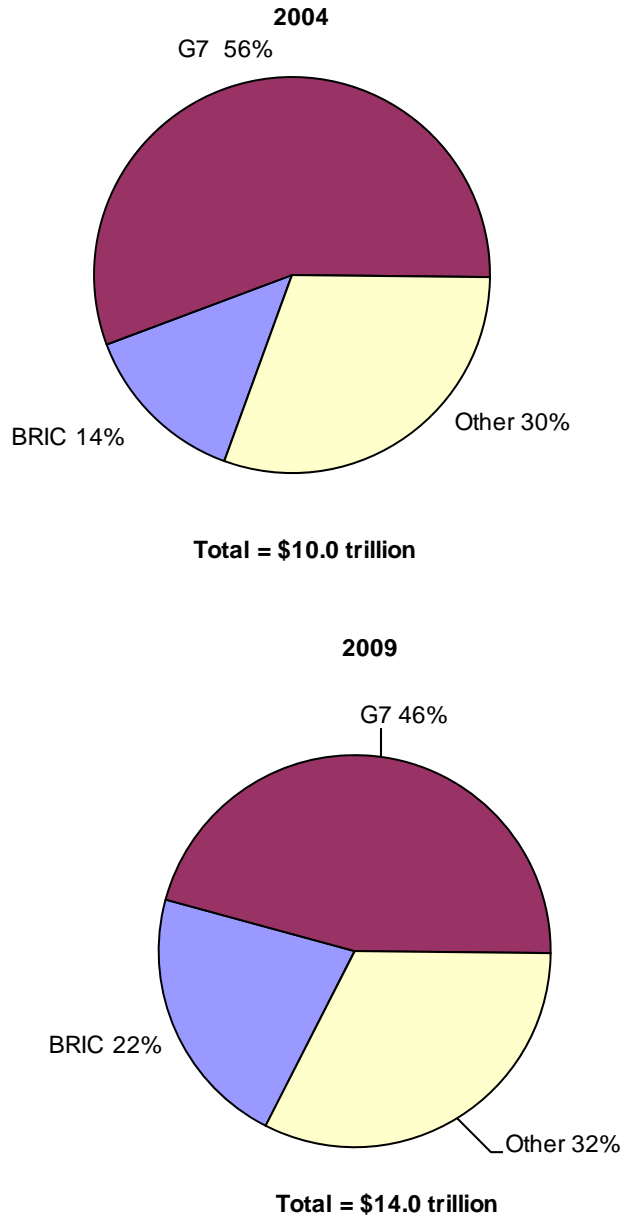
¹³⁰ U.S. Census Bureau, "2007 NAICS Definition: Sector 44–45." Retailing is one type of distribution service. Retailers typically purchase merchandise for resale rather than manufacturing the items themselves. Wholesaling, the other principal distribution service, occurs when a firm purchases merchandise that it then sells to industrial or institutional users, retailers, or other wholesalers.

¹³¹ Planet Retail, Planet Retail Database (accessed September 28, 2010).

¹³² Between 2004 and 2008, real GDP growth in economies categorized by the International Monetary Fund (IMF) as "emerging and developing" averaged 7.6 percent per year, compared to 2.4 percent in "advanced" economies. IMF, World Economic Outlook Database.

¹³³ Beinhocker, Farrell, and Zainulbhai, "Tracking the Growth of India's Middle Class," 2007, 58; Reda, "Markets with Muscle," November 2009.

FIGURE 8 Global retail sales, by country group, 2004 and 2009



Source: PlanetRetail Database (accessed September 28–29, 2010).

In 2009, all of the world's top 10 retailers were headquartered in the United States, Western Europe, or Japan (table 18). Wal-Mart is by far the world's largest retailer: its sales in 2009 exceeded those of the next three largest retailers combined. Larger retailers are more likely to operate outside their home markets,¹³⁴ but two of the global top 10, the United States' Kroger and Target, operated only in their home country.

TABLE 18 Top 10 retailers, by global retail sales, 2009

Rank	Company	Country ^a	Global retail sales (US\$ billions) ^b	Number of countries ^c
1	Wal-Mart	United States	405.0	15
2	Carrefour	France	119.9	35
3	Metro	Germany	90.9	33
4	Tesco	United Kingdom	90.4	14
5	Schwarz Group	Germany	77.2	25
6	Kroger	United States	76.7	1
7	Costco	United States	69.9	9
8	Aldi	Germany	^d 67.7	18
9	Home Depot	United States	66.2	5
10	Target	United States	63.4	1

Sources: Deloitte, "Leaving Home," January 2011; Planet Retail Database (accessed September 28-29, 2010).

^aCountry represents location of headquarters.

^bSome figures are adjusted from those reported by companies to exclude non-retail sales.

^cHong Kong counted within China. Puerto Rico counted within the United States. Taiwan counted as a separate country.

^dEstimate.

