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Distinctive Patterns & Prospects in China-Latin: America Trade, 1999-2005

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Abstract

This paper examines significant China-Latin America trade patterns that have emerged between 1999 and 2005, and assesses implications of these developments on these trading partners' future economic relationship. We show that China's iron, copper, and soybean imports from Latin America have become increasingly concentrated; that China and Latin America are rapidly becoming interconnected on telecommunications and computer manufacturing supply chains, with China supplying parts for assembly in Latin America; and that Chinese-made electronic and textile consumer goods have rapidly penetrated Latin American markets. The implications of our findings suggest that while there are many benefits of deeper economic integration to both sides, the vulnerabilities are likely to be predominantly borne by China's Latin American trading partners.

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Introduction

China's merchandise trade balance with Latin America fell from a $2.2 billion surplus in 1999 to a $3.3 billion deficit in 2005. While the magnitude of bilateral trade remained small relative to China's global trade flows,[2] it has represented an increasingly important source of economic growth for many Latin American countries. Moreover, the progressive widening and restructuring composition of China's trade deficit with Latin America since 1999 are suggestive of important new trade phenomena that warrant deeper analysis.

Our objective is to understand emerging trade patterns between China and Latin America since the acceleration of their bilateral trade flows starting in 1999, and to identify possible implications of such developments on these trading partners' future economic relationship. Using highly disaggregated trade data from official Chinese and Latin American sources,[3] we identify the following prominent trade patterns:

Key Trade Patterns

Commodity trade

China's imports from Latin America have become increasingly concentrated in a few commodities —iron, copper, and soybeans— which have helped fuel China's rapid industrialization and rising standards of living. Latin American firms have recently benefitted from quantity and price increases associated with growing demand from China as a dominant global purchaser. Moreover, increased trading among Chinese and Latin American state and para-statal enterprises, as well as volatility in global commodity markets, have added new dimensions to the evolving trade relationship.

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[2] China's exports and imports to/from Latin America constituted a 3-4 percent share of its global trade flows between 1999 and 2005.

[3] As reported through the World Trade Atlas at the 8-digit Harmonized System (HS) level of classification. Analysis was primarily conducted on Chinese official data, given the need for a consistent, highly detailed set of information.

Global supply chain integration

China and Latin America have become increasingly integrated on global supply chains, particularly in the manufacturing of electrical products, such as mobile phones and computers. China's fastest growing exports to the region are "parts for assembly" for Latin American factories. This trend is differentiated from China's well established supply chain relationships in East Asia, where China has typically remained at the final stage of the assembly process (Bergsten et al. 2006, 89).

Consumer goods

China's other dominant exports—cheap electronic and textile consumer goods—have also recently surged on Latin American markets, and have helped meet growing demand from an increasingly prosperous Latin American consumer base.

Implications

China and Latin America will likely become more economically integrated in years to come. First, the rapid acceleration of China-Latin America trade is broadly reflective of China's emergence as a dominant actor in global trade, and of Latin America's ability to adapt and take advantage of China's economic expansion. Second, China-Latin American trade is mostly complementary in nature, based on the two sides' contrasting resource endowments. While there are exceptions to this—most notably in Mexico and Panama where competition from China has challenged labor-intensive, export-oriented textile industries—basic Heckscher-Ohlin principles nevertheless generally prevail. Third, the volume of bilateral trade remains relatively small thus far, leaving considerable room for growth. Finally, both China and Latin America represent growing economies that are likely to exhibit sustained demand for the products that currently dominate bilateral trade.

Many actors stand to benefit from deeper bilateral economic integration, including sellers of Latin American raw materials, certain Latin American telecommunication and computer manufacturers, Latin American and Chinese consumers, and Chinese primary goods importers. Latin America's disproportionate increase in exports, however, suggests that its economies may be more susceptible to risks associated with deeper bilateral economic integration.

Paper Structure

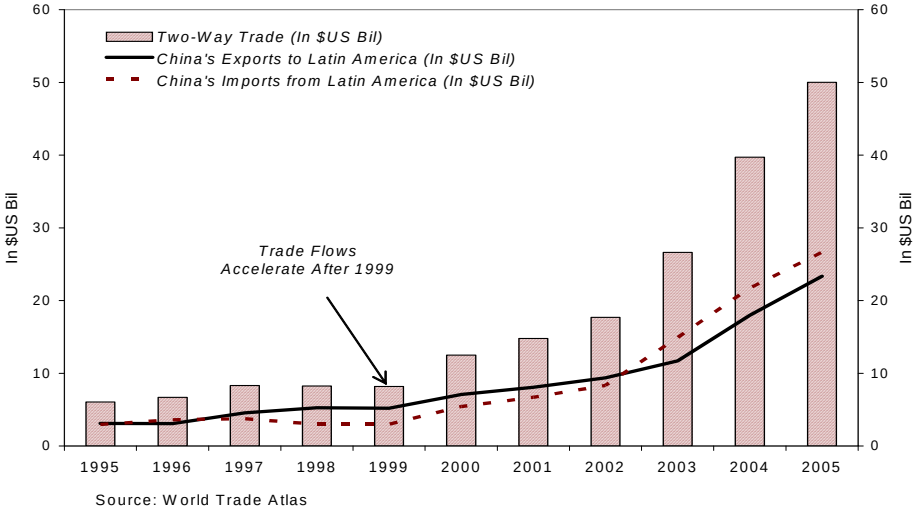
Part II exposes overarching patterns in China-Latin America bilateral trade. Part III then decomposes China's imports from Latin America according to country, commodity, and country-commodity sources. Using a similar methodology, Part IV subsequently describes unfolding patterns in China's exports to Latin America. The final section adds context to our findings by highlighting future benefits and vulnerabilities associated with China-Latin America economic integration.

China-Latin American Bi-Directional Trade Flows

Trends

China's trade balance with Latin America fell from a $2.2 billion surplus in 1999 to a $3.3 billion deficit in 2005. As seen in figure 1, China's trade with Latin America accelerated after 1999, largely as a result of (1) China's increased market liberalization reforms in light of its impending 2001 accession to the WTO; (2) China's 1999-2003 construction boom, when consumption of

Figure 1 China's Trade with Latin America, 1995-2005



construction materials and imports of primary products surged;[4] and (3) decreases in real raw material import prices China faced vis-à-vis Brazil—Latin America's largest economy—in the aftermath of Brazil's substantive 1999 and 2002 devaluations.[5]

China as a Rising Trade Partner

Since the beginning of the millennium, China has become a significant trading partner to all of Latin America's largest economies, joining the United States, Europe and other neighboring Latin American trading partners. While partially attributable to China's growing influence in global trade,[6] China's rapid entry into the list of top Latin American trading partners constituted one of the few significant changes in Latin American trade patterns in recent history. Brazil and Mexico's top five trading partners, for example, remained relatively unchanged from 1995 to 2005, with the exception of China as a rising trade partner. While the United States has maintained its position as the most dominant trading partner in most of Latin America's countries, China's rapid growth has put it firmly into second or third place.

China's Major Latin American Trading Partners

Figure 2 highlights China's bilateral trade position vis-à-vis its largest Latin American trading partners in 1999 and 2005. China's growing trade deficit with Latin America has been primarily driven by its bilateral deficits vis-à-vis Brazil, Chile, and Argentina. In 2005, these deficits collectively amounted to $10.4 billion. In 2005, China's growing trade deficit with Brazil, Chile, and Argentina was partially offset by its $6.4 billion merchandise surplus with Mexico and Panama. Moreover, those Latin American countries that had a deficit vis-à-vis China in both years had greater deficits in 2005 compared to 1999, while those Latin American countries that had surpluses vis-à-vis China in both years had greater surpluses in 2005 relative to 1999.[7]

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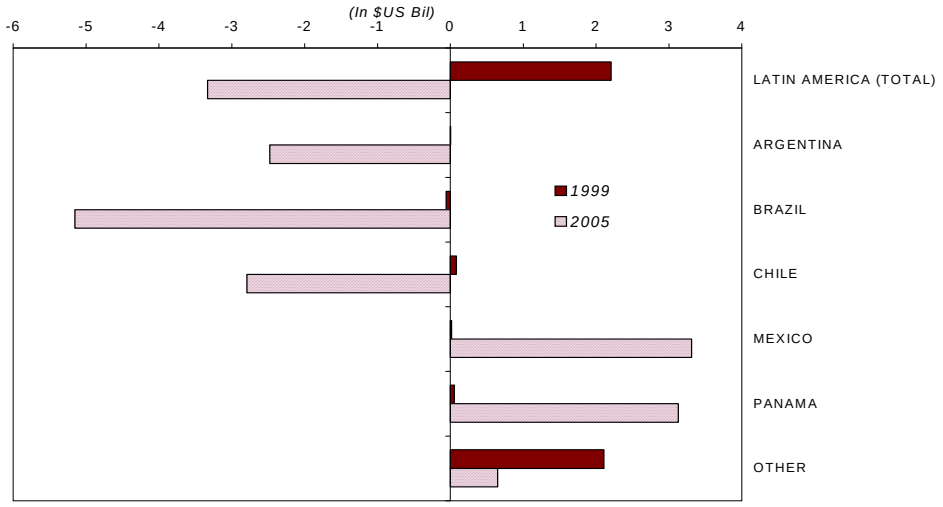
[4] Based on construction starts, construction material consumption, and imported primary goods data collected from China's Bureau of Statistics.

[5] Since China's exchange rate vis-à-vis the U.S. dollar was fixed during this period, changes in the yuan-real rate were reflective of changes in the dollar-real rate.

[6] China has recently surpassed Japan as the world's third largest trading country.

[7] The only exception to this was Chile. Surges in Chinese demand for Chilean copper after 1999 greatly contributed to China's growing bilateral trade deficit with Chile by 2005.

Figure 2 China's Bilateral Trade Positions In Latin America, 1999 and 2005



Source: World Trade Atlas

The Commodity Source of China's Trade Deficit with Latin America

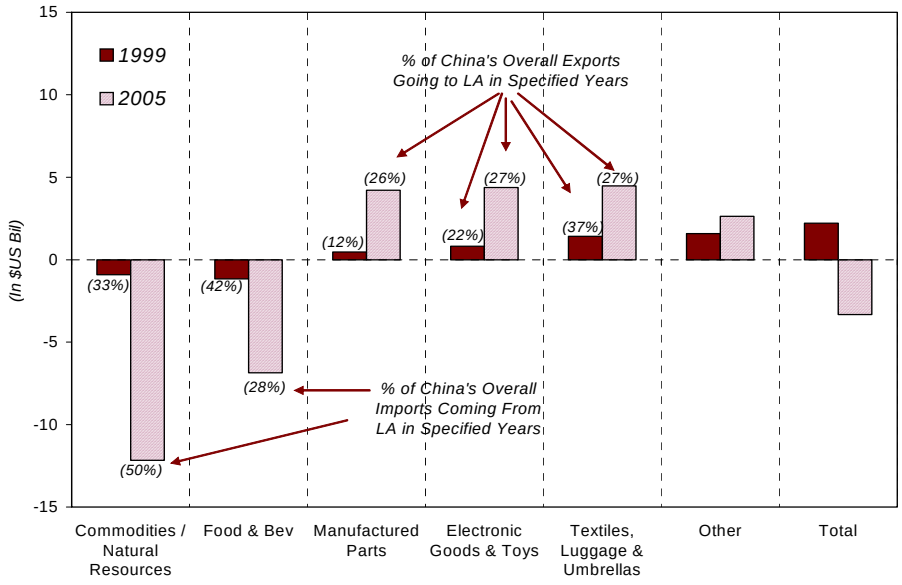
To identify what commodities have driven bilateral trade flows between China and Latin America, we decompose those flows into categories that broadly account for the most substantive portions of trade. The results can be seen in figure 3, which consolidates the top 300 Harmonized System's product categories (at the 8-digit level) traded between China and Latin America. As can be seen, China is not only trading manufactured parts, electronic goods, and textiles to Latin America in exchange for natural resources and food, but the magnitude of this trend has substantially grown since 1999, which help explains China's growing bilateral deficit with resource-rich Latin American countries.[8]

Asymmetric Influence

While China's trade with Latin America has accelerated in recent years, China's exports and imports to that region only represented 3 percent and 4 percent of its global exports and imports in 2005. Latin American countries, in contrast

[8] For a similar approach, see Economic Commission for Latin America & Caribbean December 2005.

Figure 3 The Commodity Composition of China-Latin America Trade, 1999 and 2005



Source: Based on aggregations of the top 300 traded HS-8 digit products (from the World Trade Atlas).

view China as an increasingly dominant trading partner. This imbalance in perspectives makes the economic impact of bilateral trade more significant to the individual Latin American economies, and less significant to China's economy.

Latin American's two largest economies, Mexico and Brazil, best exemplify this point. For Mexico, China is its second largest source of imports after the United States, having recently replaced its traditional partner Brazil. For Brazil, China is close to replacing Argentina and Germany as its second largest source of imports.[9] Although Mexico and Brazil are China's largest export markets in Latin America, Mexico is only China's 23rd largest export destination, and Brazil is its 24th.

[9] For the first 9 months of 2006, imports from China represented Brazil's 3rd largest country source (just behind Argentina).

China's Imports from Latin America

Context

Since 1999, China's import market has undergone a subtle, yet important transformation. While it was still predominantly dependant on imports from Asia (67 percent), Europe (11 percent) and the United States (7 percent) by 2005, the market has been increasingly influenced by robust growth from some of China's non-traditional trading partners. As seen in table 1, in decreasing order of magnitude, Asia, the Middle East, Latin America, and Africa have exhibited growth in their shares of China's import market since 1999, at the expense of both Europe and the United States. When crude oil is removed from these calculations —to remove the effect of global oil price increases — Asia and Latin America are shown to have contributed most positively to China's import market since 1999.

TABLE 1 Sources of Growth in China's Import Market, 1999 & 2005

Region	Level ($US Mil)		Share of China's World Imports (%)		Mkt-Share Change (%)
	1999	2005	1999	2005	1999-2005
Asia	102	442	62	67	5.1
Middle East	4	32	2	5	2.6
Excl. crude oil	*1*	*9*	*1*	*1*	*0.6*
Latin America	3	27	2	4	2.2
Excl. crude oil	*3*	*25*	*2*	*4*	*2.1*
Africa	2	21	1	3	1.8
Excl. crude oil	*1*	*6*	*1*	*1*	*0.1*
Other	9	16	5	2	-3.0
United States	19	49	12	7	-4.4
Europe	26	74	16	11	-4.4
World	166	660	100	100	0.0

Source: World Trade Atlas.

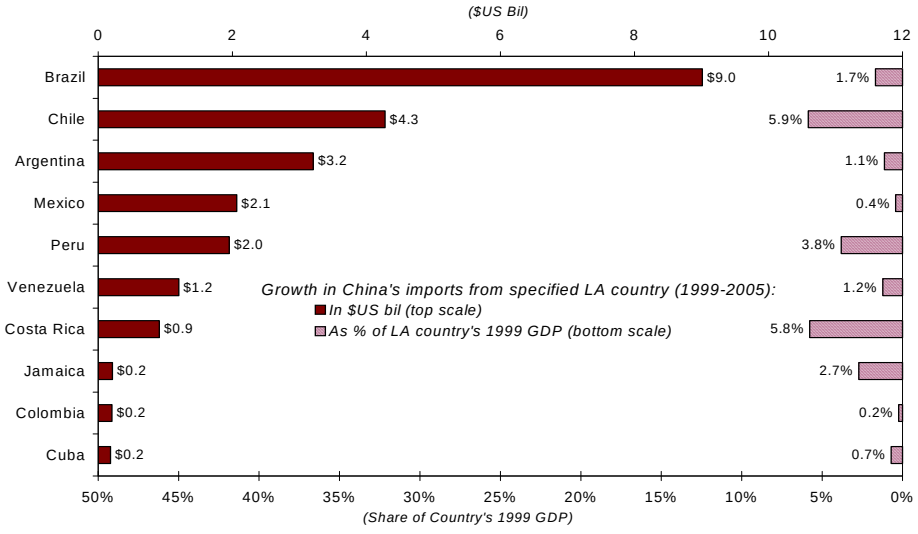
These developments illustrate two different phenomena. The first relates to Asia's large and growing dominance in China's import market, attributable mostly to other Asian firms sending intermediary parts for assembly into China for re-exportation. The second, which is central to our analysis, is the rapid growth of China's non-oil imports from Latin America, mostly in the form of raw materials being used to fuel China's dynamically growing economy.

By-Country Decomposition of China's Import Growth from Latin America, 1999-2005

China's imports from Latin America grew from $3 billion in 1999 to $27 billion in 2005, and represented 2 percent and 4 percent of China's import market in 1999 and 2005, respectively (see table 1). Imports from Latin America primarily derived from Brazil (38 percent of China's total Latin American imports), Chile (19 percent), and Argentina (14 percent) in 2005, and that composition has remained broadly unchanged since 1999.[10] Figure 4 shows the largest sources of China's import growth from Latin America between 1999 and 2005, and provides context by showing these gains relative to the individual Latin American countries' 1999 GDP levels. As can be seen, increased Latin American trade with China between 1999 and 2005 was the greatest relative to Chile, Costa Rica, and Peru's respective 1999 GDP levels.

China's increasing demand for soybeans, iron ore, and copper from Latin America, is consistent with China's increasing global demand for these commodities. For example, China's demand for soybeans — a land-intensive agricultural commodity that is difficult to grow domestically— currently accounts for 40 percent of world soybean imports, and is primarily used to

Figure 4 China's Import Growth from Latin America, 1999 and 2005



Source: IMF's *International Financial Statisitics;* and the World Trade Atlas.

[10] With the exception of Argentina, whose share of China's imports from Latin America fell from 20 percent in 1999 to 14 percent in 2005.

satisfy increased Chinese demand for meat products[11]. China is also the world's first (42 percent in 2004) and second largest (19 percent) importer of iron ore and copper, respectively. Iron ore is being sought in great quantities in China, to support steel production for the countries' booming construction sector, while copper is mainly used as an input in electrical products (e.g. wires, conductors in integrated circuits) and metal products (e.g. pipes, tubes, machine tools).

Table 2 identifies the major commodities (soybeans, iron ore, and copper) that led Chinese import growth from Latin America between 1999 and 2005. The table also shows that relative to 1999, China's 2005 imports of these commodities have become increasingly concentrated. To more accurately test China's deepening import concentration levels from Latin America, Herfindahl-Hirschman Index (HHI) was constructed using China's top 50 HS-8 digit imported commodities in 1999 and 2005.[12, 13]

As can be seen in figure 5, not only are China's imports from Latin America becoming more concentrated, but China's global imports are following the same trend (albeit at a slower pace). While China's imports from Latin America are more concentrated than its world imports, the discrepancy has notably widened over the course of only six years.[14] China's imports from Latin America have been less concentrated than China's imports from the Middle East and Africa (mostly world imports, the discrepancy between Latin America and the rest of the world has due to price and volume affects associated with China's crude oil imports). China's imports from Latin America have been more concentrated than its imports from the EU, OECD, U.S., East Asia, and, interestingly, the world's "least developed countries".

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[11] Soybeans are crushed into soy meal, which is in turn used to feed the livestock used for human consumption.

[12] $HHI = \sum_{i=1}^{50} S_{ij}^2$ where:

s = Share of China's imports from Latin America;
i = China's top imported commodities (at the HS-8 level of classification); and
j = China's Latin American or world imports

[13] Similar results were found using more aggregated HS commodity listings.

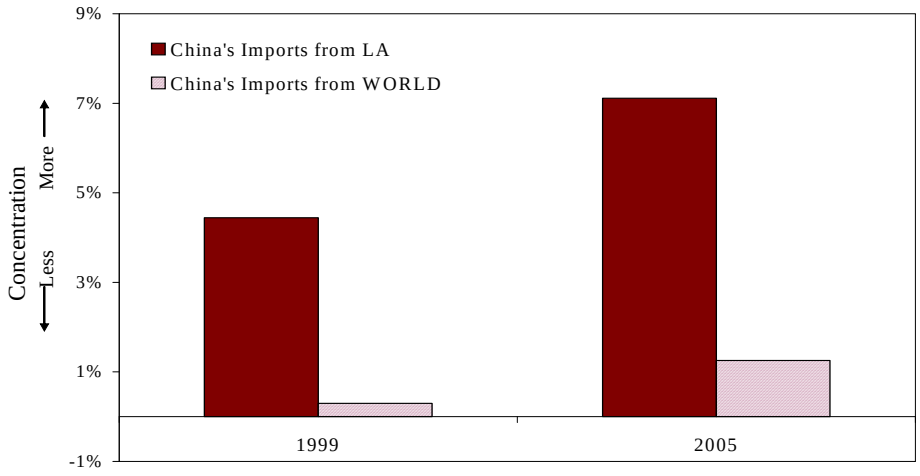
[14] These conclusions are broadly consistent with similar HHI calculations done at more disaggregated levels of classification.

TABLE 2 China's Commodity Imports From Latin America, 1999 and 2005 (billions US dollars)

	1999	2005	Difference	Difference as % of total export growth
Yellow soya beans	308	4,612	4,304	18
Non-agglomerated iron ores & concentrates	262	3,748	3,485	15
Copper ores & concentrates	162	2,257	2,095	9
Copper cathodes & sections of cathodes	204	2,160	1,957	8
Agglomerated iron ores & concentrates	109	888	782	3
Flours/fish meal, used in animal feeding	215	929	722	3
Crude soya-bean oil	228	871	643	3
Molybdenum ores & concentrates	7	453	446	2
Aluminum oxide, o/t artificial corundum	8	307	317	1
Semi bleached chemical wood pulp	99	386	286	1
Top 10 total	**1,602**	**16,611**	**15,037**	**63**
In percent of total imports	*54*	*62*	...	...
Other China imports from LA	1,389	10,062	8,645	...
In percent of total imports	*46*	*38*	...	...
Total China Imports from LA	**2,991**	**26,673**	**23,682**	...

Source: World Trade Atlas.

Figure 5 Concentration of China's imports, 1999 and 2005



Source:World Trade Atlas; Calculations based on computed Herfindahl-Hirschman Index, Top 50 8-Digit commodities.

By-Country/By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

The preceding sections identified Brazil, yellow soybeans, and iron ore as the principle sources of Latin America's robust export growth to China since 1999, though they have not necessarily implied that these developments were related. Table 3 below combines our findings to identify by-country, by-commodity drivers behind Latin America's exports to China. As can be seen, Brazilian iron ore and soybeans represented 20 percent of Latin America's overall export growth to China from 1999 to 2005. Meanwhile, yellow soybeans from Argentina, and copper from Chile also represented important growth drivers. All in all, the top 10 by-country, by 8-digit HS commodity exports represented a very large (55 percent) and growing share (by 10 percent since 1999) of Latin America's overall exports to China in the considered period. These findings further explain China's increasing import concentration levels from Latin America.

TABLE 3 China's Country and Commodity Imports from Latin America, 1999 and 2005 (million of US dollars)

	1999	2005	Differ-ence	Difference as % of Total Export Growth
Brazil: Non-agglom. iron ores & concentrates	236	3,227	2,991	13
Brazil: Yellow soya beans	146	2,380	2,234	9
Argentina: Yellow soya beans	162	2,179	2,017	9
Chile: Copper cathodes & sections	204	2,013	1,809	8
Chile: Copper ores & concentrates	126	1,534	1,408	6
Costa Rica: Other monolithic digital IC	0	719	719	3
Brazil: Agglom. iron ores & concentrates	74	648	574	2
Argentina: Crude soya-bean oil	181	733	552	2
Peru: Flours or meals of fish	187	713	526	2
Peru: Copper ores & concentrates	37	534	497	2
Top 10 Total	**1,352**	**14,680**	**13,328**	56
In percent of total imports	*45*	*55*	*...*	*...*
Other China Imports from LA	1,639	11,993	10,354	...
In percent of total imports	*55*	*45*	*...*	*...*
Total China Imports from LA	**2,991**	**26,673**	**23,682**	*...*

Source: World Trade Atlas.

Empirical Testing

Our empirical findings of the commodity/country source of China's imports from Latin America are supported by firm-level developments. Press reports confirm Brazil's rapidly growing iron ore exports to China, and point to the industry-wide ramifications of surging trade, investment, and intra-firm price negotiations between Latin American and Chinese firms. For example, Brazilian iron ore companies, such as para-state giant Companhia Vale do Rio Doce, and large Chinese steel companies such as BaoSteel (The New York Times 2004), Aluminum Corporation of China (Forbes 2004), and Shougang (Brazil Magazine 2004) have dramatically increased joint operations and trading. Media reports also identify growing export dependence problems faced by Argentinean and Brazilian soy farmers in the face of surging sales to China (AP-Food Technology Online 2006) as well as new joint-ventures being formed by Chile's Codelco (the world's largest copper producer) and China's Mimetals mining company to secure future copper supplies (Bloomberg 2005).

China's Exports to Latin America

Context

China's $23.3 billion in exports to Latin America represented only 3.1 percent of its total exports in 2005 (see table 4). Since 1999, China's average annual rate of export growth to Latin America has been 29 percent. Although its share of China's export market increased, the growth was less than China's export growth to other trade partners, most notably to the EU. Table 4 also highlights the fact that, since 1999, China has diversified its exports markets. Specifically, its exports to the EU and some of its smaller trading partners (Middle East, Latin America, Africa, "other") are constituting a progressively larger share of China's overall exports since 1999, at the expense of China's two top trading groups (Asia and the United States).

TABLE 4 Sources of Growth in China's Export Market, 1999 and 2005

	Level ($US Bil)		Share of China's World Exports **(%)**		Market Share Changes (%)
	1999	2005	1999	2005	1999-2005
Other	0	20	0.0	2.6	2.6
Europe	32	144	16.5	18.9	2.4
Middle East	5	26	2.7	3.5	0.8
Latin America	5	23	2.7	3.1	0.4
Africa	4	19	2.1	2.5	0.3
United States	42	163	21.5	21.4	-0.2
Asia	103	367	52.9	48.1	-4.8
World	195	762	100.0	100.0	0.0

Source: World Trade Atlas.

By-Country Decomposition of China's Export to Latin America, 1999-2005

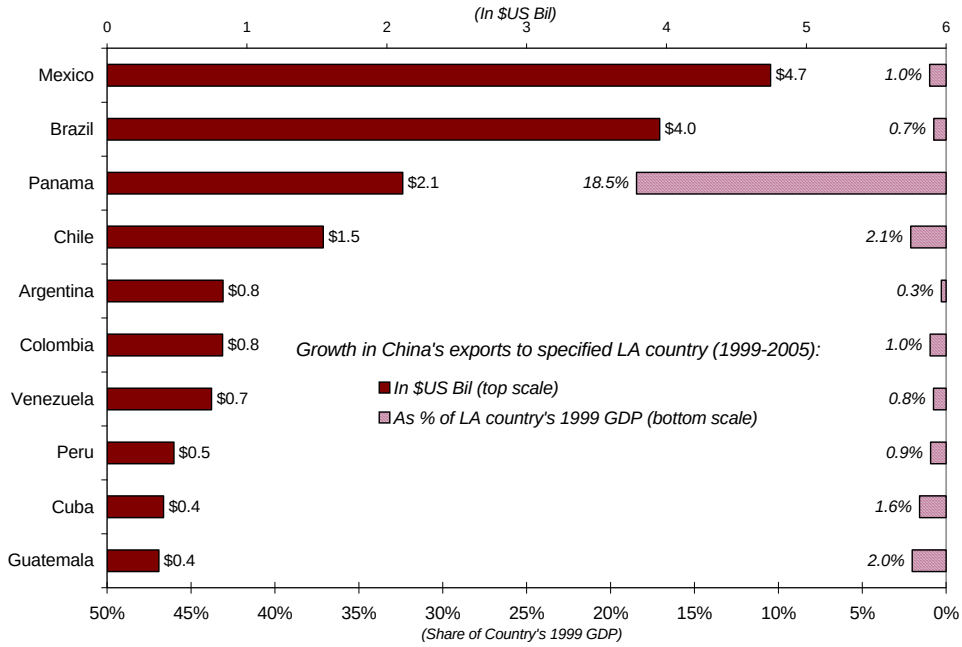
China's exports to Latin America grew from $5 billion in 1999 to $23 billion in 2005. Of these, Mexico, Brazil, Panama, and Chile, and Argentina constituted the 5 largest import markets for Chinese goods. Table 5 highlights the point that while the relative ranking of these countries as recipients of Chinese exports has not changed since 1999, the top 2's (Mexico and Brazil) share has increased, while the share in the remainder of countries in the top 5 (Panama, Chile, Argentina) has decreased. This trend suggests that Latin America's imports from China are becoming more concentrated.

TABLE 5 China's Exports to Latin America, 1999 & 2005

	Level ($US Bil)		Share of China's LA Exports (%)		Market Share Changes (%)
	1999	2005	1999	2005	1999 - 2005
Mexico	0.8	5.5	15.2	23.7	8.5
Brazil	0.9	4.8	16.9	20.7	3.8
Panama	1.0	3.2	20.0	13.5	-6.5
Chile	0.6	2.2	11.6	9.2	-2.4
Argentina	0.5	1.3	9.5	5.7	-3.9
Other	1.4	6.3	26.8	27.2	0.4
Latin America	5	23	100.0	100.0	0.0

Source: World Trade Atlas.

Figure 6 China's export growth to Latin America, 1999 and 2005



Source: IMF's *International Financial Statisitics;* and the World Trade Atlas.

Figure 6 decomposed China's 1999-2005 export increases to Latin America according to major country recipient, while simultaneously expressing those values in terms of 1999 individual country GDP levels. Notable observations include the fact that (1) Mexico and Brazil are, as previously identified, the most important drivers of China's exports growth into Latin America; (2) Panama's import growth from China alone constituted a very high (19 percent) share of Panama's 1999 GDP;[15] and (3) among the Latin American countries that do not re-export a majority of their exports in the Americas and/or Europe (all Latin American countries except Panama), Chinese imports had the biggest impact on the Chilean economy.

[15] This supports anecdotal evidence that Panama is re-exporting many of its imports from China (given its location and transshipment trade practices).

By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

By decomposing China's exports to Latin America by commodity composition in 1999 and 2005, two major themes emerge. First, the high values of textile and footwear related Chinese exports that were prevalent in Latin American markets in 1999 have been gradually replaced by Chinese electrical and non-electrical machinery exports, following China's global export trends. Second, China's exports to Latin America have been more concentrated than China's exports to world market, though this disparity has decreased (possibly suggesting convergence with what China maintains a competitive advantage in producing and selling).

Table 6 shows that, when considering the top 10 2-digit HS categories alone, textiles and footwear related products lost approximately 15 percentage points of their share of China's total exports to Latin America between 1999 (29 percent) and 2005 (13 percent). At the same time, China's electrical and non-electrical machinery exports to Latin America increased 11 percentage points between 1999 (22 percent) and 2005 (34 percent). This is consistent with China's broader trend of exporting more technically sophisticated machinery to world markets.

TABLE 6 China's Commodity Exports to Latin America, 1999 and 2005

1999			2005		
	$US	Share		$US	Share
Total	**5,199**	**100**	**Total**	**23,342**	**100**
Electrical machinery	696	13	Electrical machinery	4,722	20
Woven apparel	583	11	Machinery	3,114	13
Machinery	462	9	Woven apparel	1,336	6
Knit apparel	336	6	Vehicles, not railway	1,085	5
Footwear	277	5	Knit apparel	956	4
Cotton + yarn, fabric	172	3	Mineral fuel, oil etc.	915	4
Toys and sports equip.	169	3	Organic chemicals	868	4
Vehicles, not railway	154	3	Footwear	828	4
Organic chemicals	151	3	Plastic	619	3
Leather art, saddle, bags	128	2	Opt/medical instrument	545	2
Other	2,071	40	*Other*	*8,354*	36
Subtotal: Textile + Footwear	1,496	29	Subtotal: Textile + Footwear	3,120	13
Subtotal: Machinery	1,158	22	Subtotal: Machinery	7,836	34
Top 10 HS2	**3,128**	**60**	**Top 10 HS2**	**14,988**	**64**

Source: World Trade Atlas.

To understand what has been at the root of China's export growth to Latin America, we narrow our attention to the more detailed set of 8-digit commodity data, and assess where the changes in value between 1999 and 2005 have been the greatest. As can be seen in table 7, China's increased electrical and non-electrical machinery exports to Latin America have been essentially driven by a combination of manufacturing (e.g. mobile telephone and computer parts), and consumer goods (e.g. DVDs), which collectively constituted 8 percent of the overall growth in exports in the considered period.
As was done for China's imports from Latin America, a Herfindahl-Hirschman Index was constructed to test whether China's exports to Latin America are becoming more or less concentrated, using the top 50 traded HS-8 digit commodities. As can be seen in Figure 7, China's exports to Latin America are more concentrated than China's world exports in both considered years.

However, China's exports to Latin America have become less concentrated in 2005 relative to 1999,[16] possibly reflecting convergence toward the production and selling of products in which China maintains a competitive advantage. Specifically, China's exports to world markets and Latin America are likely becoming increasingly similar and specialized in electrical and non-electrical machinery.

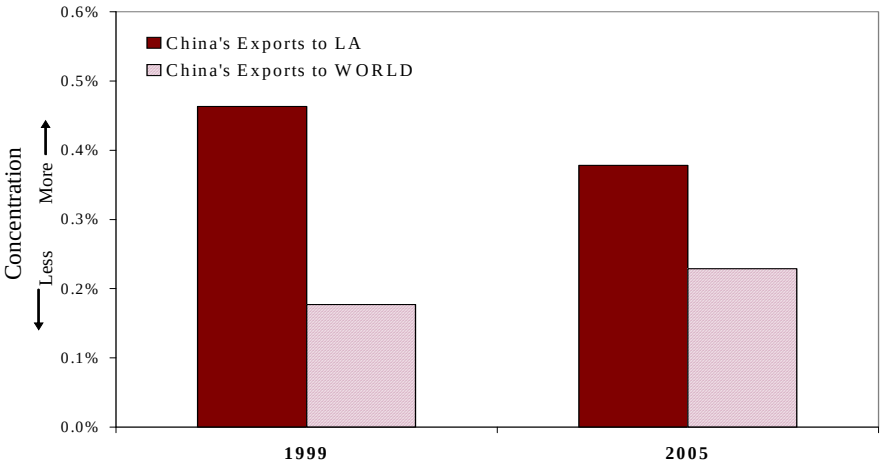
TABLE 7 China's Commodity Exports to Latin America, 1999 and 2005
(millions of US dollars)

	1999	2005	Differ-ence	Difference as % of total export growth
Parts for portable radio telephone	9	616	607	3
Digital Video Disc player	0	507	507	3
Parts/accessories for computers	72	435	363	2
Fuel oils (No. 5~7)	0	348	348	2
Female' cotton trousers and	54	358	304	2
Radio telephone handsets	0	277	277	2
Coke & semi-coke	41	311	270	1
Dyed woven fabrics of synth filament	4	265	261	1
Color film	0	220	220	1
Motorcycles, rec. inter piston engines	0	213	213	1
Top 10 Total	**180**	**3,550**	**3,770**	*19*
In percent of total China exports to	*3*	*15*	*...*	*...*
Other China Exports to LA	5,019	19,792	14,772	...
In percent of total China exports to	*97*	*85*	*...*	*...*
Total China Exports to LA	**5,199**	**23,342**	**18,142**	...

Source: World Trade Atlas.

[16] These conclusions are broadly consistent with similar HHI calculations done at more disaggregated levels of classification.

Figure 7 Concentration of China's exports, 1999 and 2005



Source:World Trade Atlas; Calculations based on computed Herfindahl-Hirschman Index, Top 50 8-Digit commodities.

By-Country/By-Commodity Decomposition of China's Import Growth from Latin America, 1999-2005

The preceding sections identified Mexico and Brazil, and electrical and non-electrical machinery to be the principle sources of China's robust export growth to Latin America since 1999. This did not necessarily suggest, however, that the two were related. The results of a by-country, by-commodity decomposition of China's export growth are presented in table 8. As can be seen, the largest sources of growth were China's exports of cell phone parts to Brazil and Mexico, which collectively accounted for 3 percent of China's overall export growth to Latin America over the considered period. Other important driving factors have been computer parts to Mexico and Brazil (2 percent of total Chinese export growth to Latin America from 1999 to 2005). The textile and footwear products exported by China to Panama, which collectively accounted for a little over 2 percent of China's overall exports to Latin America, are more difficult to analyze given their likely subsequent re-exportation to different destinations in the Americas.

One of our major findings is that China's exports of cell phone, computer parts, and DVD players, to Mexico and Brazil are among the largest sources of China's export growth to Latin America. To underscore this finding, we note that the share of China's total cell phone parts, computer components, and DVD player exports going to Mexico and Brazil (relative to China's worldwide exports of those products) is greater than China's share of Brazilian and Mexican exports (relative to China's world exports) for both considered years.

TABLE 8 China's Country & Commodity Exports From Latin America, 1999 and 2005 (million of dollars)

	1999	2005	Differ-ence	Difference as % of total export growth
Brazil: Parts for portable radio telephone sets	9	380	371	2
Mexico: Parts/accessories for computers	0	248	248	1
Brazil: Coke & semi-coke	25	268	243	1
Mexico: Parts for portable radio telephone sets	0	236	236	1
Panama: Female cotton trousers and breeches	0	214	214	1
Panama: Rubber/plastic footwear (not cover ankle)	0	140	140	1
Brazil: Parts/accessories for computers	0	118	118	1
Brazil: Dyed woven fabrics of synthetic filament yarn	0	100	100	1
Panama: Cotton T-shirts, knitted/crocheted	0	88	88	0
Mexico: Female cotton trousers/ breeches	0	83	83	0
Top 10 total	**34**	**1,876**	**1,842**	10
In percent of total LA imports	*1*	*8*	*...*	*...*
Other China Imports from LA	5,166	21,466	16,301	...
In percent of total LA imports	*99*	*92*	*...*	*...*
Total China exports to LA	**5,199**	**23,342**	**18,142**	...

Source: World Trade Atlas.

Empirical Testing

The identified empirical findings related to the commodity/country source of China's exports to Latin America are supported by firm-level developments. For example, data showing China's large and rapidly growing volume of cell phone component exports to Mexico and Brazil has been supported by press reports claiming that Chinese cell phone manufactures, such as Huawei and ZTE, have been selling low-cost equipment to many of Brazil's and Mexico's telecommunication firms for local production. These exports include both low and high-technology (e.g. digital loop carriers,[17] mobile telecommunication systems,[18] and personal handphone systems[19]) component sales to such companies as Brazil's Tele Norte Leste Participacoes SA (TNE) and Mexico's

[17] Digital loop technology allows users to simultaneously use voice, data, and video options on mobile devices.

[18] Used to incorporate broadband services to mobile phones.

[19] A technology that offers network access in densely populated cities.

Telmex (Cowley 2005).[20] Moreover, China's ZTE has reportedly made plans to establish local Mexican manufacturing plants for re-exportation into U.S. and Canadian markets, where Mexico has a free trade agreement (El Financiero 2004).

The described surges in China's computer component exports to Latin America have also gained widespread attention. Some press reports have confirmed China's recent export surges of these products to Brazil, such as through Lenovo's new alliance with Brazil's Solectreon to manufacture Thinkpads for the South American market (Volor Economico 2006). Most attention, however, has been focused on China's computer component exports to Guadalajara —Mexico's largest computer production cluster. This region produces nearly two-thirds of Mexico's computers, employs tens of thousands of local workers, and has greatly benefitted from FDI flows from the U.S., particularly those following NAFTA's establishment (Dedrick and Kraemer 1998, 2001). Most importantly, Guadalajara has been increasingly used as a final assembly and re-export platform from which computers are distributed throughout North America. While the very big multinationals have been relying on this re-export platform for several years, companies such as Lenovo (which recently bought IBM's line of personal computers) and LG have become increasingly aware of the advantages of manufacturing in Mexico. Despite higher wages in Mexico relative to China, Guadalajara's relative proximity to the U.S., Canadian, and Mexican end-markets, has been an important reason why Chinese and other multinational companies have increased their manufacturing in this region. Shortening supply chains is often considered important in a high-technology computer industry, where time-sensitivity, rapid depreciation costs, and built-to-order trends increasingly drive sales (Dedrick and Kraemer 2001).

Anecdotal evidence also supports the observation that China's DVD player exports to Mexico and Brazil are surging. For example, China's TLC, which is one of the world's biggest manufacturers of electronic goods, recently established a very large and growing alliance with local distributors in Brazil, to both service the domestic market and re-export DVDs to the rest of South America. China's surge in DVD player exports to Latin America is not as striking as its surging exports of intermediary parts for cell phone and computer production, since China already produces a disproportionately large share of the world's DVD players (90 percent by 2004), and since Mexico and Brazil possess one of the wealthiest consumer bases in Latin America (Gazeta Mercantil 2005 and SinoCast China IT Watch 2006).

[20] Chinese firms' operational expertise in servicing complex telecommunication infrastructure market is well suited for the Latin American market.

Implications of Economic Integration

This section highlights the implications of sustained economic integration between China and Latin America. It suggests that while there are many benefits of deeper economic integration to both sides, the vulnerabilities maybe predominantly borne by the Latin American economies.

Bilateral Gains in China-LA Trade

The gains from deeper economic integration between China and Latin America are predominantly based on complementary resource endowments, as well as on economic growth and rising income levels on both sides of the Pacific. China's imports from Latin America can be seen as necessary in meeting its demand for goods produced from relatively abundant land and natural resources, while Latin America's imports can be viewed as meeting its demand for labor-intensive consumer and manufacturing products. China's economic growth seems likely to continue unabated through the medium-term, and it will continue to depend on minerals and food to sustain its industrialization and rising standards of living (in a similar way to what was shown in Figure 3).

Beneficiaries of Deeper Economic Integration

China's Exporters: By increasing manufacturing component exports, Chinese exporters diversify their sales away from final goods, while gaining access to Latin American markets that might otherwise be difficult to penetrate. China's increasing dominance in Latin American consumer products markets (e.g. electronics and clothing) also enable Chinese firms to extend their existing export markets to that region.

China's Importers: Chinese importers have recently diversified their sources of raw material imports, increasing their presence on world commodity markets. Large state-owned Chinese firms are consolidating vertically integrated supply chains to acquire critical raw materials such as iron and copper in exchange for long-term contracts and investments in Latin American mines, roads, ports, and other production and transport facilities. Moreover, many of these contracts have been signed with Latin American parastatal firms.

Latin American Exporters: Chinese demand for raw materials has helped resource rich Latin American exporters dramatically expand their sales. Given China's dominant position in global commodity markets, its increased demand affects both the volume and price of its needed commodities, which in turn greatly benefits countries such as Argentina, Brazil, and Chile. Specifically, the boom in Latin American exports has stimulated economic growth and employment in resource-rich countries, and enabled Latin American countries to diversify their export markets by adding China to their traditional United

States and European trading partners. Moreover, Latin American exporters in Mexico and Brazil are also benefiting from using cheaper Chinese inputs as components to their exports of electrical machinery products (e.g. mobile phones and computers).

Latin American Importers: Latin American importers and retailers of Chinese made consumer goods have also increased their sales, and Latin consumer welfare has likely benefitted from improved access to a broad range of inexpensive consumer goods. Booming imports of Chinese parts for final assembly present Latin American economies with new opportunities for specialization in production as part of multinationals' global supply chains for technologically sophisticated products. Although some countries, such as Mexico, are reported to have lost manufacturing plants and jobs to Chinese firms, some Latin American firms are benefiting from their ability to take advantage of this new supply chain and China's increasing dominance in sales to worldwide consumer markets.

Asymmetric Vulnerabilities in China-LA Trade

Economic integration between China and Latin America will likely deepen in the near to medium-term, given many of the associated benefits discussed above. Although both sides continue to be exposed to risks, our data suggests that the likelihood and potential impact of those risks are asymmetric. Specifically, China maybe less susceptible to problems associated with bilateral trade flows given its disproportionately smaller trade dependence on Latin America. The risk exposures are as follows—

China's Exporters: Possible threats faced by China's exporters could include a widespread recession in Latin America or protectionism that created effective barriers to Chinese sales. Both should reduce demand for Chinese consumer goods and manufacturing components. Since the volume of this trade relative to China's overall exports is small, any such drop in demand would likely have a minimal impact on China's overall economy.

China's Importers: China's importers could be vulnerable to supply-chain interruptions and spikes in commodity prices. However, it is not clear how much higher prices would slow China's economic growth, which has weathered recent surges in commodity prices without any significant slowdown. In particular, construction, which has driven much of China's demand for iron and copper, has continued to grow relatively unabated despite rising iron and copper prices. Moreover, China maintains diversified sources for its primary products (though less so than the past). Finally, China's well financed importers—many of which are large state enterprises whose high volume purchases give them considerable negotiating power in international

commodity markets—maintain fallback options to purchase commodities from world markets if Latin American supplies were disrupted.

Latin American Exporters: Latin American exporters, in contrast, are aware of the history of boom and bust in their primary product export markets. The Chinese government's ability to stockpile, coordinate cross-company import strategies, and attempt to drive down prices could exacerbate Latin American exporter vulnerabilities. Chinese investment in ports and other transportation facilities might also be cut back, since much current and planned investment is aimed at improving efficiency in ports, transportation, and other facilities for extraction of primary commodities. With China's imports heavily concentrated in a few primary products, any slackening in the pace of industrialization and construction could sharply reduce both the volume and price of Latin American exports.