Large U.S. retailers are less internationally-oriented than their counterparts in Europe. Four of the United States' top ten retailers in 2009 (Kroger, Target, Walgreens, and CVS) operated only in the United States, and only three were present in five or more countries. (table 19).

TABLE 19 Top 10 retailers in the United States, 2009

Rank	Company	Headquarters	U.S. retail sales (US\$ billions)	Number of countries ^a
1	Wal-Mart	Bentonville, AR	304.9	15
2	Kroger	Cincinnati, OH	76.7	1
3	Target	Minneapolis, MN	63.4	1
4	Walgreens	Deerfield, IL	63.3	1
5	The Home Depot	Atlanta, GA	59.2	4
6	Costco	Issaquah, WA	56.5	9
7	CVS Caremark	Woonsocket, RI	55.4	1
8	Lowe's	Mooresville, NC	47.2	2
9	Sears Holdings	Hoffman Estates, IL	44.0	2
10	Best Buy	Richfield, MN	37.3	15

Sources: Kantar Retail, "2010 Top 100 Retailers," July 2010; Planet Retail Database (accessed September 29, 2010).

^aHong Kong counted within China. Puerto Rico and Guam counted within the United States. Taiwan counted as a separate country.

¹³⁴ Deloitte, *Feeling the Squeeze*, January 2009, G26.

However, international operations have grown increasingly important for U.S. multinational retailers in recent years. Sales by their majority-owned foreign affiliates tripled between 1999 and 2008, growing from \$59.2 billion to \$179.0 billion. Meanwhile, U.S. parent firms' sales grew by only 44 percent, from \$572 billion to \$824 billion (figure 9).

Wal-Mart exemplifies this trend. The company opened its first non-U.S. store in Mexico in 1991, but international sales remained small through most of the 1990s. In 1997, the company described its international operations as "immaterial to total company operations," and international sales for that fiscal year were less than five percent of all sales.¹³⁵ By 2010, one-quarter of the company's sales, one-third of its employees, and almost half of its stores were outside the United States.¹³⁶

Some observers have predicted that slower growth and weak consumer demand in the United States will compel more U.S. retailers to expand abroad.¹³⁷ There are signs that this is already happening. For example, in January 2010, Target announced that it would likely open stores in Canada, Mexico, or elsewhere in Latin America in the next decade.¹³⁸

Employment in the Retail Industry

Workers in the U.S. retail industry earn less and work fewer hours per week than the average U.S. worker. In January 2011, retail employees earned an average of \$15.65 per hour and worked 31.3 hours per week, compared to economy-wide averages of \$22.86 and 34.2.¹³⁹ Leading occupations include cashiers, retail salespersons, stock clerks and order fillers, and first-line supervisors.¹⁴⁰ Cashiers and retail salespersons were the largest occupations in the U.S. private sector in May 2009; together, they accounted for almost 7 percent of total private sector employment.¹⁴¹

¹³⁵ Wal-Mart, Form 10-K, April 21, 1997, 26–27. Wal-Mart's fiscal year ends January 31, so fiscal year 1997 extended from February 1, 1996 to January 31, 1997.

¹³⁶ Number of retail units from Wal-Mart, *2010 Annual Report* (online edition). Sales and employment data from Wal-Mart, Form 10-K report, 2010. Wal-Mart's fiscal year ends January 31. Sales data for 2010 are for February 1, 2009–January 31, 2010. Employment data are for the last date of the fiscal year.

¹³⁷ Deloitte, *Emerging from the Downturn*, January 2010, G11.

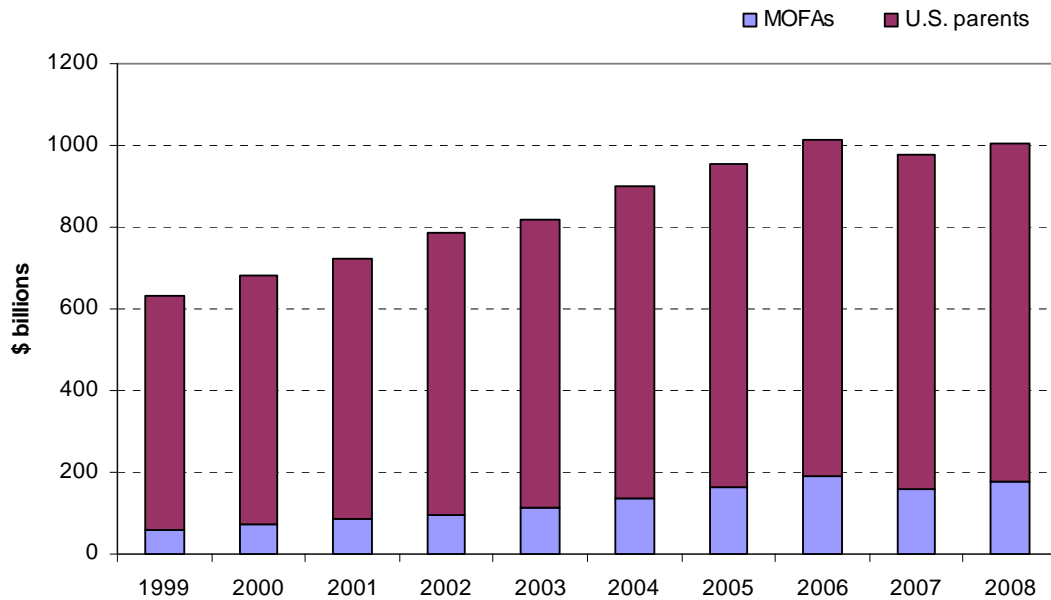
¹³⁸ Maestri, "Update 3—Target Seeks Growth from Small Stores, Overseas," January 21, 2010.