Latin American Importers: Latin American importers appear potentially vulnerable to supply-chain problems. Multinational corporations might decide to relocate final assembly of cell phones to new locations to gain better lower labor costs, for example, or Chinese companies might stop supplying parts for assembly. Although these appear unlikely, given China's export diversification strategies and desire to enhance exports to the Western Hemisphere, it could impact manufacturing in the telecommunication sector of Latin America.

Conclusion

We have identified three major China-Latin America trade patterns emerging since the escalation of bilateral trade activities in 1999, and addressed potentially important implications of these developments on these trading partners' future economic relationship. Specifically, we show that (1) China's iron, copper, and soybean imports from Latin America have become increasing concentrated; (2) China and Latin America have become more interconnected on telecommunications and computer manufacturing supply chains; and (3) that Chinese-made cheap electronic and textile products have increasingly penetrated the Latin American consumer market. We also address potential implications of deeper economic integration between the two trading partners. Latin America's disproportionate export dependence on China suggests that the risks associated with deeper integration may be predominantly borne by China's Latin American trading partners.

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Access to Capital in China: Competitive Conditions for Foreign and Domestic Firms

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Abstract

The Chinese financial sector is illustrative of the hierarchy of privilege that has dominated the country's transition from a centrally planned economy to a more market-based system. Despite their declining contribution to GDP, large state-owned enterprises (SOEs) sit at the pinnacle of privilege and financial access. They obtain a disproportionate share of funding from all sources: bank loans, stock markets, venture capital, and bond markets. Private firms, domestic and foreign, which in the last five years have played a critical role in China's growth, face substantial capital access barriers. Greater access to capital markets for these firms, and the full implementation of international standards of lending and market regulation, would fuel China's fastest growing firms and enterprises and precipitate greater domestic competition.

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Introduction

The Chinese financial sector is illustrative of the hierarchy of privilege that has dominated the country's transition from a centrally planned economy to a more market-based system. Despite their declining contribution to GDP, large state-owned enterprises (SOEs) sit at the pinnacle of financial access. They obtain a disproportionate share of financing from all sources: bank loans, stock markets, venture capital, and bond markets. Because large, inefficient SOEs get most of the canalized capital, and because they are still required to provide many of the social services for their employees and families, there is a substantial bad-debt problem in the system that is unhealthy to let continue but dangerous to unravel. Private firms, domestic and foreign, which in the last five years have played a critical role in China's growth, face substantial capital access barriers and must use a wide variety of informal means to obtain access to capital and pay more for it. Greater access to capital for these firms, and the full implementation of international standards of lending and market regulation, would fuel China's fastest growing enterprises and precipitate greater domestic competition.

The December 2006 deadline of China's phase in period for its WTO commitments in the financial sector will bring increased foreign participation in Chinese banks and foreign competition that will limit the government's ability to continue lending to loss-making SOEs. China reportedly channels most financing to its large SOEs because of the perception that they are too important – from the standpoint of employment and social stability – to fail. However, redirecting more bank, equity, venture capital and debt financing from SOEs to private enterprises could increase the efficiency of investment and significantly improve returns for the large number of households who hold their savings in bank deposits and at present have few good options. This article begins with a description of the banking, equity, venture capital and debt sectors of China's financial system, considering both historical information and recent trends. It then addresses the competitive conditions facing foreign firms, focusing on regulatory barriers as well as practical impediments to participation in these sectors.

The Banking Sector

Overall Structure

The banking system is the dominant player in China's financial sector. Most credit is extended through bank loans, which represented 78 percent of funds raised by households, enterprises and government sectors in 2005, followed by government bonds, corporate bonds and the stock market (table 1).

TABLE 1 Funds raised in China's domestic economy, 2001-2005 (as percent of total)

Items	2001	2002	2003	2004	2005
Bank loans	75.9	80.2	85.2	82.9	78.1
Government bonds	15.7	14.4	10.0	10.8	9.5
Corporate bonds	.9	1.4	1.0	1.1	6.4
Stocks	7.6	4.0	3.9	5.2	6.0

Source: People's Bank of China, 2002-2006.

Historically, banks have been the Government's primary tool for achieving industrial goals. In the 1960s and 1970s, bank lending complemented the Government's production plans, with banks acting as "cashiers" for the economic program (Huang, Saich and Steinfeld 2005, 2). Bank managers, appointed by government officials, provided financing to SOEs based on national development plans. Until 1979, the People's Bank of China (PBOC) was the only bank in the country, acting both as the central bank and the source and location for most bank loans and deposits (Lardy 1998, 61).

The banking system gradually evolved in the 1980s, with the establishment of the "Big Four" state-owned commercial banks (SOCBs) and other large state-owned banks, to take over the lending functions of the PBOC. Policy lending – that is, lending directed by central or local governmental authorities rather than based on commercial principles – predominated in the Big Four in the 1980s and early 1990s. The SOCBs financed large SOEs that had little interest or ability to make repayments, particularly since they also were required to provide costly public services (Green 2004, 5).

To address losses from policy lending, the Government attempted to remove this function from the SOCBs, establishing three policy lending banks in 1994. Joint stock commercial banks, city banks, and rural and urban credit

cooperatives, all directly or indirectly government-owned, also were set up to diversify the financial system and to finance development projects.

The four SOCBs, however, remain the dominant players and the principal lenders to the SOEs. SOEs are the favored customers of the SOCBs and policy lending banks, which control a disproportionately large share of the banking assets. The equity of the joint stock banks is partly owned by the state and partly by other interests, such as SOEs and private enterprises. Although China has two nominally private banks, both are dominated by state shareholders and management (EIU 2006d, 21-2). The policy banks are expected to fund infrastructure and development projects and lend predominantly to the SOEs. Foreign banks play a very small role in the market (table 2).

Policy lending, and the high degree of state ownership of China's banking institutions, result in a banking system focused on the financing needs of large SOEs, to the detriment of domestic and foreign private firms and individuals. Small and medium-sizes enterprises (SMEs), which produce more than half of gross domestic product, obtain only about 10 percent of bank loans. Over 90 percent of private firms surveyed in a joint OECD-China National Bureau of Statistics study stated that they had difficulty accessing bank credit (OECD 2005, 142). Because of limited access to bank loans, SMEs must depend on personal financing, retained earnings and informal markets to raise capital (box 1).

TABLE 2 China's major banking institutions, number of institutions, share of total assets and share of total loans, December 31, 2005

	Number of institutions	Share of total assets	Share of total loans
Big Four Banks	4	53.5	50.5
Joint Stock Commercial Banks	13	15.3	15.4
City Commercial Banks	115	5.4	5.2
Urban Credit Cooperatives	681	.5	.5
Rural Credit Cooperatives	32,876	8.3	8.9
Policy banks and other institutions (finance, trust and investment and leasing companies)	149	15.4	15.4
Foreign Banks (parents, subsidiaries and branches)	278	1.6	1.6

Source: ICBC 2006, 41.

Box 1 China's Shadow Financial Markets

A study by China's Central University of Finance & Economics estimated that an amount equal to approximately 30 percent of all official loans was borrowed in informal markets in 2003.

- Informal markets are particularly critical in rural areas. In some of the least developed western provinces of China, 60-70 percent of financing for SMEs comes from informal markets, while in coastal areas the share may reach 30 percent.

- Interest rates are much higher on the informal markets. While the interest rate set by the Central Bank on short and medium term loans is low (less than 6 percent), interest rates in informal markets in Jiangsu and Zhejiang range from 12 to 30 percent; in the northeast and northwest, annual rates of 100 to 200 percent are not unusual.

- Informal lending can take many forms, including individual lenders, enterprise networks, pawnshops and underground financial organizations. Some firms tap the funds of large SOEs by selling a portion of their company to the SOE in exchange for a credit guarantee that enables the firm to borrow from banks. However, finding an SOE willing to provide a credit guarantee can be difficult and expensive.

- For those firms without access to credit guarantors, murkier arrangements may come into play. Related party transactions – for example, where the firm sets up and capitalizes a subsidiary and then uses the subsidiary as a loan guarantor without disclosing the relationship – create off-the-books risk for lenders.

- Receivables financing – where firms borrow against the strength of their accounts receivable – can be convoluted. One variant is for a firm to arrange a fake transaction with a related party and then use the fake invoice as collateral to borrow from an SOE. The SOE may obtain a pledge of assets as fixed security and enjoy the advantage of a better return than it can obtain from its bank deposits – assuming the loan is repaid. If not, there is little recourse.

Source: Xiaojie and Jian 2005.

This large amount of informal lending adds substantial off-the-books risk to an already unstable financial sector. However, complete suppression of the in formal markets would cut off a critical funding source for firms. Removing barriers to access to capital in the formal system is essential to reducing demand in the shadow markets. The ability of a financial system to provide funds to the private sector, rather than just making loans for political reasons, is strongly associated with economic growth (Lardy 1998, 130).

The large number of nonperforming loans (NPLs) that policy lending produces has been a drag on China's domestic economy. The total amount of NPLs is

substantial; official estimates of $164 billion are dwarfed by private estimates that go as high as $800 billion (although Ernst & Young recently withdrew its own estimate of $911 billion) (Schmitt and Feiger 2006). According to the PBOC, the NPL ratio for the Big Four banks was 9.8 percent in March 2006, but the official press regularly notes that 30 to 40 percent of loans are not recoverable and some estimates go as high as 60 percent (EIU 2006d, 19). Much of the difference in estimates is attributable to the treatment of new loans made during a lending spree from 2002 to 2004 (EIU 2006c; Bottelier 2005). Figuring out whether these new loans are markedly better than the old is critical, particularly since there was another large surge in lending in the first half of 2006. The government has expressed concerns; in 2005, the PBOC estimated that companies with outstanding debts of nearly $23 billion, almost all owed to the Big Four banks, would go bankrupt by 2008 – these future debts are likely to be a continued drag on the banking sector (EIU 2006e).

Increased reliance on commercial lending standards, rather than policy lending, would go a long way toward improving overall loan quality and access to capital for private firms. Unfortunately, a recent IMF working paper found little evidence that SOCBs have become more commercially-oriented. The pricing of credit risk remains undifferentiated; lending appears to be driven primarily by the availability of deposits; and banks do not appear to take a firm's profitability into account when making loans (Podpiera 2006, 18). The Chinese Banking and Regulatory Commission (CBRC) similarly has reported that it is "common practice" for banks to ignore regulations and fail to monitor loans and that bad loans levels are "not accurately revealed" (EIU 2005b). These practices would be difficult to maintain in a more open banking sector.

Conditions of Competition for Foreign Firms

Competitive Conditions for Foreign Banks

China's preparations for entry, and entry into the WTO in 2001, have been crucial drivers of the incremental reform and development of the financial sector. China is expected to comply at the end of 2006 with its WTO commitment to lift all geographic limitations and restrictions on the type of business foreign banks may conduct; at that time, foreign banks should be able to enter the market and service Chinese companies and individuals on a national treatment basis (Garcia-Herrero and Santabarbara 2004, 22).

As required by its WTO commitments, China has been relaxing restrictions on foreign banks, albeit gradually. In 2001, China opened up banking services in foreign currency to all banks. Since 2003, foreign banks have been authorized

to conduct some operations in the wholesale domestic currency market, but with geographic limits; foreign banks may offer loans and accept deposits in foreign currency, and provide yuan-denominated services to businesses, in 25 cities (Carew 2006). In September of 2004, China lifted a rule limiting foreign banks to opening a single branch per year, a significant barrier to competition. China has announced that new rules governing foreign banks will take effect on December 11, 2006, the anniversary of its WTO entry. Draft rules indicate that China may require that foreign banks incorporate each local operation as a Chinese company with a substantial amount of registered capital, and may impose a high minimum for the deposits that foreign banks may accept from individuals. A high threshold for individual deposits will keep the majority of personal savings out of the reach of foreign banks (Morgan 2006).

As China has lifted banking restrictions only gradually, foreign banks have not substantially increased their participation in the banking sector. Foreign banks' share of the market has remained basically unchanged since the 2001 accession; they continue to source less than one percent of RMB-denominated loans. Only participation in foreign exchange loans has shown marked improvement (table 3).

TABLE 3 Foreign banks' participation in market share, RMB loans and foreign exchange loans, 2001 and 2005 (percent)

Measure	2001	2005
Market share	1.80	1.90
RMB loans	0.35	0.55
Foreign exchange loans	15.00	21.00

Source: PBOC 2006b, 4.

The limited participation of foreign banks in the financial sector also is attributable to China's erection of additional regulatory barriers to competition. Thus, in 2002, China imposed working capital requirements that are substantially higher than international standards; more than 15 times higher than those required in the European Union, for example. The requirement that banks wishing to carry out RMB business must have operated in China for three years with two fiscal years of profitability also is a significant barrier to entry (EIU 2004, 70). Similarly, China's 20 percent limit on the equity that a single foreign investor may hold in a bank and 25 percent limit on the equity of all foreign investors – restrictions that are asserted to be inconsistent with China's WTO commitments – have impeded participation in the banking sector (USTR

2005, 77). Foreign bank representatives overwhelmingly identify the complex regulatory environment as the most difficult aspect of the Chinese banking industry (Pricewaterhouse Coopers 2005, 19).

The government has been receptive to *minority* participation by foreign investors in Chinese banks. This "corporatization" (as opposed to privatization) of the SOCBs moves the government from sole owner to a shared, but still majority, ownership position. Currently, Newbridge Capital, a U.S. non-bank investor that holds 17.9 percent of Shenzehn Development Bank, is the only foreign investor with a controlling interest in a domestically-registered bank (Federal Reserve Bank of San Francisco 2005). By the end of 2005, foreign financial institutions had taken stakes in 20 different Chinese banks (McLaughlin 2006). Many of these minority investments come with competitive restrictions. Thus, as part of its China Construction Bank (CCB) investment, Bank of America agreed to close existing retail operations, not open new ones and to lock up its CCB shares for three years (Carew 2006).

The greatest foreign investment focus has been on the Big Four SOCBs, which together account for more than 50 percent of the assets of the banking system. IPOs for three of the Big Four SOCBs have been completed. Prior to the IPOs, the balance sheets of the SOCBs were cleaned up by transferring the bulk of the NPLs to asset management companies which issues bonds for the loans' full face value, despite the limited ability to collect on the bad loans. The October 2006 IPO for China's largest bank, the Industrial and Commercial Bank (ICB), which raised more than $22 billion (the world's biggest IPO ever), was preceded by the transfer of about $85 billion in bad loans to an asset management company, a $15 billion infusion from an investment arm of the government, and the $3.8 billion sale of a 5.8 percent stake to a foreign group. And these were not the first cash infusions; a large number of NPLs were removed from the books in 1999, when ICB's NPL ratio stood at 47.5 percent of all loans. ICB reported an NPL rate of 4.1 percent just prior to the IPO (EIU 2006e).

These equity stakes permit foreign institutions a greater exposure to retail banking and access to branch networks that can facilitate the cross-selling of credits cards, insurance and mutual funds to individual consumers in the large domestic market (OECD 2005, 151-52). However, foreign investors' ability to improve corporate governance is limited by their minority stakes and competitive restrictions. China's guiding principles entitled "long stake holding, governance improving, business cooperation and avoiding peer competition" make clear its intent that foreign investors become strategic partners rather than competitors as the banking sector is opened (PBOC 2006a, 4). The success of this strategy for foreign investors remains to be seen.

Competitive Conditions for Foreign Invested Enterprises (FIEs)

FIEs have limited access to capital in China. Most FIEs depend on parent company financing and the reinvestment of profits earned locally. It is very difficult, however, for smaller FIEs to obtain funds without ties to local bank managers or loan officers. Foreign banks, the most reliable source of local funding, can raise only limited amounts of capital (EIU 2006d, 5,124).

The restrictive foreign exchange control system further complicates FIEs access to capital. The State Administration of Foreign Exchange (SAFE) is responsible for administering the complex regulations China employs to maintain currency transactions that are generally open on the current account but closed on the capital account (box 2).

Surveys of FIEs confirm the difficulties posed by the foreign exchange control system and limited access to local capital. FIEs identify financial and tax issues, and particularly the regulation of capital and earnings, as one of the greatest challenge of investing in China. They also cite difficulties in obtaining loans and banking services that are inadequate to meet demand (Pricewaterhouse Coopers 2004, 6-7). The latter complaints are similar to those articulated by domestic firms as well (Tam 2005, 66). Off-shore sources of finance often are critical to FIEs; foreign exchange controls and a complicated regulatory environment substantially undercut their access to capital.

The Stock Market

Overall Structure

Like the banking sector, the stock market in China was mainly established as a funding source for the large SOEs. The Shanghai and Shenzhen stock exchanges, which listed their first shares in December of 1990, were controlled initially by their local governments. The local governments enjoyed substantial *de facto* powers to develop and regulate the markets and local government leaders selected the SOEs that would restructure and list on them. Companies under local government control that were socially or economically important, or in dire need of capital, received preference, to the detriment of those without powerful connections (Green 2003, 40, 65). With little or no interest paid on bank savings accounts, China's savers initially were motivated to invest in the stock markets by artificially high listing profits and the misconception that investments would be protected because the markets were set up by the government. More recently, poor investment opportunities and returns, non-transparent and unreliable company records, and a wave of corruption scandals

have contributed to declines in the stock market, even while China has enjoyed record GDP growth (Livett 2005, 13).

Box 2 FIE Foreign Exchange Transactions in China

- FIEs must first obtain permission from SAFE to open and maintain foreign exchange accounts for current and capital account transactions.
- There are three types of accounts that a foreign investor is permitted to open prior to establishing an FIE: expense accounts; acquisition accounts; and guarantee accounts that can be used for initial expenses. These accounts may be transferred to the FIE's capital account once the FIE is established.
- Once established, and after obtaining the necessary registrations and licenses, the FIE must set up separate accounts for current and capital account transactions. To maintain control over foreign exchange in the current account, authorities fix a ceiling on the account when it is opened. Funds that exceed the ceiling must be converted to RMB. For capital account transactions, FIEs must obtain SAFE permission. Different rules apply based on whether the transaction involves inward remittance, settlement, sale or payment of foreign exchange.
- FIEs are limited in the total amount of foreign debt they may carry to the difference between the total investment and the registered capital. For short-term foreign exchange debts (under a year), only the outstanding amount of debt applies towards the total permitted. Medium and long-term debts permanently eat into the permitted amount, regardless of repayment. Beginning in April of 2005, this limit also applies to RMB-denominated loans.
- Chinese law also requires FIEs to hire Chinese registered accountants to prepare an "investment verification report" to ensure that capital contributions and other transactions are carried out in compliance with the requirements of the foreign exchange authorities.

Source: American Chamber of Commerce People's Republic of China 2003.

Beginning in the 1990s, the China Securities and Regulatory Commission (CSRC), under the direction of the State Council, incrementally obtained authority over the stock exchanges from local entities, with the goal of bringing them up to international standards (Green 2003, 137-56). However, the CSRC struggles with two conflicting mandates: promotion and regulation of the market (Wang 2004, 54). As a government agency, it is required to implement the Government's industrial policy, that is, supporting the SOEs and ensuring they have access to capital through the stock markets. Thus, for example, in 1997, the CSRC required as a necessary condition for a public listing and priority access to IPOs that an SOE have merged with or taken over a loss-making SOE. This requirement was intended to advance the governmental goal of *tou-kun* – "shaking off the difficulties" of the failing enterprises (Zhang 2005, 34, 36). By contrast, listing procedures adopted in the last few years are more market-oriented and consistent with the CSRC's regulatory agenda.

The stock markets also have been hindered by governmental decisions to restructure the SOEs for public listing in a manner that still preserves state control. Shares typically have been divided into three types: state shares; institutional shares (also known as legal person or LP shares); and individual shares. State shares are held by central and local government agencies and LP shares are held by profit-seeking SOEs or other state-controlled institutions. LP and state shares, which together represent about two thirds of all shares, cannot be traded publicly; they can only be transferred, upon approval of the stock exchange (LP shares) or the Ministry of Finance (state shares). The final third of the shares, individual shares, are the only type that can be traded on the exchanges. Individual shares may be one of three types: A-shares, initially available only to Chinese retail and institutional investors; B-shares, available only to foreigners until 2001, when they were opened to Chinese retail investors; and H-shares, issued abroad by Chinese corporations for foreign investors, usually in Hong Kong but also New York and London. This restructuring method has created firms that are "one-third privatized" and that suffer from flawed corporate governance structures and the inadequate performance incentives that arise from ongoing governmental control (Green 2004, 2, 3).

Consistent with the focus on financing the SOEs, the stock exchanges have provided few listing opportunities for private firms. In 2001, 81.6 percent of listed firms were controlled, directly or indirectly, by the state. Only 18.4 percent were controlled by the non-state sector, specifically, domestic private firms, collectives and foreign private firms. Listings for foreign private firms were particularly small, less than one percent of the total (Liu and Pei 2005, 120-21).

In addition to their dominance of domestic stock markets, large SOEs also have been favored with preferred access to overseas markets. In 2005, mostly large SOEs raised $24.7 billion from H-share issuance overseas (Pricewaterhouse Coopers 2006, 3). Domestically, they raised an additional $19.2 billion from the issuance of non-tradeable state and LP shares, compared to only $4.2 billion from the issuance of tradeable shares (Chinese News Digest 2006).

The CSRC has taken steps to address distortions in the stock markets including a pilot program in 2005 to begin conversion of the state's non-tradeable holdings to tradeable shares; measures to end divisions between A-shares and B-shares; the establishment of a Board for SMEs in the Shenzhen stock exchange; and measures to implement a more objective system for new listings (EIU 2006a, 51). The CSRC suspended all new IPOs on China's stock markets in April of 2005, while the program to sell-off state shares was being implemented. By January 2006, 458 listed companies had completed or were in process of selling off some of their state shares and in June 2006, the CSRC permitted the resumption of domestic IPOs (EIU 2006d, 102-3). Whether reforms to unify the A- and B-share markets and convert non-tradeable shares to tradeable will continue, while China still maintains the controls on the capital account that are intended to insulate the country from global financial market swings, remains to be seen.

Competitive Conditions for Foreign Firms and Foreign Investors

FIEs in China are largely unable to access stock markets to sell equity. The stock markets are focused on facilitating the restructuring and injection of capital into the SOEs, not on the financing needs of domestic or foreign private firms. These barriers to capital access are substantial and are not addressed in China's WTO commitments (USTR 2006, 153). Although China announced that foreign firms would be permitted to list on domestic exchanges, in the wake of its entry into the WTO, the reality has been to the contrary. Permitting international companies with substantial China operations to offer A-shares on China's stock markets would provide the companies with a domestic avenue to raise capital, and improve the quality and diversity of China's stock markets (EIU 2006d, 111).

More positively, China has expanded opportunities for established foreign investors to participate in its stock market. In 2002, the CSRC began a qualified foreign institutional investor (QFII) program to provide more investment opportunities for foreign asset management companies and capital injections for listed companies. The QFII allows qualified foreign investors to invest in A-shares of stocks, bonds, and funds approved by the CSRC. At the end of 2005, there were 26 QFIIs with an approved investment quota of $4.05 billion, with the quota set to be raised to $10 billion in 2006 (EIU 2005a). Recently, China

announced additional rule changes to further facilitate foreign investment in Chinese-listed companies. Since the end of January, 2006, foreign investors have been able to buy A-shares directly on China's stock markets, rather than through asset management companies. The foreign investors have to meet strict government standards, which include: overseas assets of at least $100 million, and requirements that they buy at least 10 percent of the target company and hold their stake for a minimum of three years (Lineabugh 2006, A6). This program is intended to provide momentum for the ongoing process of conversion of non-tradeable shares to tradeable shares, a conversion that may increase opportunities for foreign investors.

Venture Capital Activities

Overall Structure

The venture capital industry also has been dominated by the government. Venture capital made its first appearance in China in 1985, with a government decision to develop high technology industries and the formation of the first venture capital firm, the government-sponsored China Venturetech Investment Corporation. Although initial government-backed investment operations generally failed, there has been resurgence in venture capital activity since China's admission to the WTO (Kenny, Han and Tanaka 2002, 106-109). Venture capital investment has grown rapidly from $418 million in 2002 to more than $1 billion in 2005, invested in 233 China mainland or mainland-related enterprises (Zero2ipo 2005). Most domestic venture capital firms are managed by government officials – for example, Shenzhen Capital Group, one of the largest domestic venture capital firms, is wholly owned by the Shenzhen municipal government – and nearly half of the capital of the firms comes from government entities (OECD 2005, 158; EIU 2006d, 49).

Under current rules, applicable to both domestic venture capital firms and foreign-invested venture capital enterprises in China (FICVEs), firms are subject to the highest statutory tax rate of 33 percent on capital gains and have very limited exit routes through domestic or overseas stock markets. In 2005, Chinese authorities issued new guidelines, scheduled to go into effect in 2006, intended to foster *domestic* venture capital firms. The new guidelines recommend that local governments provide financing assistance, favorable tax treatment, and direct investment in Chinese venture capital firms. They also provide less stringent capitalization, investment amount, investor qualification and regulatory requirements than those applicable to FICVEs (Guerrera, Yee and Yeh 2005, 30).

FICVEs are governed by 2003 regulations that include high investment and qualification thresholds, government approval requirements, and strict foreign exchange limitations on the ability to remit profits and dividends back to the investor (Hoo, *et al* 2005a). Substantial legal and de facto restraints on the ability of both FICVEs and domestic firms to access the stock markets in China and overseas for IPO listings make exit strategies extremely difficult (box 3). For these reasons, foreign venture capital firms investing in China usually do not use FICVEs but instead rely on offshore holding companies created to receive their investments.

Box 3 The Challenges of Venture Capital Activity in China

- Lack of a NASDAQ-like exchange for exits for venture capital investments
- Legal constraints on the use of off-shore legal structures for investments and overseas IPOs
- Weak intellectual property protection, making it difficult to capitalize on valuable intellectual property and innovation
- Lack of a comprehensive venture capital law addressing structure and taxation of venture capital firms, making it difficult to raise institutional funds
- Shortage of management talent
- Underdeveloped systems for technology transfer between research institutions and companies that can commercialize innovations
- Substantial governmental control over venture capital landscape resulting in disincentives for entrepreneurs and investors

Source: Ernst & Young Venture Capital Advisory Group 2005, 5.

Competitive Conditions for Foreign Firms

The regulations governing foreign venture capital investment are chaotic and changing. Until recently, foreign venture capital firms (most of which are U.S.-based) investing in China generally have done so through the restructuring of Chinese companies into offshore investment vehicles; these enable an easier exit from investments either by selling shares on international stock markets or through a trade sale to another foreign buyer. In January of 2005, Chinese authorities brought these transactions to a virtual standstill, however, with the issuance of new regulations preventing any onshore resident from establishing,

controlling or owning shares in an offshore company, either directly or indirectly, without the approval of the Government. The regulations were intended to stop managers of SOEs receiving venture capital investments from stripping state assets and selling them cheaply to overseas companies, and to preclude domestic companies from using the overseas vehicles to gain foreign investor tax exemption status. However, they choked off legitimate transactions as well. There were no government approvals of offshore investment transactions in 2005. With only limited exceptions for transactions in process, foreign venture capital financing through offshore investment vehicles screeched to a halt in 2005 (Borrell 2005).

Then, in November of 2005, the Chinese authorities issued superseding regulations. These require registration of offshore investment vehicles with the State Administration of Foreign Exchange (SAFE), but do not require the agency's approval of the transaction. They also require repatriation of all distributions of income from the investment within a fixed time frame. Like the previous regulations, the new ones do not describe specifically the registration process, the procedures involved, the scope of review nor the time required for completion, creating substantial uncertainty for foreign venture capital investors (Hoo, *et al* 2005b). Despite this changing regulatory landscape, many U.S.-based venture capital firms have active plans for substantial investments in 2006 – spurred by China's high growth potential, the success of recent venture-backed startups on the NASDAQ including Baidu.com and China Medical Technologies – and by pent up demand after the 2005 halt in new investments (Borrell and Aragon 2005).

Bond Markets

Overall Structure

The development of China's bond market has lagged behind even that of the stock market, due in part to government dominance of the corporate bond approval process (Hirson 2005, 38). The bond market is made up of an inter-bank bond market and an exchange-traded bond market. The inter-bank bond market is a quote-driven over-the-counter (OTC) market that serves as a platform for PBOC open market operations and block trading of bonds among financial institutions. The exchange-traded bond market is order-driven and includes: government treasury bonds (T-bills), bonds issued by the policy banks (used to finance development projects) and corporate bonds. The dominant players on this market are the securities and insurance companies; banks have been excluded from the market since 1997 (CSRC 2005, 29).

The government bond market is the largest and best developed (table 4). T-bills and policy bonds account for 86 percent of all traded debt (excluding non-performing loans). At 13.7 percent of all traded debt, China's corporate bond market is one of the smallest in the emerging economies of East Asia, particularly since most of the issuances are by the policy banks. By contrast, in Malaysia, corporate issuers account for 39.4 percent of the bond market and 31.3 percent in Thailand (Asian Development Bank 2005, 5).

TABLE 4 Funds raised in China's bond markets, 2005

	Total (USD billion)	Percentage share
Government treasury bonds	86.94	47.1
Policy bonds	72.25	39.2
Corporate bonds	25.27	13.7

Source: PBOC 2006b, 24.

A state-decreed moratorium on corporate bond issues, following defaults by the SOEs, severely limited corporate bond issuances in China in the 1980s and 1990s. Although the moratorium eased in 1999, only large SOEs have been permitted to issue bonds and they must carry an unconditional and irrevocable guarantee. The market's development has been limited by regulations focused on restricting the price, interest rates and conditions of the bonds, rather than ensuring adequate financial disclosure. The dominance of industrial policy considerations in the corporate bond approval process also has limited market development (OECD 2005, 159-60).

Corporate bond market activity improved in the second half of 2005, when the PBOC allowed companies to issue commercial paper with maturities of up to one year without approval from the National Development and Reform Commission (NRDC), the agency otherwise in charge of approving corporate bond issuances. Other plans to stimulate the debt markets include: the opening of a new exchange in Shanghai dedicated to the trading of financial derivatives (after a ten-year ban following scandals involving treasury futures in the 1990s); a new OTC market to facilitate bond trading among financial institutions; and increased efforts by the CSRC to promote commercial asset-backed securities (Anderlini 2006). Opening the corporate bond market to a wider range of companies, particularly private firms, is critical to the reinvigoration of the financial sector and to reducing the over-reliance on bank loans to meet financing needs.

Competitive Conditions for Foreign Firms

China's corporate bond market is generally closed to foreign issuers (EIU 2006d,130). Outside of the corporate bond market, however, China implemented reforms in 2005 that provided some additional opportunities for foreign bond issuers and investors. In October, China announced that it would, for the first time, allow foreign issuing entities into the domestic market, permitting the International Financial Corporation of the World Bank and the Asian Development Bank to issue RMB-denominated Panda Bonds, to be used to fund private-sector development. China hopes that the opening will bring international finance-related skills and more issuer diversity to the bond market (Asia Pulse 2005a). On the domestic interbank bond market, foreign capital commercial banks recently have been permitted to join the bond underwriting consortium to underwrite bond issues. Foreign bank transactions in the interbank bond market have been increasing since 2001 and continued an upward trend in 2005 (Asia Pulse 2005b). Also, Qualified Foreign Institutional Investors (QFIIs) are permitted to invest in bonds listed on the stock exchange, subject to quotas. Despite this measured progress, there has been no loosening of the corporate bond approval process to permit the expansion and diversification of the corporate bond market.

Conclusions

Banks, stocks, bonds and venture capital act as financial intermediaries that, in a well functioning system, supply capital to the efficient users and weed out the inefficient ones. Thus, banks monitor firm profitability and performance of loans, stock and venture capital markets provide a market for governance and bond markets price risk. These valuable functions do not occur efficiently in China; private enterprise is hampered and inefficient enterprises are kept afloat by "policy lending" (making sure that favored borrowers get capital). Given the limitations of the financial sector described here, it is perhaps surprising that China consistently has attained high rates of economic growth. Not all SOEs are inefficient, and private firms that are able to access the necessary capital, often on the informal markets, have contributed greatly. Redirecting more financing from SOEs to private enterprises could increase the efficiency of investment and significantly improve returns for the large number of households that hold their savings in low-yield bank deposits and in cash. Greater access to the banking, equity, venture capital and debt markets for domestic and foreign private firms, as well as increased attention to the implementation of international standards of lending and market regulation, will help foster greater internal competition and productivity within China's economy.

Reform is occurring, spurred in great measure by China's WTO commitments and the need to make fundamental improvements prior to December of 2006 when foreign banks are to be permitted entry on a national treatment basis. Further analysis, once the changes to the regulations governing foreign banks have taken effect, would better inform the discussion of the evolution of China's financial sector.

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U.S. Corn Sweeteners and Mexican Sugar: Agreement at Last!

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Abstract

This article covers major events in the long-standing dispute between the United States and Mexico regarding bilateral sugar and nonsugar sweetener trade. It discusses the rulings of the World Trade Organization (WTO) in disputes between the two countries regarding the antidumping duties Mexico levied on its nonsugar sweetener imports from the United States (1997-2001), and the taxes Mexico subsequently levied on the sale of products containing such sweeteners (2002-2006). In both disputes the WTO ruled in favor of the United States. These WTO rulings, as well as changes in the supply and demand of sugar and other sweeteners that began taking place in the second half of 2005 helped create the conditions that led to a bilateral agreement on sugar and nonsugar sweeteners in July 2006.

The article also charts U.S. exports of nonsugar sweetener HTS 1702.60 in 1997-2005 to Canada and Mexico. It illustrates how Mexico's import-restraining actions substantially reduced U.S. sales of nonsugar sweeteners to their market in 2002-2004, and reduced overall U.S. exports of this commodity.

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Introduction

The long-standing bilateral dispute over U.S. access to Mexico's corn sweetener market passed through an important phase during 2005, and was finally resolved in July, 2006. In October 2005, a WTO dispute panel issued its determination supporting the United States on all its major claims against a 20 percent tax Mexico levies on beverages that are made with sweeteners other than cane sugar, including high-fructose corn syrup (HFCS) (WTO 2005; USTR 2005). These taxes are aimed mainly at imports of HFCS from the United States, the primary supplier of most nonsugar sweeteners used by the Mexican beverage industry. Mexico produces little HFCS compared to its production of cane sugar. Virtually all cane sugar contained in Mexican beverages is produced domestically.

The WTO panel determined that the Mexican beverage tax discriminates against HFCS imported from the United States. The tax is imposed on the distribution and sale of beverages that contain nonsugar sweeteners,[2] that are directly competitive with such beverages containing sugar. It is not imposed on those beverages that contain cane sugar, because cane sugar is supplied domestically. The panel concluded that such discrimination violated Article III:2 of the General Agreement on Tariffs and Trade (GATT) of 1994, which prohibits discriminatory taxes.[3] The panel also stated that bookkeeping practices, as imposed on imported sweeteners, were not consistent with GATT Article III:4.[4]

Notably the WTO panel rejected Mexico's request that it leave jurisdiction in this case to a North American Free Trade Agreement (NAFTA) dispute settlement panel, stating that WTO panels may not decline to exercise

[2] The tax is imposed on the commissioning, mediation, agency, representation, brokerage, consignment, and distribution of soft/drinks and beverages using sweeteners other than cane sugar.

[3] Article III:2 provides that "The products of the territory of any contracting party imported into the territory of any other contracting party shall not be subject, directly or indirectly, to internal taxes or other internal charges of any kind in excess of those applied, directly or indirectly, to like domestic products."

[4] Article III:4 provides that "The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect to all laws and regulations, and requirements affecting their international sale, offering for sale, purchase, transportation, distribution, or use."

jurisdiction over any dispute properly brought before them. Despite the WTO ruling, the Mexican legislature approved a one-year extension of the controversial tax in November 2005.

In December 2005, Mexico informed the WTO that it would appeal the panel's ruling on grounds of an exception provided by GATT Article XX(d).[5] Mexico explained that its tax on sweetners was needed to secure U.S. compliance with NAFTA in granting access for Mexican sugar to the U.S. market, discussed in more detail below. However, the Appellate Body disagreed with the applicability of GATT Article XX(d) to Mexico's defense, and the appeal was rejected in March 2006 (USTR 2006(a)). The dispute settlement panel adopted the Appellate Body report and the panel report on March 24, 2006.[6]

Coinciding with these developments in the WTO, changes in the supply of and demand for all sweeteners, including sugar in both countries provided an impetus to resolution of the sweetener dispute. Agreement was reached on July 27, 2006, calling for the termination of the tax on HFCS, well before January 1, 2008 – the date slated by NAFTA for free trade in sweeteners. The Mexican Government repealed this tax on January 1, 2007.

Background

Mexico imposed the beverage tax in question in January 1, 2002, levying it on soft drinks and other beverages (as well as on syrups and other products that can be diluted to produce soft drinks and beverages) using corn sweeteners. Although the tax had been temporarily suspended by the Fox administration, the Mexican Supreme Court ruled the suspension unconstitutional and reinstated the tax in July 2002. In March 2004, the United States requested consultations under WTO dispute settlement procedures, and in July 2004, a WTO panel was established to review the dispute. Following the 2002 Supreme Court ruling, the Mexican Government renewed the tax each year – even in 2005, after the WTO determination against it earlier in the year (*Inside U.S. Trade* 2005).

Levying this tax was the Mexican Government's most recent act in its quest to reverse a shift towards the use of HFCS from domestic sugar in beverages and processed foods. Concerned about Mexico's sugar surplus and limited access

[5] Article XX sets out grounds for exceptions to GATT standards. Section (d) in particular states: necessary to secure compliance with laws or regulations which are not inconsistent with the provisions of this Agreement, including those relating to customs enforcement, the enforcement of monopolies operated under paragraph 4 of Article II and Article XVII, the protection of patents, trade marks and copyrights, and the prevention of deceptive practices.

[6] See, http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds308_e.htm

to the U.S. sugar market, Mexican authorities took measures to restrict the use of cheaper HFCS in these products.

The imposition of the beverage tax had been preceded by lengthy Mexican antidumping action against HFCS imports from the United States. Such action began in 1997; as with the beverage tax, it was also subject to U.S. challenge in the WTO. In February 2000, the WTO's Dispute Settlement Body (DSB) adopted a panel report concluding Mexico's antidumping duties on U.S. sweeteners were not in accordance with the WTO Antidumping Agreement. Mexico then issued a new determination justifying imposition of antidumping duties on U.S. sweetners. The United States challenged the new Mexico determination as inconsistent with the DSB's prior action. A dispute settlement panel and the WTO Appellate Body agreed. In November 2001, the DSB adopted a report that Mexico's new determination was also inconsistent with the WTO Antidumping Agreement.

The Government of Mexico was prompted by the failure of its antidumping action to turn to an alternative way of impeding imports of U.S. corn sweeteners – the beverage tax. The antidumping duties were removed in May 2002, and the beverage tax was imposed earlier, in January 2002.

The table and figure below show the effects of the antidumping action on U.S. exports to Mexico of HFCS 55[7] and HFCS 90 (both included in HTS subheading 1702.60) during 1997-2001, as well as the effects of the tax on U.S. exports to Mexico of beverages containing such sweeteners during 2001-2005.

Beginning in 1997, when Mexico started its antidumping action against U.S. corn sweeteners, U.S. exports to Mexico of HFCS 55 and HFCS 90 began to decline. The decline accelerated sharply following the imposition of the beverage tax in January 2002. In 2002, U.S. exports to Mexico dropped by two thirds compared with 2001. Mexico's share of total U.S. exports dropped from 63 percent in 1997 to 41 percent in 2001, while dumping duties were in effect. Thereafter, the tax rendered the use of HFCS in soft drinks and syrups cost-prohibitive for Mexican producers, and U.S. exports were at relatively low levels in 2002, 2003, and 2004. Mexico dropped to the fifth-largest destination of U.S. corn sweeteners after Canada, China, Thailand, and Japan. Notably U.S. exports to Mexico rebounded in 2005 for reasons that will be discussed later. The table and chart show that the virtual loss of the Mexican market significantly affected total U.S. exports of HFCS. Such exports have remained well below their peak reached in 1998, even though they strengthened to some other markets.

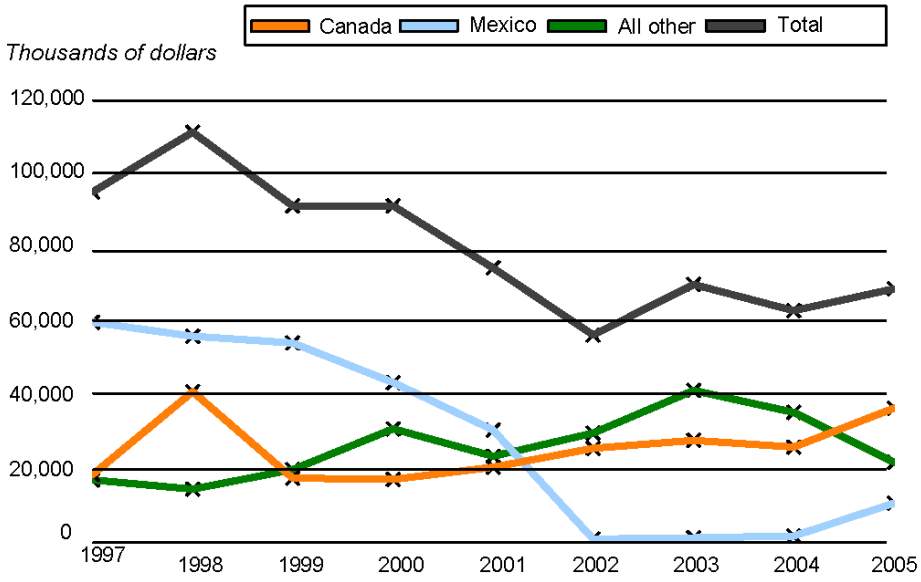
[7] HFCS 55 is one of the most commonly produced and traded non-sugar sweeteners.

TABLE 1 HTS-1702.60: Fructose and fructose syrup containing in the dry state more than 50 percent by weight of fructose, U.S. domestic exports, annual, 1997-2005 ($1,000)

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005	Percent change 2004/ 2005
Canada	18,394	40,804	17,426	17,054	20,406	25,496	27,532	25,853	36,301	40.4
Mexico	59,585	55,764	53,921	43,333	30,490	965	1,232	1,691	10,645	529.7
All other	16,828	14,438	19,752	30,741	23,356	29,593	41,053	35,189	21,655	-38.5
Total	94,807	111,006	91,099	91,128	74,252	56,154	69,817	62,733	68,601	9.4

Source: Compiled from official statistics of the U.S. Department of Commerce 2006.

Figure 1 U.S. Exports of HTS 1702.60



Source: Compiled from official statistics of the U.S. Department of Commerce 2006.

Canada has been the leading destination since 1998. U.S. corn refiners producing HFCS repeatedly complained about suffering heavy losses from Mexico's efforts to block their exports, prompting U.S. authorities to initiate WTO dispute settlement procedures (Corn Refiners Association 2005).

Access of Mexican Sugar to the United States

The dispute over U.S. access to Mexico for HFCS was spawned by Mexico's dissatisfaction with its own access for sugar to the United States. Since the inception of NAFTA in 1994, U.S. imports of sugar from Mexico–raw and refined sugar—have been small compared with imports from some other countries in accordance with pre-NAFTA patterns of U.S. imports by supplier.[8] During most of this period, Mexico accounted for only 1 to 6 percent by value of all US. sugar imports. In 2005, however, Mexico's share of U.S. imports rebounded from 3.7 percent in 2004 to 14.8 percent of total U.S. imports as Mexico moved up to become the second-ranking U.S. sugar supplier after Brazil. That year, with its soaring sugar exports to the United States, Mexico outranked other U.S. suppliers who were leading in 2003 and 2004, such as Guatemala, the Dominican Republic, and the Philippines. The reasons for this will be discussed later in this article.

Mexico believed that it should have provided a much larger portion of U.S. sugar imports during the NAFTA years, alleging that, under NAFTA, Mexican sugar surplus should have had unlimited access to the U.S. market free of duty (WTO 2005, 22). In Mexico's view, NAFTA defines surplus as output less consumption of sugar for a given fiscal year (FY), i.e. October 1 through September 30, as provided in the initial August 1992 NAFTA agreement, signed by each country's president in late 1992.

According to the United States, a revised and now valid NAFTA provision concerning sugar trade placed more restrictions on imports of Mexican sugar allowed to enter the United States free of duty than the original NAFTA had (USDA, ERS 1999, 18). The revised version provides that (a) Mexico's "net surplus position" (NSP) must be calculated by deducting from the country's sugar output not only its sugar consumption, but also its HFCS consumption, and that (b) in 2001-2007, duty-free entry of Mexican sugar must be capped at 250,000 metric tons raw value (MTRV), regardless of the size of Mexico's surplus. These revised NAFTA provisions are contained in the so-called "side letter" from then USTR Michael A. Kantor of Nov. 3, 1993 to Jaime Serra Puche, Mexico's then Secretary of Commerce and Industrial Development (SECOFI). The side letter was included along with other NAFTA documents submitted to the Mexican Congress with the implementing bill. All agree that under NAFTA, Mexico will have unlimited duty-free access to the U.S. sugar market beginning January 1, 2008.