¹³⁹ USDOL, BLS, Employment, Hours, and Earnings – National Database.

¹⁴⁰ USDOL, BLS, Occupational Employment Statistics Database.

¹⁴¹ USDOL, BLS, "Occupational Employment and Wages by Ownership," July 27, 2010.

FIGURE 9 U.S. multinational retailers, sales by parent companies and by majority-owned foreign affiliates, 1999–2008

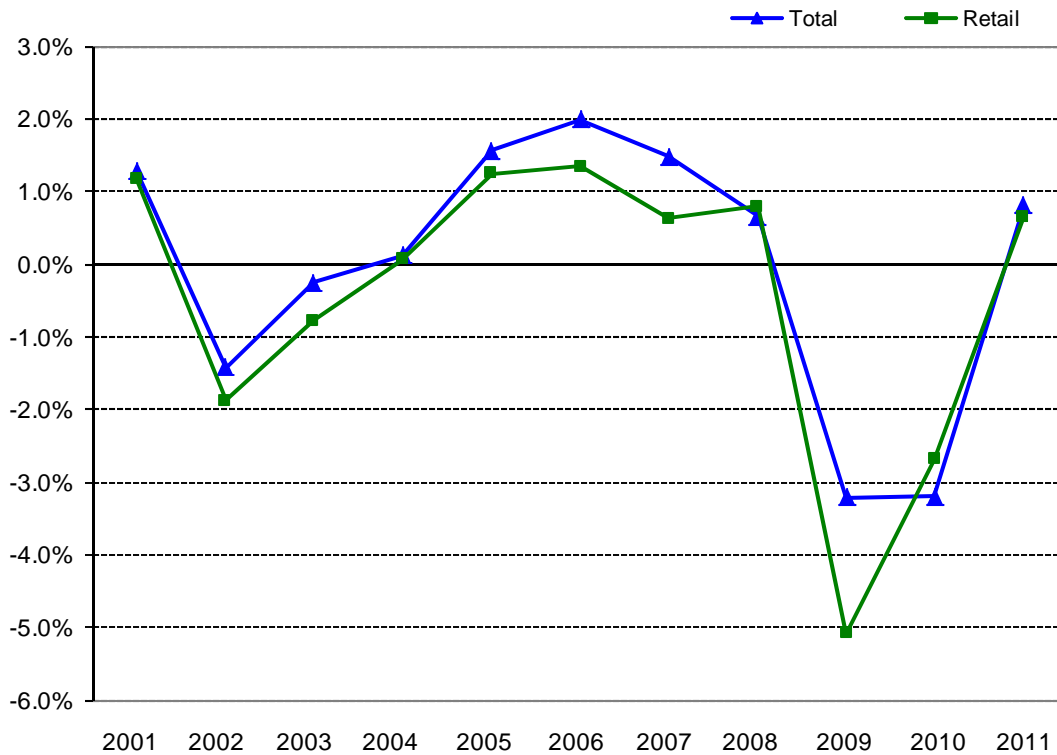


Source: USDOC, BEA, Operations of Multinational Companies Database (accessed April 1, 2011).

During the past decade, employment growth in retail was slightly lower than in the U.S. economy as a whole but followed a similar trajectory (figure 10). Retailers employed an average of 11.4 percent of workers between 2000 and 2011, and a total of 14.5 million as of March 2011. While there was no evidence of a major shift in the industry’s importance as an employer vis-à-vis other industries, its share of overall employment decreased slightly over the period—from a high of 11.6 percent in April 2000 to 11.1 percent in March 2011.¹⁴²

¹⁴² USDOL, BLS, Employment, Hours, and Earnings – National Database.

FIGURE 10 Growth of employment within the United States, 1999–2009



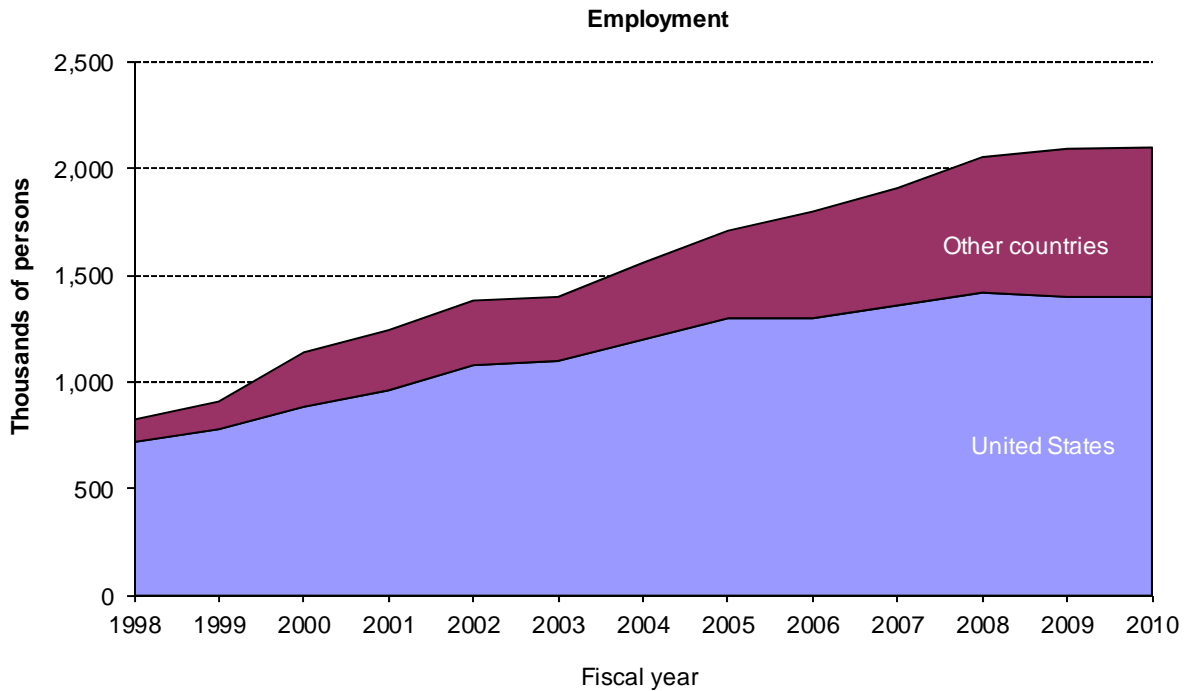
Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings – National Database. Seasonally adjusted data. Growth is calculated as year-on-year change in employment as measured in January of each year.

During the same time period, employment increased sharply among foreign affiliates of U.S. multinational retailers. These affiliates employed 538,900 people in 2000 and 960,200 in 2008, an increase of 78 percent. Growth was particularly impressive in the Asia-Pacific region, where employment increased from 37,900 in 2000 to 178,700 in 2008. Meanwhile, employment by U.S. parent firms of retail multinationals increased by a modest 4.7 percent, to just over 4 million.¹⁴³ Again, Wal-Mart’s experience is illustrative. Between 1998 and 2008, Wal-Mart’s workforce grew both outside and within the United States, although employment outside the United States grew faster. The trends diverged between 2008 and 2010, as Wal-Mart’s U.S. workforce shrunk by 20,000 while its non-U.S. workforce grew by 65,000 (figure 11).¹⁴⁴

¹⁴³ USDOC, BEA, Operations of Multinational Companies database (accessed March 31, 2011).

¹⁴⁴ Wal-Mart, Form 10-K reports, 1998–2010.

FIGURE 11 Wal-Mart employment, by location, 1998–2010^a



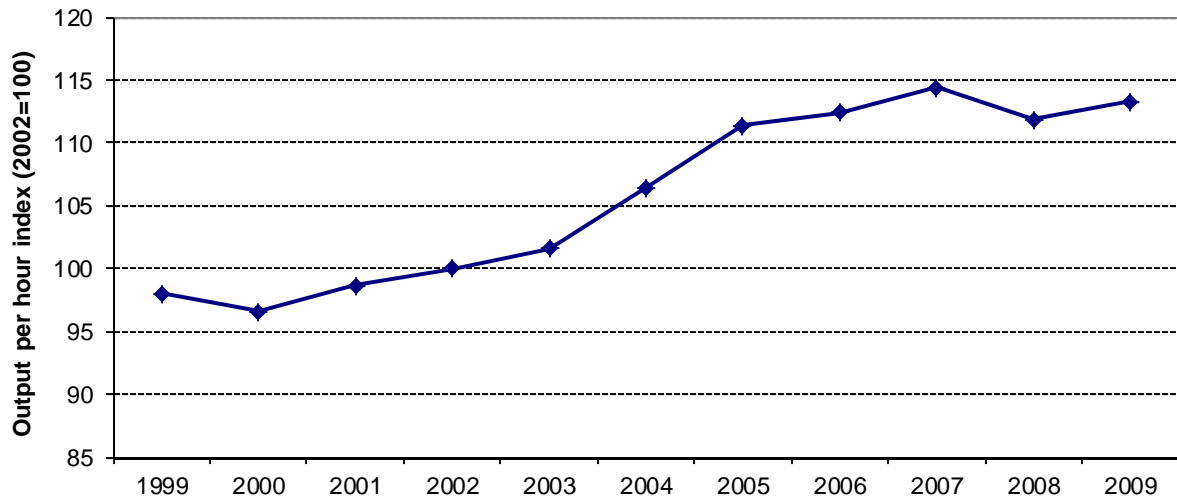
Source: Wal-Mart, Form 10-K reports, 1998–2010.