[8] The United States allocates its raw cane sugar tariff-rate quota (TRQ) to 40 quota-holding countries, based on a representative period (1975-81) during which trade had been relatively unrestricted (Haley 2001).

Mexico has disputed the validity of the revised NAFTA provision, pointing repeatedly to U.S. noncompliance with NAFTA for not allowing all the sugar that Mexico considered "net surplus" to enter the United States free of duty. As mentioned earlier, Mexico argued before the WTO in the HFCS case that the disputed beverage tax it imposed was justified as a means of securing U.S. compliance under NAFTA with respect to sugar.

Sugar is one of the first industries developed by the Spanish colonizers in Mexico. Even though sugar has always been a major industry in the country, Mexico had been generally a net importer prior to NAFTA, because of its inefficient production and large domestic consumption. In the 1990s, Mexican sugar mills sharply increased their output, and by 1995, Mexico was not only capable of meeting domestic demand for sugar, but became a sugar exporter. These positive developments resulted from privatization, technological improvements, and support by the Government of Mexico.

Like the United States, Mexico has a protected sugar market, with domestic prices generally well above world market prices, although recent conditions in the world market have narrowed the gap (U.S. Department of State 2005).[9] Since 1997, the government has determined the amount of sugar that can be marketed domestically, controlling thereby the volume to be allocated for exports and stock piling. Government support enables the domestic sugar industry to maintain both high domestic prices and high production levels.

However, despite government assistance and the resulting high domestic sales prices, several Mexican sugar mills became heavily indebted. Their productivity gains and marketing expertise were insufficient for competitiveness of Mexican sugar on world markets, especially at times when world market prices of sugar were falling. The debt load of sugar mills prompted the administration to re-nationalize 27 out of 60 functioning sugar mills in September 2001.

Mexico's sugar growers and the administration had been embroiled in a fight over whether direct, up-front, guaranteed government subsidies to growers should continue (as the growers wanted) or the market should be allowed to determine the prices at which cane sugar is sold to processors (as the administration wanted) (SourceMex Economic News & Analysis 2005]. Arguing that subsidized, high domestic prices for sugar cane are hurting the sugar-processing industry efforts to modernize, in January 2005, the Fox Administration withdrew an 1993 sugar decree that provided for these high subsidies. However, the Mexican Congress voted to bring back the cancelled legislation in August 2005, when a "Law on Sustainable Development" re-

[9] More recently global supply and demand conditions raised world market prices of sugar and narrowed the gap.

established the role of the Federal Government in setting guaranteed prices for sugar cane, and determining the growers' share of sugar sales revenues (Haley 2005, 2).

Recent Developments in Supply and Demand of Sweeteners and Sugar in the United States and Mexico

In the second half of 2005, bilateral negotiations on sweeteners reflected the changes that have taken place in both partners' sugar output, U.S. demand for sugar, and Mexican demand for corn sweeteners. The U.S. Department of Agriculture (USDA) lowered expectations of U.S. sugar production, because of hurricanes and other weather-related events in August and September. The resulting shortage of raw cane sugar and refined beet and cane sugar was exacerbated by the closure of one sugar refinery, and interruptions in the operation of another in Louisiana, due to Hurricane Katrina. USDA determined that U.S. sugar supplies might be insufficient to meet the unexpectedly high domestic demand in FY 2005 and FY 2006. By contrast, Mexican sugar cane production, aided by excellent weather, reached record amounts in 2005.

Because of these changes in supply and demand, the United States and Mexico took steps to restart bilateral trade in sugar and other sweeteners, separate from the WTO action. On September 30, 2005, the United States opened up the duty-free tariff-rate quota (TRQ) under NAFTA for imports of 250,000 MTRV of Mexican sugar for FY 2006, on grounds that Mexico qualified as a surplus producer (USDA, OC 2005(a)). The United States and the Mexican Secretary of Agriculture further negotiated additional, over-quota quantities of refined sugar imports from Mexico to the United States duty-free under a global U.S. TRQ, which was established for entry under a first-come first-served basis. The purpose of this TRQ was to cover the shortfall of U.S. imports from those Central American countries that were affected by late hurricanes in 2005, and were unable to fill their TRQ for FY 2005 (USDA, OC 2005(b)). In addition, Mexican sugar could enter the United States at relatively low duties under a declining tariff schedule established by NAFTA. As a result of these new provisions, U.S. imports of Mexican raw cane sugar increased by 723 percent and refined sugar imports increased by 1,278 percent in 2005 compared with 2004, making Mexico the number two U.S. source of sugar, after Brazil (USDA/FAS 2005(a), 3).

Mexico opened its doors to U.S. corn sweeteners, too. The Secretary of Economy (SE) announced on September 30, 2005 that, in the spirit of establishing a more amicable environment in which to resolve ongoing bilateral sweetener issues, it was prepared under certain conditions to issue import permits for up to 250,000 metric tons of corn sweeteners

between October 1, 2005 through September 30, 2006 (USDA/FAS 2005(b)). In November 2005, additional Mexican announcements specified the tariff numbers of the eligible sweeteners and the procedural requirements for issuing import permits (USDA/FAS 2005(c)).

Mexican authorities may have had another reason for reopening the Mexican market for U.S. corn sweeteners. Domestic HFCS consumption has been on the increase since late 2004, despite the authorities' efforts to induce the beverage industry to use sugar rather than corn sweeteners in its products. A growing number of beverage producers obtained "amparo"-s (court injunctions), which waive the 20 percent tax on beverages containing HFCS on a case-by-case basis.[10] While Mexican beverage producers may obtain "amparo"s for corn sweeteners from the United States or Canada, the 250,000 MT quota for U.S. imports cannot be exceeded. This development reignited Mexican demand for U.S. HFCS, since domestic capacity for producing HFCS is limited, and short-term prospects for expanding it reportedly are dim.[11]

The table and chart above show U.S. exports of HFCS to Mexico rebounding in 2005. The United States exported $10.6 million worth of HFCS-55 and HFCS-90 to Mexico compared with $1.7 million in of 2004 – a 530 percent increase. Mexico accounted for more than 15 percent of total U.S. exports in 2005, and became the second largest destination for U.S. exports after Canada, followed closely by China, which accounted for most of the rapid growth of imports in the "All Other" category of the table above.

The Agreement

The United States and Mexico thus entered the year 2006 with less tension over sugar and sweetener trade, manifest by some measure of optimism expressed by U.S. officials.[12] Yet, the 20 percent tax, ruled inconsistent with Mexico's WTO

[10] While Mexican beverage producers may obtain "amparo"s for corn sweeteners from the United States or Canada, the 250,000 MT quota for U.S. imports cannot be exceeded.

[11] Data on Mexican HFCS output are not available.

[12] See for example the letter of the United States Trade Representative Robert Portman to Senator Tom Harkin, Nov. 18, 2005, and the testimony of J.B. Penn, United States Department of Agriculture, Under Secretary for Farm and Foreign Agriculture Services, before the Senate Agricultural Committee on "Review of the Implementation of the Sugar Program," May 10, 2006.

obligations by the WTO Dispute Settlement Panel, continued to be levied on soft drinks containing U.S. sweeteners to Mexico.

This issue was finally resolved on July 27, 2006, when the United States and Mexico announced the long-awaited agreement set forth in an exchange of letters between the USDA and the Mexican Ministry of the Economy. The accord includes Mexico's commitment that duties on HFCS-containing beverages will no longer be imposed after January 1, 2007, as already communicated to the WTO earlier during the month.[13] Most important, the parties provided for reciprocal duty-free import quotas on sugar and HFCS during a transitional period of October 1, 2006 through December 31, 2007, to be followed by the removal of all barriers in mutual sugar and other sweetener trade on January 1, 2008, as mandated by NAFTA (USTR 2006(b)).

Free trade in sugar and nonsugar sweeteners will, of course, raise new concerns`to be resolved; the parties liberalizing their remaining trade-distorting measures would have to face the impact of free trade on their current sugar and sweetener programs. With respect to a future U.S. program, J. B. Penn, USDA Under Secretary said:

> The formulation of a sustainable safety net for American sugarcane and sugar beet producers in the future must consider the challenges presented by the rapidly changing domestic and international environment. Sugar program administration has become increasingly difficult within the past year and is not expected to get any easier. The development of an appropriate policy for 2008 market conditions and beyond will require foresight and innovative thinking[14].

[13] On July 3, 2006, the United States and Mexico submitted a joint letter to the WTO Dispute Settlement Body, stating that they agreed on the "a reasonable time period," after which Mexico will comply with the WTO ruling [WTO 2006].

[14] Testimony of J.B. Penn, United States Department of Agriculture, Under Secretary for Farm and Foreign Agriculture Services, before the Senate Agriculture Committee on "Review of the Implementation of the Sugar Program," May 10, 2006.

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Inbound and Outbound U.S. Direct Investment With Leading Partner Countries

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Abstract

This article surveys trends in U.S. inbound and outbound foreign direct investment (FDI) during 2000-2005. The article examines the major country and regional destinations for U.S. direct investment abroad (USDIA), and foreign direct investment in the United States (FDIUS). After a brief survey of total inbound and outbound FDI, trends are examined by region and by the most significant developed and developing country investment partner countries. Throughout the paper, the analysis pays particular attention to the multinational corporations that are the source of most FDI, along with particularly important mergers, acquisitions, and greenfield investments. By far the largest U.S. FDI partner is Europe, particularly the United Kingdom, Germany, and the Netherlands. Canada ranks second in terms of its overall FDI relationship with the United States. One-third of cumulative USDIA, equal to $623 billion in 2005, is invested in holding companies in a small number of countries, primarily in Europe and the Caribbean, making it difficult to track the final country and industry destinations of this capital, and limiting an understanding of the effects of U.S. FDI. Mexico is by far the most important FDI partner country among developing countries, for both USDIA and FDIUS.

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Introduction

This article surveys trends in U.S. inbound and outbound foreign direct investment (FDI) during the years 2000-2005. The article examines the major country and regional destinations for U.S. direct investment abroad (USDIA),[2] and foreign direct investment in the United States (FDIUS).[3]

After a brief survey of total inbound and outbound FDI, the article looks at trends by region, discussing the major sources and destinations of FDI in Europe, Asia-Pacific, the NAFTA countries, Latin America and the Caribbean, and Africa and the Middle East. The article next examines trends related to the five largest U.S. FDI partners—the United Kingdom, Canada, the Netherlands, Germany, and Japan—as defined by the sum of total inbound and outbound FDI position, or stock, a cumulative measure of FDI over time. The article concludes with a brief look at USDIA and FDIUS with developing countries, particularly Mexico, Brazil, India, and China. Throughout the paper, the analysis pays particular attention to the multinational corporations (MNCs) that are the source of most FDI, and to specific mergers, acquisitions, and greenfield investments that have contributed to the trends.

The position (stock) of USDIA has exceeded that of FDIUS in every year since 1982. Preliminary data for 2005 show the total USDIA position at $2.1 trillion, compared with an FDIUS position of $1.6 trillion. Both USDIA and FDIUS have grown steadily since 1982, averaging annually 11 percent for USDIA and 12 percent for FDIUS. For the years 2000-2005, average annual growth has been 9 percent for USDIA and 5 percent for FDIUS (USDOC BEA 2006b, 20).

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[2] USDIA is the value of U.S. investors' equity in, and net outstanding loans to, their foreign affiliates. Direct investment is considered to be "investment in which a resident of one country obtains a lasting interest in, and a degree of influence over the management of, a business enterprise in another country." The U.S. statistical definition, and the global standard adopted by the IMF, define such an interest as the ownership or control by one foreign resident of 10 percent or more of the equity shares in a foreign company. Ownership interest of less than 10 percent is defined as portfolio investment, and not included in the statistics presented herein. See USDOC BEA 2006d, 36.

[3] FDIUS is the value of foreign investors' equity in, and net outstanding loans to, their U.S. affiliates.

Foreign Direct Investment – Key Terms and Definitions

Direct investment. Investment in which a resident of one country obtains a lasting interest in, and a degree of influence over the the management of, a business enterprise in another country. For statistical purposes, USDIA is defined as a single U.S. resident owning or controlling more than 10 percent of the voting securities or equivalent of a foreign company. FDIUS is defined as a single foreign resident owning or controlling more than 10 percent of the voting securities or equivalent of a U.S. company.

Direct investment capital flows. Flows of capital across borders, either arising from transactions between affiliates in one country and parent firms in another country (reinvested earnings or intracompany loans), or funds that foreign direct investors pay to unaffiliated residents when affiliates are acquired or sold (equity capital flows). In this article, capital flows are presented on an annual basis.

Foreign affiliate. A business enterprise in which a single investor owns at least 10 percent of the voting securities or the equivalent in a business enterprise in another country.

Foreign direct investment position (stock) in the United States. The cumulative value of foreign direct investors' equity in, and net outstanding loans to, their U.S. affiliates. The position may be viewed as the foreign direct investors' net financial claims on their U.S. affiliates in the form of equity (including retained earnings) or debt.

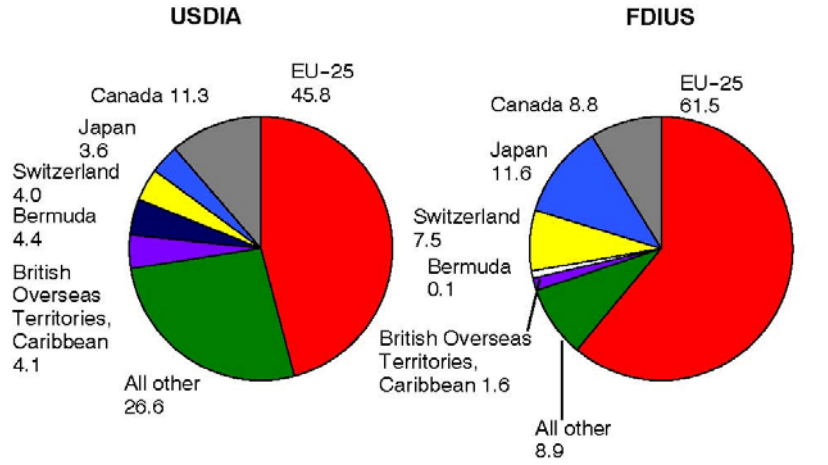
U.S. direct investment position abroad. The cumulative value of U.S. direct investors' equity in, and net outstanding loans to, their foreign affiliates. The position may be viewed as the U.S. direct investors' net financial claims on their foreign affiliates, whether in the form of equity (including reinvested earnings) or debt.

Source: USDOC, BEA, 2006d.

The majority of USDIA is invested in other developed economies, with the EU-25 accounting for 46 percent of the USDIA position in 2005, and Canada accounting for 11 percent. The North Atlantic British overseas territory of Bermuda and the British overseas territory islands in the Caribbean together accounted for 8 percent of USDIA. The Caribbean countries are a significant domicile for holding companies set up by U.S.-based corporations. The majority of the funds invested there are later reinvested in operating affiliates in third countries, largely for tax purposes. In addition, Bermuda has become an important destination for insurance industry investment in the reinsurance segment of the industry.

Likewise, most FDIUS comes from developed economies, with the EU-25 accounting for about 62 percent of FDIUS position in 2005, followed by Japan, Canada and Switzerland (figure 1). This article will closely examine the U.S. direct investment relationship by region, and with its top five foreign direct investment (FDI) partners: the United Kingdom, Canada, the Netherlands, Germany, and Japan (table 1).[4] Developing countries accounted for approximately 12 percent of USDIA and 2.5 percent of FDIUS. The article will also briefly discuss the U.S. investment relationship with several developing country investment partners: Mexico, Brazil, China, and India.

Figure 1 Inbound (FDIUS) and outbound direct investment (USDIA) position, by major investor, 2005 (percentage)



Source: USDOC, BEA

[4] Leading FDI partners are defined by the level of outbound plus inbound FDI position.

TABLE 1 Direct investment position at historical cost, leading countries, USDIA and FDIUS, 2005

Country	USDIA	FDIUS	Combined USDIA and FDIUS
All countries	2,069,983	1,635,291	3,705,274
United Kingdom	323,796	282,457	606,253
Canada	234,831	144,033	378,864
Netherlands	181,384	170,770	352,154
Germany	86,319	184,213	270,532
Japan	75,491	190,279	265,770
Switzerland	83,424	122,399	205,823
France	60,860	143,378	204,238
Luxembourg	61,615	116,736	178,351
Australia	113,385	44,061	157,446
Bermuda	90,358	1,517	91,875
Ireland	61,596	21,898	83,494
Mexico	71,423	8,653	80,076
Sweden	33,398	24,774	58,172
Singapore	48,051	2,404	50,455
Spain	43,280	7,114	50,394
Belgium	36,733	9,712	46,445
Hong Kong	37,884	2,600	40,484
Brazil	32,420	2,551	34,971
Italy	25,931	7,716	33,647
Hungary	3,402	20,329	23,731
China	16,877	481	17,358
Taiwan	13,374	3,565	16,939
Panama	5,162	11,470	16,632
Chile	9,811	129	9,940
India	8,456	1,355	9,811
Philippines	6,649	-1	6,648
Poland	5,736	-1	5,735
Russia	5,545	418	5,963
South Africa	3,594	361	3,955

Source: USDOC, BEA.
Note: Direct investment position is the sum of foreign parents' equity holdings in their U.S. affiliates (including retained earnings), plus the net outstanding loans that foreign parents have made to these affiliates. Direct investment position is negative when the value of loans made by U.S. affiliates to their foreign parent companies exceeds the value of the parents' equity holdings plus the value of loans made by the parent to its affiliate companies.

MNCs may establish a commercial presence overseas for a variety of reasons, including better access to foreign markets, lower labor costs, access to natural resources, and the ability to more closely monitor proprietary information and manufacturing processes. Individual FDI decisions by U.S.-based companies may reflect these or other factors or all factors at the same time. Potential benefits of direct investment for host countries include greater access to technology, job creation, additional tax revenue, and access to capital with which to fuel economic growth, pursue social objectives, and offset temporary trade imbalances. Inbound FDI in particular reflects the natural advantages of doing business in the United States, including access to a large, sophisticated market; an educated, highly productive labor force; and the sophisticated, well-financed U.S. capital markets. MNCs can invest abroad through two modes of entry: mergers and acquisitions (M&A) or greenfield investments. Acquisitions tend to compose the largest share of new FDI in developed countries. Greenfield investments are more prevalent in developing countries, where there are fewer established firms that make attractive takeover targets (UNCTAD 2005,10). In the United States, for example, an average of 86 percent of all new inbound FDI outlays during 1992-2005 were in the form of acquisitions, with the level reaching 96 percent during the years 1999 and 2000.[5]

Direct Investment Data

This article relies primarily on the balance of payments and associated direct investment position data provided by the U.S. Department of Commerce (USDOC), Bureau of Economic Analysis (BEA). Direct investment position (stock) data reflect the cumulative value of parent companies' investments in their affiliates, while capital flows data reflect cross-border transfers of capital during a given time period.[6] The analysis presented in this article concentrates on the data years 2000-2005, which reflect the most recent available data for direct investment position and capital flows. The BEA data are supplemented

[5] The exceptionally high share of M&A in new investment outlays in 1999 and 2000 was due to the large number and high value of M&A in high-technology industries during the stock market boom of the late 1990s. USDOC, BEA, *Survey,* June 2006, 32.

[6] The data are presented on an historical-cost basis, which reflects the value of investments at the time of investment, with no adjustment for inflation, current cost, or change in market value. Adjusted data are not available for the country and industry breakdowns presented in this article. For a discussion of issues regarding the deflation of direct investment data, see USDOC, BEA, 1999, 3-15.

with data from UNCTAD, the World Bank, individual country statistical agencies, private databases, individual company information, and press reports, as appropriate.

U.S. Inbound vs. Outbound Investment

As noted above, the overall USDIA position was $2.1 trillion in 2005, compared with $1.6 trillion for FDIUS. By comparison, BEA also estimates the direct investment position for both inbound and outbound FDI on a current-cost and a market-value basis, which are presented in table 2. The current cost estimate reflects the estimated current cost values of "U.S. and foreign parents' share of their affiliates' investment in plant, and equipment, land, and inventories." The estimate of market value is an estimate of the "value of the equity portion of direct investment, using indexes of stock market prices" (USDOC BEA 2006b, 21).

Table 3 presents overall inbound and outbound FDI stock and flows from 2000 through 2005. The USDIA position has consistently been higher than the FDIUS position (figure 2). By contrast, annual capital inflows (FDIUS) were higher than capital outflows (USDIA) for much of the same period (figure 3).

TABLE 2 Alternative estimates of U.S. direct investment position, 2005

	USDIA	FDIUS
Historical cost	2,069,983	1,635,291
Current cost	2,453,933	1,874,263
Market value	3,524,459	2,797,165

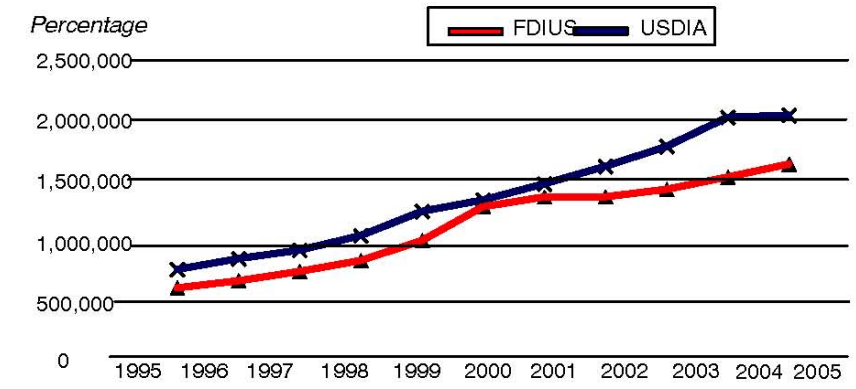
Source: USDOC, BEA.

TABLE 3 Direct investment position and capital flows, 2000-2005
(million dollars)

	2000	2001	2002	2003	2004	2005
USDIA						
Outflows	142,627	124,873	134,946	119,406	222,400	-12,700
Position .	1,316,247	1,460,352	1,616,548	1,791,891	2,051,204	2,069,983
FDIUS						
Inflows . .	314,007	159,461	71,331	56,834	122,400	99,400
Position .	1,256,867	1,343,987	1,344,697	1,410,672	1,520,729	1,635,291

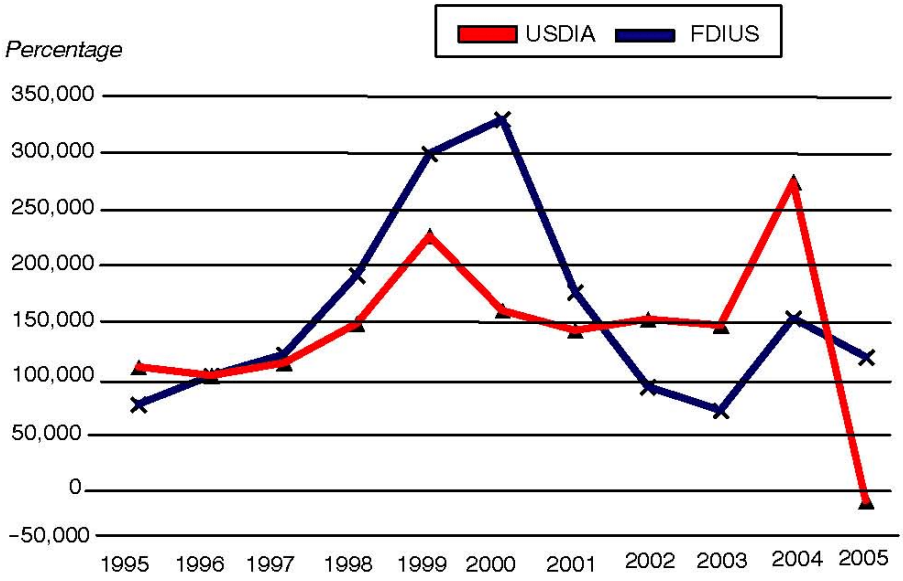
Source: USDOC, BEA.

Figure 2 U.S. direct investment position, 1995-2005



Source: USDOC, BEA.

Figure 3 U.S. capital outflows (USDIA) and inflows (FDIUS), 1995–2005



Source: USDOC, BEA.

Annual capital flows data tend to reflect large individual transactions such as mergers, acquisitions, greenfield investments in new facilities such as factories, or reinvestment decisions by firms. These vary widely from year to year, so the trend is much more volatile than the trend in FDI position, which reflects cumulative investment over time. The high level of U.S. capital inflows between 1999 and 2001 reflects the strong foreign interest in U.S. technology and telecommunications firms during the stock market boom years, prior to the market downturn in 2001.

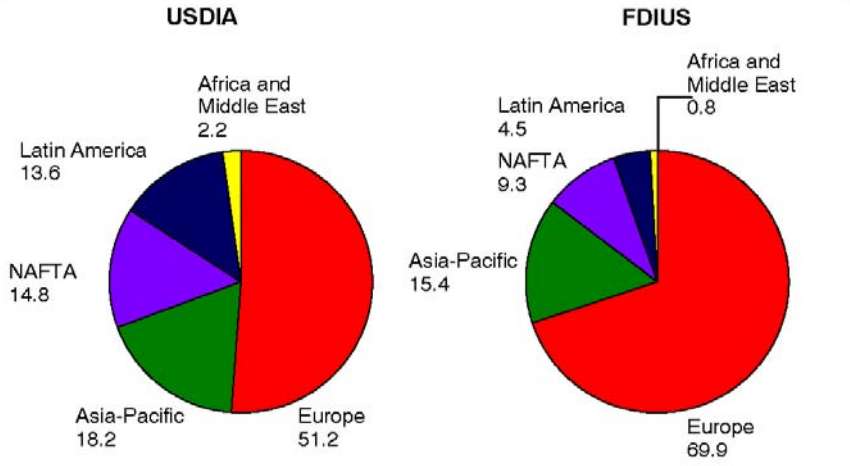
Foreign Direct Investment by Region

Europe[7]

Europe accounted for 51 percent of the USDIA position ($1.06 trillion) and 70 percent of the FDIUS position ($1.14 trillion) in 2005 (figure 4). Within Europe, the largest industry destination for USDIA in 2005 was holding companies, with 33 percent of the total (table 4). Holding companies are designed primarily for tax purposes, to channel funds to operating companies in a wide variety of industries. Holding companies, as a share of the total USDIA position, increased from just under 10 percent in 1982, to 35 percent in 2004, before falling back to 30 percent in 2005. In 2004, the USDIA position in holding companies was valued at $724.2 billion on an historical-cost basis, with USDIA in holding companies in the Netherlands valued at $125.3 billion. In 2005, the overall global USDIA position in holding companies declined to $623.1 billion, with a decline in Europe alone of $92.3 billion. The decline was largely due to the American Jobs Creation Act of 2004, which offered a one-time tax incentive to U.S. firms to repatriate profits from overseas operations back to the United States. (USDOC BEA., 2006b, 24). The largest European destinations for investment in holding companies were the Netherlands, the United Kingdom, Luxembourg, and Switzerland. Outside Europe, Bermuda and the British overseas territory islands of the Caribbean are also significant destinations for USDIA in holding companies (table 4) (USDOC BEA 2006b, 24).

[7] Europe includes the EU-25, Norway, Switzerland, Iceland, Russia, the former Soviet republics, and the countries of Eastern Europe that are not EU members.

Figure 4 USDIA and FDIUS position by region, 2005 (percentage)



Source: Commission calculations based on data from USDOC, BEA.
Note: Latin America includes the Caribbean countries but does not include Mexico, NAFTA includes Canada and Mexico. Europe includes the EU-member countries and countries that are not EU members.

The high level of investment in holding companies makes it difficult to determine the final industry destination of U.S. outbound investment. Official U.S. Government statistics track capital outflows from U.S. parent firms only to the first foreign affiliate recipient. When a U.S. parent firm invests in a foreign affiliate holding company, which then sends the capital onward to an operating company in another industry and/or another country, U.S. FDI data reflect only the first step of investment in the holding company, not the final industry and/or country destination of these capital outflows. However, it is possible to gain some insight into the final industry destination of FDI by comparing the USDIA position as measured by industry of the U.S. parent to the USDIA position measured by the industry of the foreign affiliate (table 5).

TABLE 4 USDIA position in holding companies, selected countries, 2004 and 2005

Country/Region	2004 USDIA position in holding companies (Million dollars)	2004 Holding company share of total USDIA position (%)	2004 Capital outflows to holding companies (Million dollars)
Europe	437,973	39.6	34,226
Luxembourg	72,589	89.5	5,314
Netherlands	125,272	61.3	9,100
Switzerland	62,148	58.2	3,974
United Kingdom	84,465	27.1	9,901
Bermuda	37,534	43.4	1,174
British Islands, Caribbean	56,456	69.9	5,716
All countries	724,229	35.3	101,353

Country/Region	2005 USDIA position in holding companies (Million dollars)	2005 Holding company share of total USDIA position (%)	2005 Capital outflows to holding companies (Million dollars)
Europe	345,629	32.6	-86,945
Luxembourg	51,418	83.5	-16,195
Netherlands	95,071	52.4	-33,461
Switzerland	37,702	45.2	-12,699
United Kingdom	78,467	24.2	-4,726
Bermuda	36,015	39.9	-14,861
British Islands, Caribbean	53,497	62.7	-8,897
All countries	623,076	30.1	-118,634

Source: USDOC, BEA.

TABLE 5 USDIA position by industry of affiliate compared to industry of parent, all countries, 2005

Industry	USDIA position by industry of affiliate	USDIA position by industry of US parent	Difference
All industries	2,069,983	2,069,983	0
Holding companies	623,076	16,355	606,721
Finance	393,723	318,467	75,256
Wholesale	142,960	71,075	71,885
Mining	114,386	67,647	46,739
Other industries	169,424	180,358	(10,934)
Information	55,479	77,859	(22,380)
Dep inst	70,331	98,264	(27,933)
Prof, sci, tech	49,202	83,619	(34,417)
Manufacturing	451,402	1,156,340	(704,938)
Elec equip	13,079	11,868	1,211
Metals	21,671	36,983	(15,312)
Machinery	29,224	49,364	(20,140)
Food	31,524	60,886	(29,362)
Comp/elec products	58,785	150,257	(91,472)
Chemicals	109,354	246,844	(137,490)
Transport equip	48930	248,596	(199,666)
Other mfg	138836	351,543	(212,707)

Source: USDOC, BEA, 2006.

Cases in which the USDIA position, as measured by the industry of the parent, differs from the position as measured by the industry of the affiliate, are most likely to be situations in which FDI is directed first to a holding company, then subsequently reinvested in an operating company. For example, a U.S. manufacturer may invest in a holding company in Bermuda, which then invests in an operating company affiliate such as a factory in India. U.S. FDI data show only the first investment in Bermuda, reported by the industry of the affiliate. When the data are compared by the industry of the parent (manufacturing) vs. the industry of the affiliate (holding companies, included in the service sector), a discrepancy appears. An examination of the data shows that for four industries (holding companies, finance, wholesale trade, and mining), the USDIA position is significantly larger when categorized by the industry of the affiliate, compared to data presented by the industry of the parent. This signifies that many U.S. parent firms have invested in foreign affiliates in an industry

different from their own primary industry.[8] The largest such discrepancy appears in the category of holding companies. The majority of such funds directed toward holding companies are presumably reinvested in operating companies, probably in third countries.

For 2005, the USDIA position in foreign holding companies was $16.4 billion when measured by the industry of the foreign parent, compared with $623.1 billion when measured by industry of the affiliate. The reverse is true for manufacturing firms, implying that U.S.-based MNCs engaged primarily in manufacturing industries have invested in foreign affiliates that act as holding companies, and also in affiliates in the wholesale trade, finance, and mining industries. This is particularly true for parent firms that are manufacturers of chemicals, machinery, transportation equipment; and computers and electronic equipment. These U.S.-based manufacturing firms have invested in holding companies aimed at onward investment, and also in wholesale trade affiliates used to distribute their products in overseas markets, finance companies likely used to finance the purchase of those finished products, and mining companies, presumably as a source of raw materials for manufacturing operations. In 2005, the USDIA position in manufacturing was $451.4 billion when classified by the industry of the affiliate, but $1,156.3 billion by industry of the parent.

The manufacturing sector, led by the chemicals industry, accounted for the second--largest share of USDIA in Europe and the largest share of FDIUS. The chemicals industry includes pharmaceuticals manufacturing, which accounts for a large share of both USDIA and FDIUS (figure 5). The USDIA position in the European chemicals industry was $68.0 billion in 2005, half the $136.0 billion value of the European FDIUS position in the chemicals industry. The United Kingdom, the Netherlands, and the Republic of Ireland held the largest shares of USDIA in the chemicals industry. European leaders in FDIUS in chemicals were the United Kingdom, Switzerland, the Netherlands, and Germany. Financial services was the other leading industry for USDIA in Europe, with FDI stock in depository institutions of $39.0 billion, and FDI in other financial services of $176.8 billion, particularly in the United Kingdom.

For FDIUS from Europe, the financial services, wholesale trade, information,[9] and depository institutions were leading industries in 2005 (table 6).

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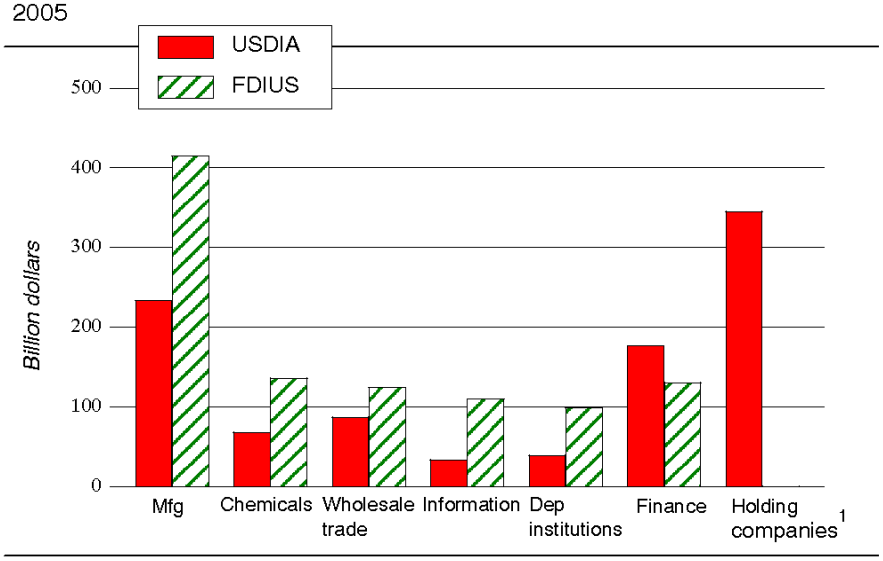
[8] To understand the examples of finance and wholesale trade, consider the case of an automobile manufacturer investing aborad in an auto distribution company, or an finance firm aimed at providing financing for auto loans. An aluminum manufacturer or other raw materials processor might also invest abroad in a mining affiliate.

[9] Includes publishing, motion picture and sound recording, broadcasting, telecommunications, information services, and data processing services.

Figure 5 Europe, USDIA position vs. FDIUS position, by selected industry, 2005



Source: USDOC, BEA.

[1] The Bureau of Economics Analysis does not report regional statistics for FDIUS in holding companies. However, the FDIUS position in holding companies from all countries was $93.9 billion in 2005.

Asia Pacific

The Asia-Pacific region holds the second-largest investment relationship with the United States, accounting for 18 percent of USDIA stock and 15 percent of FDIUS stock. U.S. outbound investment stock in the region totaled $376.8 billion in 2005, with inbound FDI of $252.6 billion. As in Europe, the largest share of USDIA position was holding companies, valued at $122.7 billion (table 7), primarily representing FDI in Australia. Overall USDIA stock in Australia increased dramatically in 2004, vaulting Australia into fourth place in 2005, from 11th in 1999.[10] The change is largely due to the decision by Australia-based News Corp. to shift its headquarters site to the United States during 2004. As a result of this shift, all of News Corp.'s assets in Australia were reclassified as U.S.

[10] Data for USDIA in Australia are not available for 2004. BEA suppressed the data to avoid disclosure of individual company information.

equity in Australian affiliates, the primary factor in a shift in USDIA stock in Australia from $48.9 billion in 2003 to $113.4 billion in 2005.[11]

TABLE 6 Europe, USDIA position and FDIUS position, Europe, by selected industry and country, 2005

Industry		Europe	France	Germany	Ireland
Manufacturing	USDIA	233,608	22,214	22,200	22,949
	FDIUS	414,852	45,480	70,943	5,268
Chemicals	USDIA	67,987	6,955	4,078	10,696
	FDIUS	135,975	16,163	26,755	616
Wholesale trade	USDIA	86,795	5,909	18,964	4,109
	FDIUS	124,349	13,316	14,972	402
Information	USDIA	33,514	1,559	2,818	13,260
	FDIUS	109,677	26,202	29,971	
Depository institutions . .	USDIA	39,021	1,901	1,385	
	FDIUS	98,544	16,194	16,445	
Finance & insurance . .	USDIA	176,838	4,342	13,560	7,002
	FDIUS	130,356	28,215	18,353	1,072
		Netherlands	Switzerland	United Kingdom	
Manufacturing	USDIA	29,508	13,059	60,355	
	FDIUS	72,459	76,385	76,792	
Chemicals	USDIA	10,583	4,835	13,136	
	FDIUS	25,024	26,972	29,714	
Wholesale trade	USDIA	14,152	11,306	13,963	
	FDIUS	9,691	7,055	62,392	
Information	USDIA	4,385	(2,651)	6,937	
	FDIUS	12,283		17,918	
Depository institutions . .	USDIA	49	8,610	17,018	
	FDIUS				
Finance & insurance . .	USDIA	28,695	11,555	85,474	
	FDIUS	40,847	19,637		

Source: USDOC, BEA.
Note: Empty cells imply no data are available.

[11] News Corp. completed its re-incorporation in the United States in November 2004. Because BEA does not disclose the activities of individual companies, the explanation for the change in the scale of USDIA in Australia between 2003 and 2005 is compiled from company press releases and other reports. See News Corp. 2007.

TABLE 7 USDIA position and FDIUS position, Asia-Pacific region, selected industries, 2005

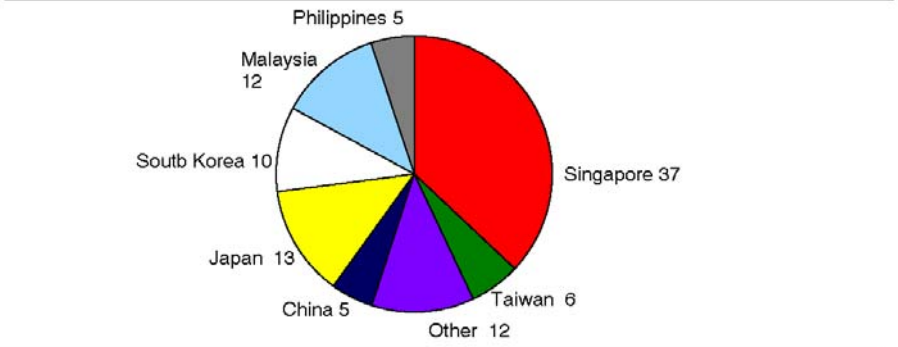
Industry		Asia-Pacific	Australia	Hong Kong	Japan	South Korea	Singapore
Manufacturing . . .	USDIA	80,951	13,174	2,369	15,264	8,251	14,307
	FDIUS	69,112	4,986	448	62,934	577	(991)
Computers and electronic products	USDIA	23,864	616	998	3,026	2,328	9,016
	FDIUS	13,807	(9)	580	13,821		(816)
Transport equipment	USDIA	7,565	1,840	31	758	696	7,822
	FDIUS		(31)		26,363		8
Wholesale trade	USDIA	26,369	2,532	6,643	8,024	1,144	1,886
	FDIUS	86,473	1,722	1,009	76,732	4,539	425
Finance and insurance	USDIA	65,651	6,455	10,134	34,032	1,949	
	FDIUS	18,177	2,447		14,119	144	
Holding companies	USDIA	122,683	77,339	11,634	1,253	312	
	FDIUS						

Source: USDOC, BEA.
Note: Empty cells imply no data are available.

Manufacturing is the other large industry component of the U.S. inbound and outbound FDI relationship with the Asia-Pacific region. U.S. investors held USDIA stock of $81.0 billion in Asian-Pacific manufacturing firms in 2005,including $23.9 billion in affiliates involved in the manufacture of computers and electronic products. Figure 6 shows the regional breakdown of USDIA in the industry. U.S. investors also held a $15.1 billion position in the Asia-Pacific chemicals industry, split among a large number of Asian countries. New USDIA capital outflows to the region were $13.0 billion during 2005, primarily to the finance and insurance and manufacturing industries in Japan. The stock of FDIUS in manufacturing from the Asia-Pacific region was $69.1 billion in 2005, with the largest amounts in transportation equipment and computers and electronic products.[12] FDIUS in wholesale trade from the Asia-

[12] Data for 2005 for FDIUS in transportation equipment from the Asia-Pacific region were suppressed by BEA to avoid disclosure of individual company information, along with individual country data for China and South Korea. FDIUS from Japan in transportation equipment was $26.4 billion in 2005. In 2004, however, the Asia-Pacific FDIUS position in transportation equipment was $26.5 billion, almost all of which consisted of investment by Japanese firms.

Figure 6 Asia–Pacific region, USDIA position in computers and electronics manufacturing, 2005 (percentage)



Source: USDOC, BEA.

Pacific region was valued at $86.5 billion in 2005, 89 percent of which came from Japan, and 5 percent from South Korea. USDIA in Asia-Pacific financial services was $80.7 billion in 2005, of which $15.0 billion was depository institutions.

NAFTA

Canada and Mexico rank second and 12th, respectively, as FDI partners with the United States (see table 2). As a region, the two countries combined rank just behind the Asia-Pacific region, with 15 percent of USDIA ($306.3 billion) and 9 percent of FDIUS overall. For outbound U.S. investment, the largest share goes to manufacturing with a total of $105.4 billion, with the chemicals and transport equipment segments each accounting for just under $18 billion (figure 7). USDIA in finance and insurance was $51.2 billion, followed by mining investment, at $35.8 billion. For FDIUS, the largest share was again represented by financial services ($60.2 billion), most of which came from Canada, followed by manufacturing, at $31.8 billion.[13]

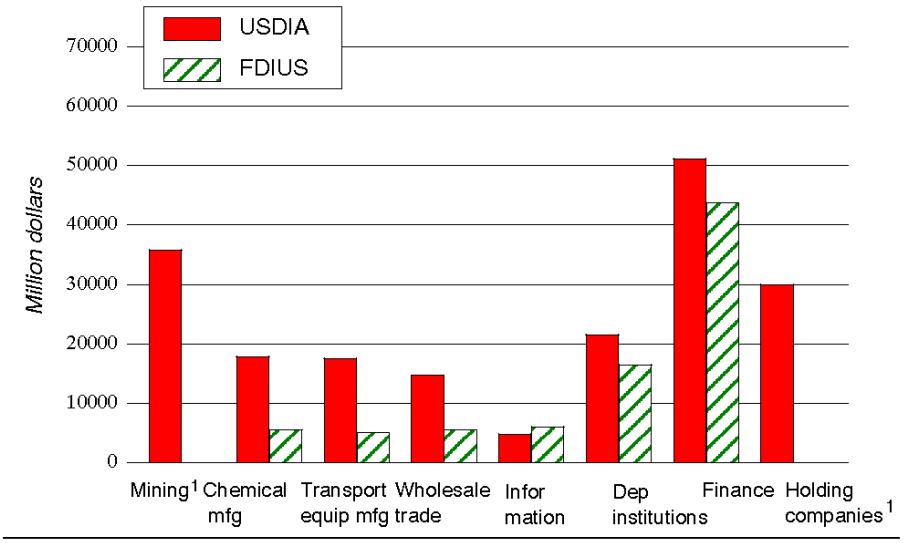
Latin America and the Caribbean[14]

Latin America and the Caribbean accounted for 14 percent of USDIA in 2005 ($281.6 billion), compared with 5 percent of FDIUS ($73.9 billion).The largest industries for USDIA were holding companies and finance and insurance (excluding depository institutions) with $117.7 billion and $98.6 billion,

[13] Data for FDIUS position are not available for the mining industry.
[14] Excludes Mexico.

respectively, with most investment in the British Islands in the Caribbean and Bermuda. Both countries are centers for holding companies, with a large share of the capital likely destined for operating companies in a variety of industries USDIA capital flows to Latin America and the Caribbean were largest in finance

Figure 7 USDIA and FDIUS position, NAFTA, 2005



Source: USDOC, BEA.