^a Wal-Mart's fiscal year ends January 31. Employment data are for the last date of each fiscal year. Employment for "other countries" is for Wal-Mart's International business segment, as defined in each year's 10-K filing. Figures for the United States include data for the Wal-Mart U.S. and Sam's Club business segments. Each part-time employee is counted as one worker. The employment figures are described as approximations in the 10-K filings.

Rising productivity may have played a role in the slow growth of U.S. retail employment over the past decade (figure 12).¹⁴⁵ These productivity gains may have been due to the adoption of new in-store technologies, such as self-checkout scanners, as well as computerized systems for supply chain management.

¹⁴⁵ The data necessary to conduct a similar analysis of productivity in affiliates were not available.

FIGURE 12 Labor productivity (output per hour), U.S. supermarkets and other grocery (except convenience) stores, 1999–2009



Source: USDOL, BLS, Labor Productivity and Costs Database.

Operations of Multinational Retailers and U.S. Employment

Multinational retailers enter new markets via new (“greenfield”) investments or acquisitions. Affiliates’ legal forms and their parent firms’ stakes in them vary, due both to host country regulations and individual companies’ preferences. For example, Costco, a U.S. operator of wholesale clubs, owns 50 percent of a joint venture in Mexico but majority stakes of affiliates in six other countries.¹⁴⁶ In contrast, Swedish home-furnishings retailer IKEA operates in 38 countries via franchise agreements.¹⁴⁷ A small but growing number of retailers also enter new markets via cross-border Internet sales. For example, in 2010, U.S. clothing retailer Gap Inc. began selling via the Internet to customers in dozens of countries where it did not have brick-and-mortar stores.¹⁴⁸

In this paper, we use the term “first-order employment effects” to describe jobs created at a multinational company’s U.S. parent firm to support operations abroad. It is difficult to make sweeping statements about the magnitude of these effects among retailers because the division of labor between retail parent companies and their foreign affiliates varies. Many functions must, by necessity, be fulfilled by staff of the affiliates or local contractors, such as in-store sales, operation of distribution centers, and local transport of merchandise. But others can be assigned to headquarters, the affiliates, or some combination of both.

For example, Wal-Mart’s Bentonville headquarters employs more than 11,000 people.¹⁴⁹ Of those, fewer than 200 work in Wal-Mart’s International Division, which oversees the company’s operations outside the United States. Some employees in other divisions, such as Information Systems and Tax, also work on international operations. Wal-Mart reserves certain functions for

¹⁴⁶ Costco, *2010 Annual Report*, December 13, 2010, i.

¹⁴⁷ IKEA, “Facts & Figures.”

¹⁴⁸ Enright, “Gap Goes Global,” August 12, 2010.

¹⁴⁹ Wal-Mart, “About Us.”

headquarters, such as decisions on real estate acquisition, and delegates others exclusively to affiliates, such as merchandising. Still other functions, such as legal services, are performed by teams at headquarters as well as affiliates.¹⁵⁰

“Second-order” effects occur when U.S. suppliers of goods and services to the retail industry create jobs in order to meet demand from retailers’ foreign affiliates. Like first-order effects, second-order effects are difficult to estimate precisely, but data from the U.S. Bureau of Labor Statistics suggest which industries might experience the largest effects. In the United States in 2008, each additional billion dollars of retail services output supported over 14,000 jobs, of which about one-fifth were in industries other than retail (table 20).¹⁵¹ Jobs were created in industries across the economy, including employment services (e.g., temporary help agencies and human resource management), wholesale trade, warehousing, finance, construction, and manufacturing (notably printing and motor vehicle parts manufacturing).

TABLE 20 U.S. jobs supported by an additional \$1 billion of U.S. retail services output, 2008, top ten industries

Industry	Job increases
Retail trade	11,474
Employment services	175
Wholesale trade	140
Warehousing and storage	139
Food services and drinking places	131
Services to buildings and dwellings	122
Real estate	113
Monetary authorities, credit intermediation, and related activities	94
Management of companies and enterprises	74
Business support services	73
All others	1667
Total	14,192

Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment Requirements Table, December 10, 2009.