[1] FDIUS data for mining and holding companies specific to the NAFTA countries are not available.

and insurance in 2005, with $9.2 billion. Other leading industries were wholesale trade and mining. By industry, the largest recipients of FDIUS from the region are manufacturing ($20.7 billion), followed by finance and insurance ($15.2 billion), and wholesale trade ($9.5 billion). Panama and Venezuela are the largest sources of FDIUS, with stock of $11.5 billion and $6.7 billion, respectively.[15]

Africa and the Middle East

Africa and the Middle East account for the smallest shares of both USDIA and FDIUS stick with 2 percent and 1 percent, respectively. For USDIA, the largest industry is mining, which includes the petroleum industry (table 8). In 2005,

[15] Details regarding the industry distribution of FDIUS from Panama and Venezuela are not available.

U.S. investors held stock in mining companies valued at $5.6 billion in the Middle East and $15.3 billion in Africa. U.S. investors also held $7.9 billion in manufacturing FDI in the region, over one-half of which was invested in Israel, primarily in the computers and electronics industry.

Total stock of FDIUS from the region was $12.5 billion in 2005. Of that total, $4.4 billion of this originated in Israel, with the largest shares in the depository institutions and information industries. Much of the remainder is most likely from Saudi Arabia and the United Arab Emirates, but precise data are not available.[16] Prince al-Waleed bin Talal, through his company, Kingdom Holdings Co., reportedly controls a $10 billion-equity share of Citibank, making him the largest shareholder in the U.S. financial services company. KingdomHoldings also acquired a $450 million equity stake in Time Warner in 2002 and controls an equity stake of more than 5 percent in Priceline [Bureau van Dijk (Zephyr)].

Largest Country Investment Partners

United Kingdom

The United Kingdom is the both largest source of FDIUS and the largest destination for USDIA (figure 8). British investors accounted for 16 percent of total USDIA stock in 2005 and 17 percent of FDIUS stock, illustrating the close economic relationship between the two countries. Inbound and outbound FDI are concentrated in different industries, as illustrated in table 9. Financial services accounts for the largest share of USDIA in the United Kingdom, consistent with the central role of London's financial markets in the global financial system. By contrast, a greater share of FDIUS from the United Kingdom is invested in the manufacturing and wholesale trade industries. Combined capital inflows during the years 2000-2005 generally reflect the same industry breakdown as FDIUS stock from the United Kingdom, implying that recent British investment in the United States remains focused on the same industries as it has been historically.

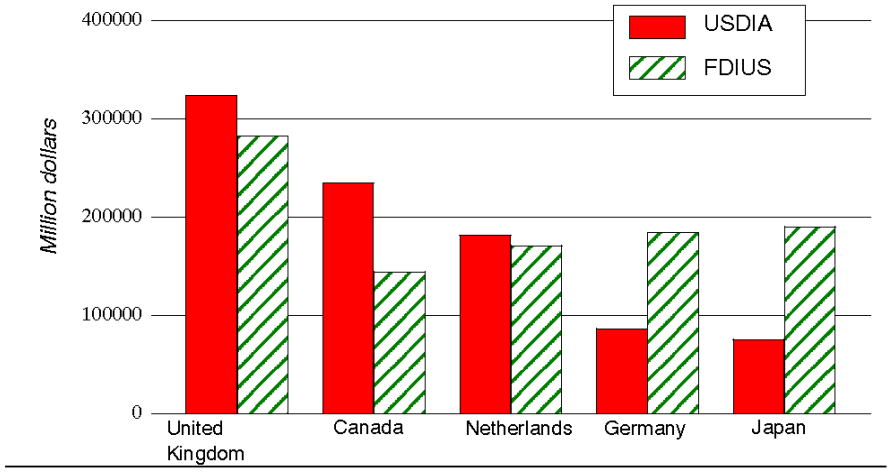
[16] BEA suppressed the data to avoid disclosing information pertaining to individual company transactions.

TABLE 8 Africa and the Middle East, USDIA position and FDIUS position, selected industries, 2005

Country/ Region		Manufac-turing	Wholesale trade	Information	Finance and insurance	Professional, scientific, and technical services	Mining	Holding companies
Africa and Middle East	USDIA	7,863	1,724	1,976	1,491	1,155	20,922	7,015
	FDIUS	1,603	0	809	0	0	0	0
Egypt	USDIA	218	55		13	3	4,085	0
	FDIUS							
South Africa	USDIA	1,610	437	147	61	114	(5)	
	FDIUS	(3)						
Israel	USDIA	4,259	795	1,766	291	455		
	FDIUS	847	427	803	(2)			
Saudi Arabia	USDIA	419	276	15	(49)	33		2,425
	FDIUS							
UAE	USDIA	1,064	(346)	12	666	34	1,064	487
	FDIUS	(15)						

Source: USDOC, BEA
Note: Empty cells imply no data are available.

Figure 8 USDIA and FDIUS position, leading countries, 2005



Source: USDOC, BEA.

TABLE 9 USDIA and FDIUS position and capital flows in the United Kingdom, by industry, 2005 (million dollars)

	FDI position at historical cost, 2005		Combined capital flows, 2000-2005	
Industry	USDIA	FDIUS	USDIA	FDIUS
All industries	323,796	282,457	145,601	234,333
Manufacturing	60,355	76,792	23,383	34,205
Chemicals	13,136	29,714	(1,727)	(711)
Computer	5,815	12,378	2,007	12,507
Transport equipment	6,063	6,558	1,001	6,596
Wholesale trade	13,963	62,392	6,373	35,027
Information	6,937	17,918	6,959	71,044
Depository institutions	17,018	[a]	563	7,789
Finance and insurance	85,474	[a]	36,397	26,266
Professional, scientific, and technical service	9,863	18,052	4,270	20,526
Holding companies	78,467			
Other	51,719	107,303 [b]	66,375	21,084

Source: USDOC, BEA.
Note: Empty cells imply no data are available.
[a] Data suppressed to avoid disclosure of individual company information.
[b] Includes finance and insurance, depository institutions, holding companies, and all other industries. Detailed information on the financial service industries was suppressed by BEA for 2004 and 2005 to avoid the disclosure of individual company information. BEA does not provide separate data on holding companies for inbound U.S. investment, but such FDI is believed to be significantly smaller than for outbound U.S. investment.

Finance, insurance, and depository institutions together accounted for almost one-third of the total USDIA position in the United Kingdom in 2005. The share of depository institutions stayed stable during the period, at 6 to 7 percent. By contrast, USDIA in the British finance and insurance industries has steadily increased from 17 percent in 2000 to 26 percent in 2005, an increase of $45.3 billion during the period. Table 10 presents the leading U.S.-owned companies in the U.S. financial service sector, by annual operating revenue.

Data for the FDIUS position in financial services from the United Kingdom were suppressed for 2004 and 2005, but in 2003, the industries together accounted for 13 percent of British FDIUS. There were at least 39 U.S. acquisitions by British -based financial services firms between 2000 and 2005. The 29 transactions with reported deal values were together valued at $20.1 billion, with the acquisition of credit card services firm Household International by global banking giant HSBC Holdings valued at $14.2 billion [Bureau van Dijk (Zephyr)].

Manufacturing accounted for 19 percent of the total USDIA position in the United Kingdom in 2005, a share which remained fairly stable between 2000 and 2005. U.S. investment in the British manufacturing sector is largest in the chemicals industry, with the USDIA position reaching $13.1 billion in chemicals manufacturing in 2005. As of September 2006, at least 277 British chemicals affiliates of U.S. parents produced pharmaceuticals, petrochemicals, and other chemicals.

British investment in the United States is largest in the manufacturing sector, (27 percent), 40 percent of which ($29.7 billion) is chemicals. As of September 2006, at least 49 U.S. chemicals firms were British owned. British FDIUS stock in computer manufacturing was valued at $12.4 billion in 2005. Professional, scientific and technical services ($18.1 billion) and information services ($17.9 billion) are also important destinations for FDIUS from the United Kingdom (table 11).

Cross-border M&A is an important source of FDI between the United States and the United Kingdom. Between 2000 and 2005, there were at least 856 acquisitions of British firms by U.S. parents, and 477 acquisitions of U.S. companies by British parents [Bureau van Dijk (Zephyr)]. The largest acquisitions, by reported deal value, are listed in table 12.

TABLE 10 Selected British financial services affiliates of U.S. parent firms, by operating revenue, 2006

Company name	Business description	Number of employees	Operating revenue (million dollars)	Parent firm
Threadneedle Investment Services	Depository Credit Intermediation	44	10,609	American Express Co.
Merrill Lynch Fund Managers	Depository Credit Intermediation		8,950	Merrill Lynch & Co., Inc.
Goldman Sachs International	Depository Credit Intermediation	3,578	4,880	Goldman Sachs Group, Inc
Morgan Stanley & Co. International	Securities and Commodity Contracts Intermediation and Brokerage	193	3,991	Morgan Stanley
Merrill Lynch International	Non-Depository Credit Intermediation	1,950	3,232	Merrill Lynch & Co., Inc.
Citigroup Global Markets	Securities and Commodity Contracts Intermediation and Brokerage	3,756	2,787	Citigroup Inc
Citigroup Global Markets Europe	Depository Credit Intermediation	3,163	2,532	Citigroup Inc
Marsh & McLennan Companies UK	Agencies, Brokerages and Other Insurance Related Activities	10,372	2,141	Marsh & McLennan Companies Inc.
Lehman Brothers International (Europe)	Securities and Commodity Contracts Intermediation and Brokerage		1,454	Lehman Brothers Holdings Inc.
GE Keynes Holdings	Insurance Carriers		1,401	General Electric Company

Source: Bureau van Dijk (Orbis).
Note: Operating revenue and number of employees reflect latest reported year for each company.
Note: Empty cells imply no data are available.

TABLE 11 U.S. manufacturing affiliates of British parent firms, 2006

Company name	Business description	Number of employees	Annual operating revenue (million dollars)	Parent company
Shell Petroleum	Petroleum and Coal Products	26,880	16,295	Royal Dutch Shell Plc
Chevron Phillips Chemical Co.	Rubber and plastics manufacturing	5,500	11,038	Ineos Group Limited
Equilon Enterprises	Petroleum and Coal Products	8,600	5,206	Royal Dutch Shell Plc
Glaxosmithkline	Pharmaceutical and Medicine	24,036	3,095	Glaxosmithkline Plc
BAE Systems	Aerospace Product and Parts	32,328	2,736	Bae Systems Plc
Diageo North America	Beverages	8,000	2,667	Diageo Plc
United Defense Industries	Other Transportation Equipment	7,700	2,292	BAE Systems Plc
ICI American Holdings	Paint, Coating, Adhesive, and Sealant	14,800	2,279	Imperial Chemical Industries Plc
Rexam	Boiler, Tank, and Shipping Containers	3,483	1,902	Rexam Plc
Invensys	Navigational, Measuring, Medical, and Control Instruments	8,000	1,700	Invensys Plc

Source: Bureau van Dijk (Orbis).
Note: Operating revenue and number of employees reflect latest reported year for each company.

For inbound British M&A, the largest industry category by deal value was food and tobacco manufacturing, which accounted for the top four British acquisitions,[17] followed by financial services, and chemicals, petroleum, and plastics manufacturing. The most active industry was personal and business services, with 142 deals during the period valued at $8.9 billion.[18]

[17] Unilever's $24.4 billion acquisition of Bestfoods and $2.3 billion acquisition of Slim-Fast Foods, both in 2000, South African Breweries' acquisition of Miller Breweries for $5.6 billion in 2002, and Cadbury Schweppes' acquisition of Snapple Beverages for $1.5 billion, also in 2000. Bureau van Dijk (Zephyr).

[18] Only 89 of the deals had values reported, but it is likely that most large acquisitions involving public companies had reported deal values.

TABLE 12 Selected cross-border acquisitions by U.S. and British firms, by reported deal value, 2000-2005 (billion dollars)

Acquiring company name	Target name	Deal value (million dollars)	Date completed	Industry/details
U.S. acquisitions of British firms				
NTL, Inc.	Cable & Wireless Communications, Ltd.	11,512.3	May 2000	Cable television and telecommunications services
General Electric Company	Amersham plc	10,449.1	April 2004	Pharmaceuticals
Carnival Corp.	P&O Princess Cruises	7,877.9	May 2003	Cruise lines
Chase Manhattan Bank	Robert Fleming Holdings Ltd.	7,667.4	August 2000	Banking services
United Global Communications, Inc.	Telewest Communications plc	5,300.0	June 2000	Cable television and telecommunication services
British acquisitions of U.S. firms				
BP Amoco	Atlantic Richfield Co.	27,407.3	April 2000	Oil exploration and production
Unilever Group	Bestfoods	24,400.0	June 2000	Food manufacturer
HSBC Holdings plc	Household International, Inc.	14,200.0	March 2003	Banking services
Ineos	Innovene Inc.	9,000.0	December 2005	Petrochemical services
National Grid Group plc	Niagara Mohawk Holdings, Inc.	8,900.0	January 2002	Utility

Source: Bureau van Dijk (Zephyr).

Canada

Canada was the second-largest U.S. investment partner during 2005. In 2004, USDIA stock in Canada accounted for 11 percent of the U.S. total, with Canada holding 9 percent of FDIUS stock. Canada is also the largest U.S. trading partner. Trade and investment across the border and elsewhere are closely linked, as MNCs around the world expand their supply chains and assembly operations across borders. The manufacturing, finance and insurance, and mining sectors account for the greatest shares of U.S. outbound stock in Canada (table 13).[19]

[19] For more information on U.S. investment in the mining sector, see US ITC 2006.

TABLE 13 USDIA: Direct investment position in Canada, selected industries, 2000 and 2005

Industry	2000		2005	
	Million dollars	Percent of total	Million dollars	Percent of total
Mining	13,629	10.3	33,718	14.4
Manufacturing	53,380	40.3	86,013	36.6
Chemicals	8,070	6.1	14,164	6.0
Transportation equipment	13,282	10.0	17,555	7.5
Wholesale trade	9,100	6.9	12,663	5.4
Depository institutions	2,059	1.6	3,923	1.7
Finance and insurance	26,262	19.8	37,860	16.1
Information services			3,809	1.6
Holding companies			23,705	10.1
All industries	132,472		234,831	

Source: USDOC, BEA.
Note: Empty cells imply no data are available.

In manufacturing, the largest shares were in the transport, equipment, and chemicals industries. More than 100 U.S.-owned firms operate in the Canadian transport equipment industry, including General Motors, Flex-N-Gate, Dana Corp., Boeing and Navistar. These U.S. subsidiaries manufacture automobile, aircraft, or truck parts, which primarily are shipped back to the United States for final assembly into vehicles. Both proximity and the NAFTA encourage such investment.

Cross-border FDI in the chemicals industry also benefits from the infrastructure established between the United States and Canada (and also Mexico). Initial processing of many chemicals is performed in either Canada or Mexico, and then transferred across the borders to U.S. manufacturing facilities for final processing into end products (USITC 2006, chapter 7). Canada has historically been a primary destination for U.S. investment in part due to the highly developed infrastructure (i.e., pipelines, highways, and ports) between the two countries and in part to Canada's abundant supplies of raw materials, particularly natural gas and crude petroleum. In one particularly large transaction in July 2003, U.S.-based Dupont paid $1.1 billion to acquire the 26 percent equity share in Dupont Canada that it did not already control. In smaller acquisitions of Canadian companies by U.S. chemicals firms, in March and April 2004, Bayer Crop Science acquired the remaining 50 percent stake in

Gustafson to become the sole owner, at a price of $124 million[20] [Bureau van Dijk (Zephyr)], and United Industries Corporation acquired Nu-Gro Corp. for $140 million. In all, U.S. firms acquired 52 Canadian chemical companies during 1999-2004 [Bureau van Dijk (Zephyr)]. Large, recent acquisitions of U.S. chemicals firms by Canadian parents include the acquisition of Atrix Labs by QLT, Inc., for $855 million in November 2004, Superior Propane's acquisition of Sterling Chemicals' pulp business for $375 million in December 2002, and Agrium Inc.'s acquisition of Unocal Corp. agricultural products unit for $321 million in September 2000 [Bureau van Dijk (Zephyr)].

The rise in U.S. outbound stock in Canada's mining sector reflects several new equity transactions during 1999-2001, and the reinvestment of earnings resulting from higher metal prices in 2003-04 (USITC 2006). Notable transactions include the Newmont Mining Co. acquisition of several Canadian gold interests (Newmont 2006), Aber Diamond Corp. 40 percent joint venture development of the Diavik Diamond Mine, which started producing in 2002 (Diavik 2000; Geological Survey 2005), Inco's development of the Voisey's Bay nickel properties, and several other companies' iron ore mining ownership and development transactions Geological Survey 2005). Canadian investors are also interested in the U.S. mining sector. In August 2006, Canada's Goldcorp announced plans to acquire Glamis Gold of Nevada for $8.6 billion through an exchange of shares, in a move that would create one of the largest gold mining companies in the world. The acquisition is expected to be completed in November 2006 (Glamis 2006).

The main industry destinations for Canadian investment in the United States are financial services and manufacturing. Within financial services, the largest recent transaction was Manulife Financial Corp.'s acquisition of U.S.-based John Hancock Financial Services, both of which are insurance and financial service advisory firms. The acquisition was valued at $10.4 billion, and closed in April of 2004. In terms of value, the next largest acquisition was Toronto Dominion Bank's acquisition of a 51 percent stake in U.S.-based Banknorth, valued at $3.8 billion in March 2005. Royal Bank of Canada acquired five separate U.S. financial services firms during 1999-2005, for a combined value of $3.9 billion. The larger Canadian banks and insurance companies have become more interested in accessing the U.S. market in recent years, as several of them have outgrown their home market. Canadian banks in particular have not been permitted to merge domestically, due to Canadian regulators' antitrust concerns, so some have responded by pursuing cross-border acquisitions (KPMG 2006).

[20] Bayer Crop Science acquired its original 50 percent stake in Gustafson in 1998.

Canadian parents also acquired 285 U.S. manufacturing firms between 2000-2005.[21] Within the manufacturing sector, the largest share in terms of both numbers of transactions and total value was industrial and electric machinery, with 108 deals, and a combined recorded value of $28.2 billion for the 59 deals with values recorded. Other U.S. manufacturing industries with significant Canadian FDI in recent years were chemicals (36 acquisitions), biotech and pharmaceuticals (25 acquisitions), food and tobacco (26 acquisitions), and wood and furniture manufacturing (25 acquisitions) [Bureau van Dijk (Zephyr)].

Netherlands

The Netherlands ranks third in terms of combined USDIA and FDIUS position. Holding companies, manufacturing, and financial services are the largest destinations for USDIA position, compared with finance and chemicals manufacturing for FDIUS position. Finance and insurance was the largest industry destination for new U.S. capital inflows from the Netherlands between 2000 and 2005, followed by manufacturing (machinery in particular), and wholesale trade (table 14).

In the Netherlands, holding companies accounted for $95.1 billion, or 52 percent of the USDIA position in 2005. Manufacturing ranked second, followed by finance and insurance (figure 9). Chemicals and food manufacturing accounted for two-thirds of total USDIA in Dutch manufacturing. U.S. parents with chemicals subsidiaries in the Netherlands included Merck & Co.,Wyeth, Dow Chemical, and ExxonMobil, with reported annual operating revenues of $4.1 billion, $3.6 billion, $2.7 billion, and $2.7 billion, respectively.[22] Food and beverage manufacturing, which includes tobacco, is a big area for U.S. companies. Altria Group's Philip Morris Holland subsidiary employed over 12,000 people and reported operating revenue of $7.0 billion in 2004. Sara Lee lists five Dutch subsidiaries with close to 50,000 employees and almost $7 billion in combined revenue. Mars, Inc., Cargill, Coca-Cola, Heinz, and Pepsico all have subsidiaries in the Netherlands [Bureau van Dijk (Orbis)].

Reflecting the fact that the Netherlands is a fairly small market for banks and insurance companies, the largest U.S. financial services firms, as measured by operating revenue, are the finance arms of the manufacturing firms that have invested in the Netherlands. Holding companies also tend to be listed

[21] Deal values were recorded for 138 deals (49 percent), for a total recorded value of $36.1 billion.

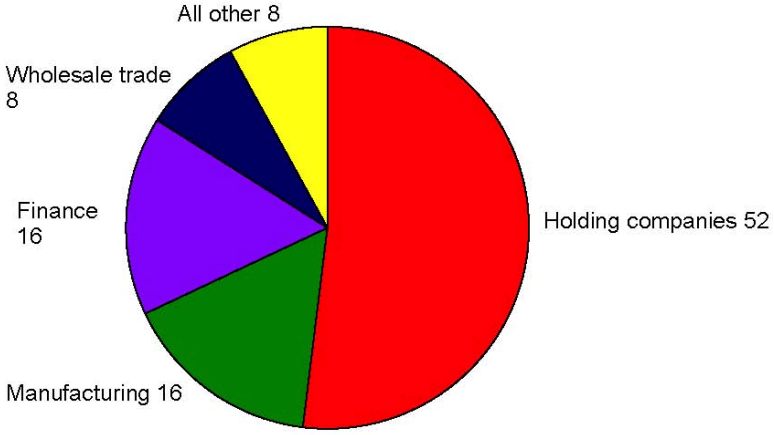
[22] Operating revenues reflect latest available year: 2005 for Merck, 2004 for Wyeth, Dow Chemical, and Exxon Mobil. Bureau van Dijk (Orbis).

TABLE 14 USDIA and FDIUS position and capital flows in the Netherlands, by selected industry

Industry	FDI position at historical cost, 2005		Combined Capital Flows 2000-2005	
	USDIA	FDIUS	USDIA	FDIUS
All industries	181,384	170,770	28,585	86,173
Mfg	29,508	72,459	13,173	38,318
Food	9,011	NA	3,137	(287)
Chemicals	10,583	25,024	6,025	14,633
Machinery				
Computer	1,242	8,322	485	1,524
Transport equip	1,900	6,147	1,956	217
Wholesale trade	14,152	9,691	4,239	201
Information	4,385	12,283	350	(1,088)
Finance	28,695	40,847	8,213	27,743
Prof, sci, tech	2,388	8,611	1,232	6,971
Holding companies	95,071		(24,361)	

Source: USDOC, BEA.
Note: Empty cells imply no data are available.

Figure 9 USDIA in the Netherlands, 2005 (percentage)



Source: USDOC, BEA.

within the finance industry, even when their purpose is not credit intermediation. Many U.S.-owned manufacturing firms have established affiliates in the Netherlands to take advantage of the port of Rotterdam, and Rotterdam's extensive facilities for merchandise distribution throughout Europe. Presented by operating revenue, the largest U.S. finance subsidiaries in the Netherlands are IBM International Finance NV, Google Netherlands Holdings BV, MWH Holding BV (architectural and engineering services), Avery Dennison Holding and Finance (maker of office products, including labels), and GE Plastics ABS Europe BV.