It cannot be assumed that additional output by foreign affiliates has employment effects identical to those summarized above. However, some retailers draw substantially on U.S. firms to supply goods and services to foreign affiliates. For instance, numerous suppliers of merchandise have entered new markets via Wal-Mart’s foreign affiliates, while others have used those affiliates to expand sales in markets where the suppliers already had a presence. Examples include canned peaches from California, cheese from Wisconsin, and tea manufactured by Harris Tea Company. Harris has added production capacity in the United States in order to meet demand from Walmart’s stores in Japan.¹⁵² Box 5 describes the experience of one of Wal-Mart’s largest suppliers of merchandise, Proctor & Gamble.

¹⁵⁰ Company representatives, interviews with authors, Bentonville, Arkansas, September 13–14, 2010.

¹⁵¹ USDOL, BLS, *Employment Projections* (accessed May 3, 2011).

¹⁵² Company representatives, interviews with authors, Bentonville, Arkansas, September 13–14, 2010. The example of canned peaches is corroborated by U.S. Agricultural Export Development Council, “Success Story,” April 15, 2010.

BOX 5 Proctor & Gamble expands global sales through Wal-Mart^a

Proctor & Gamble (P&G) is one of the world's leading producers of consumer goods, such as cleaning supplies, personal care products, and pet food. In fiscal year 2010, the company had sales of \$78.9 billion in roughly 180 countries. Almost 60 percent of its sales came from outside North America.^b

Wal-Mart is P&G's largest single distributor. It distributes over 10 percent of P&G's products in the United States and 7 to 8 percent abroad. According to one company representative, "P&G does best where Wal-Mart is." Mexico is an example of a location where Wal-Mart has greatly expanded P&G's sales. Wal-Mart expanded rapidly in Mexico after the North American Free Trade Agreement (NAFTA) came into effect in January 1994. Wal-Mart's expansion there transformed P&G's distribution model in the country: the company moved from selling through small "tiendas" to superstores. The efficiency gains and sales growth that P&G experienced—largely through the expansion of Wal-Mart—caused the company to view retail liberalization as its single largest benefit from NAFTA.

P&G employed 50,000 people in the United States in 2008. Forty thousand of these employees worked in Ohio, the site of P&G's headquarters. A company representative said that one in five of P&G's U.S. employees works on the company's international business, and two in five in Ohio. The company representative described their work as "good headquarters jobs," in fields such as marketing, finance, and logistics.^c Using the company representative's estimates, one might associate 700 to 800 U.S. jobs at P&G with sales that the company realizes through international distribution via Wal-Mart.^d

^aUnless indicated otherwise, the source for this textbox is P&G company representative, interview by authors, January 11, 2011.

^bProctor & Gamble, "2010 Annual Report (online version)," 2010; Proctor & Gamble, Company Web site, http://www.pg.com/en_US/company/global_structure_operations/index.shtml (accessed February 4, 2011). The sales figures quoted here are for the period of July 1, 2009–June 30, 2010.

^cP&G described the impact of its international operations on U.S. employment similarly in Business Roundtable, *International Engagement*, 2008, 98.

^dTo derive this estimate, we multiply Wal-Mart's share of the international distribution of P&G products (7–8 percent) times the number of P&G's U.S. jobs focused on international business (10,000).

Another channel through which Wal-Mart may support a substantial number of jobs is procurement of materials to build and operate stores outside the United States. Company representatives described numerous links between Wal-Mart operations abroad and "green jobs" in the United States. For example, in 2008, Wal-Mart de México agreed to purchase wind energy generated by 27 wind turbines manufactured in Iowa by Clipper Windpower. In Guatemala City, Guatemala, Wal-Mart made store parking lots brighter using LED lights manufactured by General Electric in Hendersonville, North Carolina. And Schneider Electric is supplying electrical switching gear manufactured in Indiana and Iowa to every country where Wal-Mart has affiliates. U.S. suppliers of services also support Wal-Mart's international operations, in industries such as logistics and legal services.¹⁵³

It is also possible that international expansion by multinational retailers is associated with some negative effects on U.S. employment. As retailers grow larger—internationally or domestically—they gain leverage vis-à-vis suppliers with respect to prices. For example, Costco grew rapidly over the past decade¹⁵⁴ and was the world's seventh-largest retailer in 2009. In November of that year, it temporarily stopped restocking Coca-Cola products in an effort to compel Coca-Cola

¹⁵³ Clipper Windpower, "Clipper Windpower and EDF EN," August 5, 2008; Company representatives, interviews with authors, Bentonville, Arkansas, September 13–14, 2010.

¹⁵⁴ Costco's operating revenue more than doubled between 2001 and 2008. Bureau van Dijk, Orbis database (accessed August 4, 2011).

to supply those products at lower prices.¹⁵⁵ Such demands place downward pressure on suppliers' margins, which the suppliers could pass on to workers in the form of wage or job cuts. On the other hand, suppliers may need to hire more workers to meet the greater demand associated with larger sales contracts. The net effects are ambiguous *a priori*.

Wal-Mart provides another example. In January 2010, the company announced that it would "leverage its global scale" to reduce the costs of merchandise. The company planned to increase its use of direct contracts with producers for goods marketed under its store brands.¹⁵⁶ Observers reported that the company was seeking to reduce its dependence on intermediaries (such as produce wholesalers) and consolidate purchases by the company's various foreign affiliates.¹⁵⁷ It is possible that this strategy could negatively affect the financial performance, and ultimately employment, at intermediary firms. However, it is also possible that job losses at wholesalers could be matched or exceeded by gains among suppliers. Additional empirical evidence is needed to assess the net employment effects of this and other initiatives by multinational retailers to cut supply chain costs.

Directions for Future Research

The data examined in this chapter suggest that international expansion by multinational retailers may create jobs within the United States—a modest number within the retailers' U.S. parent firms and more among U.S. suppliers of their foreign affiliates. But the exact balance of job gains and losses is unclear, particularly among suppliers. Additional research could help clarify the relationship between retailers' foreign activities and U.S. employment. Useful directions for this research include:

- Examining, via a survey or case studies, the extent to which multinational retailers employ headquarters staff to manage foreign affiliates, and the extent to which the retailers procure U.S.-produced goods and services for their affiliates.
- Interviewing or surveying additional suppliers about the effects of multinationals' international activities on the suppliers' production and employment decisions.
- Analyzing firm-level data on retailers' employment in the United States and abroad. Econometric techniques could prove useful for this analysis.

¹⁵⁵ Timberlake and Stanford, "Costco Stops Restocking Coca-Cola Products," November 16, 2009.

¹⁵⁶ Wal-Mart, "Walmart Leverages Global Scale," January 28, 2010.

¹⁵⁷ *Supply Chain Digest*, "Walmart to Centralize Global Sourcing," January 6, 2010.

Conclusion

Our research indicates that the foreign activities of U.S. multinational services companies have varying effects on domestic employment when examined on an industry-by-industry basis, but in aggregate result in net job creation. Much of the support for domestic employment results from increased exports of services from parent firms to the affiliates in support of their foreign operations. We estimate that U.S. multinationals' intrafirm exports of services in 2008 supported nearly 700,000 U.S. jobs, including jobs at U.S. parent firms as well as these firms' suppliers.

However, this figure likely underestimates the job effects of services multinationals' foreign activities. It does not account for intrafirm exports of goods, which are significant even among services firms. In addition, it does not account for a possible "third-order" employment effect among unrelated U.S. MNCs operating in the same foreign markets as the services multinationals. The services provided by the affiliates of U.S. services multinationals may enable other U.S. MNCs to expand abroad more rapidly, thereby boosting their own U.S. headquarters employment. We have not attempted to quantify such third-order employment effects in this paper, but discussions with industry representatives suggest that they could be substantial.

In examining the banking, computer services, logistics, and retail services sectors, we found a number of factors and compelling trends that support our data and econometric analyses presented in chapter 1. Key findings include:

Banking

- In the wake of the global financial crisis, U.S. multinational banks are increasingly looking to grow affiliate operations in developing markets where economic activity is more robust, disposable incomes are increasing, and demand for more sophisticated banking services is high.
- Employment at bank affiliates tends to complement that of the parent firms, and likely provides a small positive effect on headquarters employment, as well as a more substantial positive effect throughout the domestic supply chain.
- Intrafirm exports of services from U.S. banks to their foreign affiliates likely supported over 45,000 jobs across a variety of sectors in 2008.

Computer services

- The widespread adoption and integration of technology into business operations has generated global demand for computer services, driving U.S. computer service multinationals to establish foreign affiliates around the world, particularly in emerging markets, to supply this growing demand.
- Although it is likely that international expansion by U.S. computer service multinationals supports at least a small number of jobs at U.S. headquarters, U.S. employment by these firms has followed a slight downward trend over the past decade. However, it is not clear to what degree this is attributable to foreign expansion rather than shifting employment patterns or technological disruption.

- More broadly, intrafirm exports of computer services by all U.S. multinational firms appears to support a moderate number of high-skilled, high wage domestic jobs – roughly 23,500 in 2008.

Logistics

- Logistics firms often invest abroad to expand their international coverage and increase their total network capacity. The domestic employment effects of these investments are difficult to measure given the global nature of logistics firms' operations, as well as their use of different employment models and the lack of employment data that capture such effects.
- As logistics firms grow and expand, the areas surrounding their U.S hubs tend to experience employment gains due to customers and suppliers of these firms locating facilities near such hubs.
- Quantitative estimates that suggest the scale of the relationship between U.S. employment and the foreign activities of U.S. logistics firms (while not directly measuring this relationship) include:
 - The U.S. Bureau of Labor Statistics estimated that a \$1 billion increase in final demand for courier and messenger services likely supported 11,800 domestic jobs in 2008;
 - One economic impact study found that each job created by FedEx in the United States in 2000 was correlated with the creation of 11.8 jobs throughout all industries; and
 - UPS representatives estimate that one full-time equivalent position is created for every 22 international packages per day that UPS transports.

Retail services

- Developing countries have emerged in recent years as the locus of growth in the global retail industry, with their share of global retail revenues increasing on the strength of economic growth exceeding that in developed countries. Their increasingly affluent consumers are spending more and demanding greater access to modern stores.
- Over the past decade, sales and employment grew rapidly at U.S. multinational retailers' foreign affiliates, whereas employment at U.S. parent firms grew only modestly. Our research suggests that increased foreign affiliate activity may create a small number of jobs within multinational retailers' U.S. parent firms and more among their U.S.-based suppliers.

Further research

There is a great deal of additional research that needs to be done in order to better understand and quantify the wider domestic employment effects of establishing services affiliates abroad. Some potential research avenues include:

- A more detailed examination of the second-order employment effects throughout services MNCs' supply chains
- The extent to which third-order effects generate increased domestic employment

- Whether first- and second-order domestic employment effects change with the duration of affiliate operations.

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Appendix

TABLE A.1 Estimated number of jobs supported by intrafirm exports of services by multinational companies, 2008: detailed calculations

Services exported by parent firms of U.S. multinational companies	Corresponding BEA International Surveys Industry (ISI) codes ^a	Corresponding BLS categories ^b	NAICS codes covered by BLS categories	Jobs supported per \$1 billion of demand, 2008	Intrafirm exports of services by U.S. multinational companies (\$ billions), 2008	Jobs supported by intrafirm exports of services by U.S. multinational companies ^c
Computer and information services	5415	Computer systems design and related services	5415	8,387	3.247	23,395
	5182, 5191	Data processing, hosting, related services, and other information services	518, 519	6,023		
Management and consulting services	5416	Management, scientific, and technical consulting services	5416	9,312	16.467	153,342
R&D and testing services	5417	Scientific research and development services	5417	7,240	8.014	58,024
Operational leasing	5321	Automotive equipment rental and leasing	5321	6,984	1.979	18,856
	5329	Consumer goods rental and general rental centers	5322, 5323	14,069		
	5329	Commercial and industrial machinery and equipment rental and leasing	5324	7,531		
Construction, architectural, and engineering, services	5413	Architectural, engineering, and related services	5413	8,943	0.814	7,280
	8110	Electronic and precision equipment repair and maintenance	8112	8,787		
Installation, maintenance and repair		Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	8113	9,603	0.847	8,371
Legal services		Personal and household goods repair and maintenance	8114	11,260		
	5411	Legal services	5411	6,973	0.063	439
Advertising	5418	Advertising and related services	5418	8,303	not available ^d	
Financial services	5221	Monetary authorities, credit intermediation, and related activities	521,522	5,579	8.376	45,799
	5231	Securities, commodity contracts, and other financial investments and related activities	523	5,357		
	5331	Lessors of nonfinancial intangible assets (except copyrighted works)	533	2,166		
Royalties and License Fees	5111	Newspaper, periodical, book, and directory publishers	5111	8,248	60	367,739
	5112	Software publishers	5112	5,283		
	5121	Motion picture, video, and sound recording industries	512	7,718		
	5151	Broadcasting (except internet)	515	7,336		
	517	Telecommunications	517	5,113	2.698	13,794
Total						697,038

Source: USDOC, BEA, Survey of Current Business, (October 2010), 36-55; and USDOL, BLS, Employment Projections, http://www.bls.gov/emp/ep_data_emp_requirements.htm (accessed May 3, 2011).

^aInternational Surveys Industry classifications are used by respondents to BEA surveys on foreign direct investment and services. ISI codes are adapted from the 2007 North American Industry Classification System (NAICS).

^bBLS classifications do not have exact matches among the BEA ISI codes in all cases. In cases where the BLS codes are broader than the corresponding ISI codes, employment effects may be overstated.

^cTo calculate the values in this column, we multiply the jobs supported by an additional \$1 billion of demand for each service in 2008 by intrafirm exports of that service in 2008. For services with more than one corresponding category in the BLS data, we multiply the value of intrafirm exports by the simple average of the jobs supported by \$1 billion of demand for each category. For example, intrafirm exports of computer and information services totaled \$3.247 billion in 2008. We multiply this by the average of the number of jobs supported by \$1 billion of demand for computer systems design and related services (8,387) and data processing, hosting, related services, and other information services (6,023): $(8,387+6,023)/2 \times 3.247 = 23,395$. Averaging is done to account for the fact that the exports are composed of some combination of the services named in the corresponding BLS categories (the exact composition is not specified in the available export data).

^dData not released by BEA.