Dutch investors have a significant presence in the U.S. market (table 15). As of 2006, there were at least 40 Netherlands-owned companies in the United States engaged in such services, many of which were controlled by Koninklijke Philips Electronics NV, the parent company of Philips Electronics, which is primarily engaged in the manufacturing and distribution of electronic goods. Philips' affiliates Medquist, Navteq, Stentor, and A-Life Medical are all involved in professional services, primarily computer-related services. Arcadis NV and Exact Holding NV are Dutch-owned companies involved in architectural, engineering, and computer-related services. Combined capital inflows to U.S. professional, scientific, and technical services industries were $7.0 billion between 2000 and 2005.

TABLE 15 Selected Netherlands-based parent firms with U.S. affiliates, 2006

Parent company	Number of US affiliates	U.S. operating revenue (million dollars)	US employees	Primary business
Koninklijke Ahold NV	36	56,241	400,231	Grocery stores
Aegon NV	67	42,077	50,443	Insurance
ING Groep NV	37	28,513	20,532	Financial services
Koninklijke Philips NV	30	15,873	47,492	Machinery and equipment manufacturing
Akzo Nobel NV	19	4,534	17,682	Chemicals and pharmaceuticals manufacturing
Buhrmann NV	8	3,898	28,100	Office products and business support services
Hagemeyer NV	8	1,923	7,800	Wholesale distribution services
OCE NV	8	1,211	12,477	Manufacturing and distribution of professional equipment
Chicago Bridge and Iron Co. NV	6	829	8,713	Construction and engineering services
Koninklijke Wessanen NV	5	773	3,951	Grocery wholesalers
Vedior NV	6	613	10,005	Employment services
Core Laboratories NV	7	588	5,199	Mining services
Exact Holding NV	4	541	413	Computer systems design services
Arcadis NV	7	320	4,000	Architectural and engineering services

Source: Bureau van Dijk (Orbis).

Note: Operating revenue and employees not reported for all affiliates. The table reflects all reported data.

Netherlands-based investment in the U.S. chemicals industry is dominated by Akzo Nobel NV, which ranked 418 on the Fortune magazine Global 500 list in 2006. The company reported global revenues of $16.2 billion in 2005, and was ranked ninth out of the top 10 global chemical companies (Fortune 2006). Of the 24 U.S. chemical companies identified as having Dutch parents, 13 are affiliates of Akzo Nobel, including eight of the top 10 by operating revenue.

Together, the Akzo Nobel affiliates in the United States employed more than 17,000 people, and reported operating revenues of $4.5 billion.[23]

Dutch banks and insurance firms also have a strong presence in the U.S. market. As is the case for many Canadian financial firms, they have outgrown their domestic market, and seek additional opportunities in the United States. Two leading Dutch-owned financial firms, ING Groep NV and Aegon NV, have established extensive affiliate holdings in the United States. The two are ranked 13 and 149 by the Fortune Global 100 List, with global operating revenues of $138.4 billion and $37.7 billion, respectively, in 2005 (Fortune 2006). Aegon's entry into the U.S. market was facilitated by its 1999 acquisition of Transamerica Finance Corp. [Bureau van Dijk (Zephyr)],[24] but has grown to include 67 affiliates in the United States, primarily involved in the insurance industry. ING holds 37 separate U.S. affiliates, predominantly insurance and securities firms [Bureau van Dijk (Orbis)].

Germany

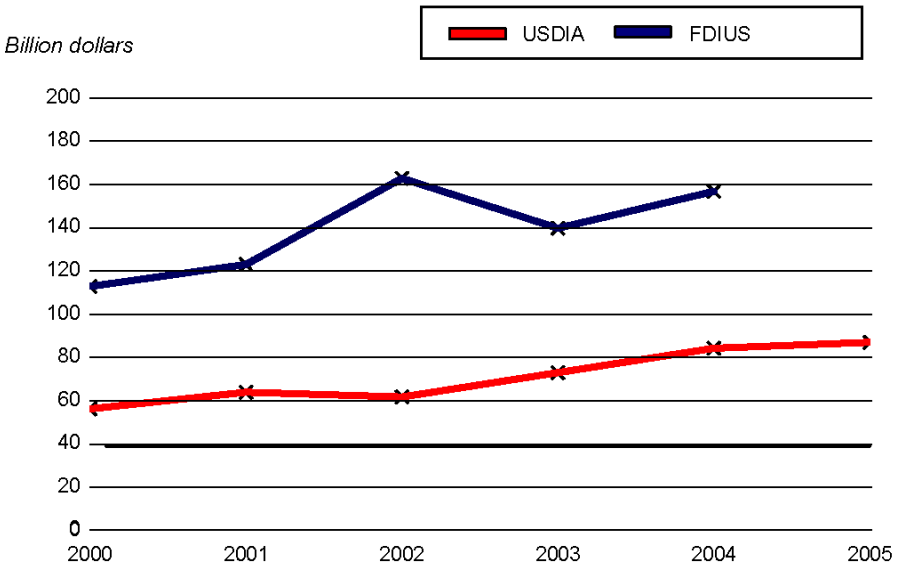
In contrast with the United Kingdom, Canada, and the Netherlands, German FDI in the United States is substantially larger than USDIA in Germany (figure 10). The USDIA position in Germany was valued at $86.3 billion in 2005 (4 percent of total USDIA) compared with German direct investment in the United States of $184.2 billion (11 percent of total FDIUS). The manufacturing sector represents the largest share of German FDIUS, with $70.9 billion, primarily in chemicals and transportation equipment. Well-known, German-based companies in the United States include chemical companies Bayer and BASF, and automobile companies including Daimler-Chrysler, Volkswagen, and BMW. Finance and insurance ($18.4 billion) and banks ($16.4 billion) also represent large share of total German investment in this country, with substantial investment from German-based Allianz, an insurance firm, and Deutsche Bank, both world leaders in their industries. Substantial German investment in the U.S. information industries is dominated by Deutsche Telekom, which primarily operates through its T-Mobile and T-Systems affiliates in the United States [Deutsche Telekom 2006; Bureau van Dijk (Orbis)].

German firms completed at least 239 acquisitions of U.S. companies between 2000 and 2005 [Bureau van Dijk (Zephyr)]. The largest shares, classified by the number of transactions, were in industrial and electric machinery, computer

[23] Latest available year for reporting was 2005 for four affiliates, including the top three, 2004 for six affiliates, and 2003 for three affiliates. Two affiliates did not report operating revenues.

[24] The acquisition, valued at $9.8 billion, was completed in July 1999. Bureau van Dijk (Zephyr).

Figure 10
Inbound and outbound FDI position in Germany, 2000-2005



Source: USDOC, BEA.
Note: 2005 FDIUS data not available.

and internet services, and personal and business services.[25] Even though the communications industry accounted for less than 3 percent of all German acquisitions, the single largest acquisition by a German company during the period was Deutsche Telekom's acquisition of VoiceStream Wireless Corp., concluded in June 2001 for $29.6 billion. More recently, large acquisitions included the RWE takeover of American Water Works in January 2003, for $8.6 billion, one of 18 acquisitions by the giant utility firm during the period, but the only one in the United States. Bayer acquired Roche Consumer Health in January 2005 for $3.1 billion. Roche is a Swiss firm, but the transaction included Bayer's substantial U.S. holdings. Bayer acquired an additional three U.S. companies during the period: yet2com.inc, an online marketer of intellectual property; Cytec Industries, a maker of chemicals used in the manufacture of paper; and the Lyondell Chemical Co. polyols business. Together, the three

[25] Reflects the industry of the target firm, which is consistent with official U.S. direct investment statistics from the Bureau of Economic Analysis. These industry shares may not reflect the industry breakdowns of FDIUS position data cited above, because those data are cumulative, and may reflect older investments supplemented over time by reinvested earnings or other income sources. For instance, new German acquisitions of U.S. transportation equipment firms accounted for only 3 percent of total German acquisitions in the United States, even though transportation equipment accounted for 13 percent of total FDIUS stock from Germany. The M&A data for the most recent period, combined with the recent annual capital flows data, reflects the most recent investment trends.

deals, all completed during 2000 and 2001, were valued at approximately $2.6 billion. As of 2006, Bayer controlled eight U.S. affiliates, with combined operating revenue of $5.8 million and 30,250 employees.[26] Another German chemicals firm, Henkel KGaA, acquired U.S.-based Dial Corp. for $2.9 billion in March 2004. Henkel controls 29 U.S. affiliates, including Clorox Co. and Glad Products Co., in addition to Dial [Bureau van Dijk (Zephyr, Orbis)].

German firms also have a strong presence in the U.S. financial services market. Deutsche Bank has acquired three U.S. firms since 2000: Zurich Scudder Investments for $2.5 billion April 2002, National Discount Brokers Group, and RoPro US Holding. As of 2006, Deutsche Bank held an equity stake of at least 10 percent in 50 U.S. subsidiaries, operating primarily but not exclusively in the financial service industries.[27] Similarly, German insurance giant Allianz AG acquired Pimco Advisors and Nicholas-Applegate Capital Management during the 2000-2005 period, two new additions to its list of 37 U.S. subsidiaries, including its self-named Allianz Life Insurance Co. of North America, Fireman's Fund Insurance, and Oppenheimer Capital, a mutual fund company [Bureau van Dijk (Zehyr, Orbis)].

USDIA in Germany is largest in manufacturing ($22.2 billion), particularly transportation equipment ($4.6 billion), computers and electronic products ($4.1 billion), and chemicals ($4.1 billion). Wholesale trade and financial services, with USDIA stock of $19.0 billion and $13.6 billion, respectively, are also important destinations for USDIA in Germany. The largest number of acquisitions by U.S. firms in Germany since 2000 has been in computer and internet services; personal and business services; and industrial and electric machinery. By deal value, however, the largest industry was chemicals, petroleum, and plastics manufacturing, driven particularly by Proctor & Gamble's two-part acquisition of Wella AG, valued at approximately $9 billion for P&G's final stake of 79 percent of the company. Total reported deal value in the chemicals manufacturing industry was $21.4 billion, compared with $6.1 billion and $4.0 billion, respectively, for personal and business services, and computer and internet services.[28]

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[26] Reflects 2004 data for two smaller affiliates: H.C. Starck Inc. and Nunhems USA Inc.; 2005 data for all other affiliates.

[27] Other industries include wholesale trade, travel and tourism, business services, and pharmaceuticals manufacturing [Bureau van Dijk (Zephyr and Orbis)].

[28] Deal values are not reported for many acquisitions, particularly those that do not involve publicly listed companies, so the data on deal value are incomplete. However, it is likely that deal values are reported for the largest deals involving public companies. For this discussion of U.S. acquisitions in Germany during the years 2000-2005, values were reported for 49 percent of chemicals, 48 percent of personal and business services, and 42 percent of computer and internet services transactions [Bureau van Dijk (Zephyr)].

Japan

Like Germany, the largest share of the U.S. FDI relationship with Japan is inbound to the United States, with FDIUS valued at $190.3 billion in 2005, and USDIA valued at a comparatively smaller $75.5 billion. This reflects in part the historic difficulty that U.S. firms have faced in penetrating the Japanese market in a variety of industries, and in part the strong Japanese interest in the U.S. market. Japanese FDIUS is particularly strong in the wholesale trade and manufacturing industries, with the largest manufacturing subsectors being transportation equipment and computers and electronic products. Japanese wholesale trade companies are involved in a variety of industries, including automobiles, metals, apparel, auto parts, agricultural goods, and office equipment (table 16).

TABLE 16 Leading Japanese-owned wholesale trade companies, by U.S. operating revenue, 2006

US company	Parent company	US employees	Annual operating revenue ($1,000)	Industry
American Honda Motor Co.	Honda Motor Co.	26,000	7,680,900	Automobiles
Mitsubishi International Corp.	Mitsubishi Corp.	752	6,345,738	Metals and metal ores
Mitsui & Co. (USA)	Mitsui & Co.	1,800	5,680,758	Metals and coal
Itochu International	Itochu Corp.	4,521	3,434,087	Textiles and apparel
TAP Pharmaceutical Products	Takeda Pharmaceutical Co.	3,118	3,361,634	Pharmaceutical drugs and sundries
Toyota Motor Sales USA	Toyota Motor Corp.	8,900	2,627,600	Automobiles

Source: Bureau van Dijk (Orbis).
Note: Operating revenue and number of employees reflect latest reported year for each company.

By far the largest share of USDIA in Japan (45 percent) was invested in finance and insurance services, valued at $34.0 billion in 2005.[29] Many U.S.-based securities and insurance firms have operations in Japan, with substantial operating revenues (table 17) [Bureau van Dijk (Zephyr)]. By comparison, USDIA stock in the Japanese manufacturing sector was valued at $15.3 billion

[29] This does not include depository institutions, which accounted for only $156 million in USDIA position.

in 2005, with the chemicals and computers and electronic products industries, each with over $3 billion. Wholesale trade and professional, scientific, and technical services were also significant destinations for U.S. direct investment in Japan, with $8.0 billion and $7.6 billion in USDIA stock, respectively. In the latter category, there were at least 33 acquisitions of Japanese companies by U.S. investors, involving industries such as financial services, management consulting, software development, and medical research [Bureau van Dijk (Zephyr)].

TABLE 17 Leading U.S. financial services affiliates in Japan, by annual operating revenue, 2006

Company name	Primary activity	Annual operating revenue (million dollars)	U.S. parent company
Hartford Life Insurance	Insurance Carriers	11,758	Hartford Financial Services Group Inc
Gibraltar Life Insurance Co Ltd	Insurance Carriers	3,529	Prudential Financial
Prudential Life Insurance Co	Insurance Carriers	3,373	Prudential Financial
AIG Star Life Insurance Co	Insurance Carriers	2,767	American International Group
Nikko Citigroup	Non-Depository Credit Intermediation	1,080	Citigroup
Merrill Lynch Japan Securities Co.	Securities and Commodity Contracts	782	Merrill Lynch & Co.
JP Morgan Securities Asia	Securities and Commodity Contracts	581	JP Morgan Chase & Co.

Source: Bureau van Dijk (Orbis).
Note: Operating revenue and number of employees reflect latest reported year for each company.

Between 2000 and 2005, industrial and electric machinery accounted for the greatest number of Japanese acquisitions in the United States, with 28 transactions, followed by personal & business services and computer & internet services, with 13 and 15, respectively. By value, the largest industry for inbound Japanese M&A was communications, with $13.4 billion. This represents only

three deals,[30] including NTT DoCoMo's January 2001 acquisition of a 16 percent equity stake in AT&T Wireless Group in, valued at $9.8 billion, and NTT Communications Corp.'s acquisition of Verio, an internet services provider, for $5.5 billion in September 2000. Both transactions took place at the height of the internet and telecommunications stock market boom, and the high transaction prices were undoubtedly influenced by prevailing conditions. The third-largest Japanese acquisition of the period, in the computer industry, was Hitachi's acquisition of 70 percent of the IBM Corp. hard disk drive business for $2.1 billion in January 2003 [Bureau van Dijk (Zephyr)].

Of the 93 companies in Japan classified as U.S.-owned (compared to 685 companies in the United States classified as Japanese-owned), two-thirds involved the wholesale trade, machinery and equipment manufacturing, and financial services industries. Five of the top 10 U.S.-owned companies in Japan, in terms of operating revenue, were life insurance companies.

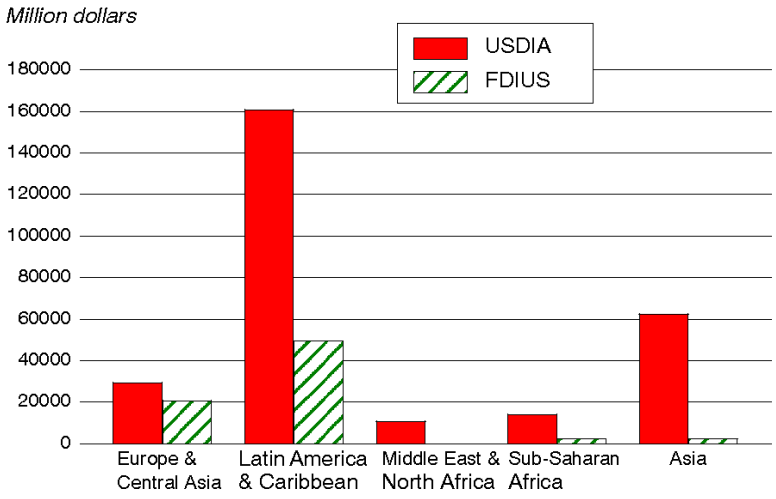
Developing Countries

Middle- and low-income countries as a group accounted for 13 percent of the total USDIA position in 2005, valued at $278.0 billion, compared with 5 percent of FDIUS position, valued at $75.5 billion. Mexico and Brazil were the leading developing countries for both USDIA and FDIUS, as discussed in more detail below, followed by Hungary, Barbados, and China. Figure 11 illustrates the levels of USDIA and FDIUS position in low and middle income countries, by region.[31]

[30] There were four Japanese M&A transactions in the United States since 2000, but the value was reported for only three of them.

[31] This article uses the definitions of low—3P and middle—income economies provided by the World Bank. As of July 2006, countries in which 2005 GNI per capita fell between $876 and $10,725 were considered middle-income economies, and countries in which 2005 GNI per capita was less than or equal to $875 were considered low-income economies. In 2006, 54 countries were classified as low-income economies, 98 countries were classified as middle-income economies, and 56 were classified as high-income economies.

Figure 11 USDIA vs. FDIUS position, for middle-income and low-income countries, by region, 2005

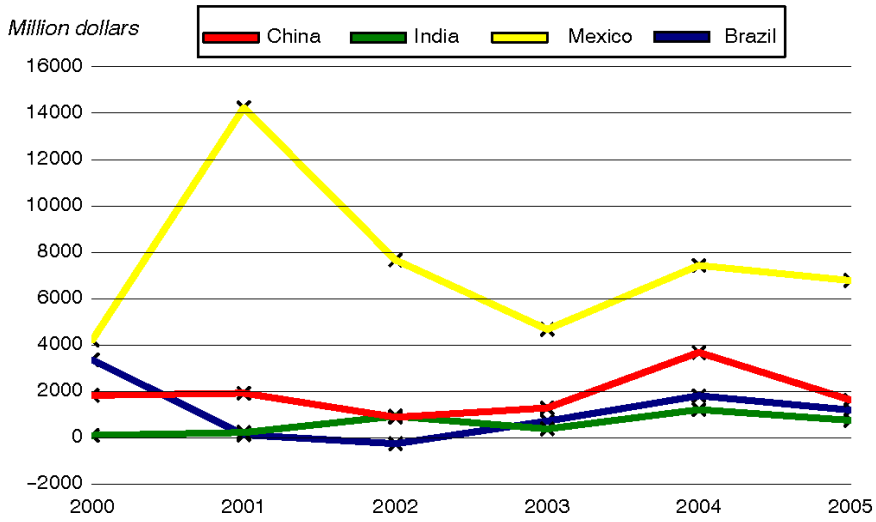


Source: USDOC, BEA.

USDIA in the four developing countries examined here has expanded rapidly since 2000. For all of the recent attention paid to USDIA and other FDI in China, the data clearly show that USDIA in Mexico continues to outpace U.S. investment in all other developing countries, as measured by annual capital outflows (figure 12) and by combined FDI outflows for 2000-2005 (figure 13). Combined outflows to China during 2000-2005 totaled 26 percent of U.S. capital outflows to Mexico during that period. USDIA stock in China grew at an average annual rate of 9 percent, compared with 13 percent for Mexico. By comparison, USDIA stock in India recorded average annual growth of 29 percent, more than double the rate of either China or Mexico, although FDI in India built on a much smaller base, with total USDIA position in India valued at $8.5 billion in 2005.

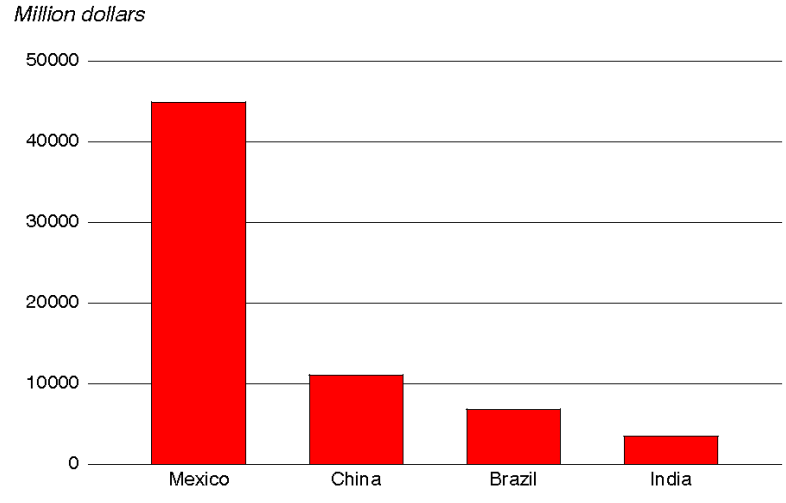
In general, developing countries tend to be recipients of FDI from the United States, not investors in this country, although there are exceptions to this principle. However, even though the amounts are smaller, the ongoing process of globalization has affected inbound FDI from developing countries as well. For all of the developing countries discussed below, FDIUS has increased substantially since 2000, with FDIUS from Mexico recording a particularly large increase.

Figure 12 USDIA, annual capital outflows to China, India, Mexico and Brazil, 2000-2005



Source: USDOC, BEA.

Figure 13 USDIA, combined capital outflows, 2000–2005



Source: USDOC, BEA

Mexico

USDIA stock in Mexico was valued at $71.4 billion in 2005, far more than in any other developing country, and is growing rapidly, as noted above. Overall growth in the USDIA position in Mexico was 92 percent between 1999 and 2005. The close economic relationship between the two countries is a result of the long common border, shared history, and the NAFTA agreement. In Mexico, U.S. outbound direct investment is most concentrated in manufacturing, depository institutions, and finance and insurance. Overall, Mexico accounted for about 50 percent of all USDIA stock in Latin American finance and insurance services from 2000 to 2005, and 75 percent of USDIA in depository institutions from 2003 through 2005.[32] A number of U.S. banks have important investments in Mexico, including Citigroup, which acquired 100 percent of Grupo Financiero Banamex in 2001 for $12.5 billion. Bank of America acquired a 25 percent equity stake in Grupo Financiero Santander-Serfin in 2003 for $1.6 billion. Principal Financial acquired 100 percent of Afore Tepeyac, a Mexico insurance and pension fund provider, for $57.7 million in 2003.[33]

U.S. firms also have wide-ranging investments in Mexico's manufacturing sector. Well over 1000 U.S. companies control affiliates in Mexico, with more than 600 involved primarily in manufacturing. As measured by reported operating revenue, the leading U.S.-owned manufacturing firms are Elektrisola, a maker of fabricated wire products, Anheuser-Bush, a brewery, and Dawn International, a wholesaler of commercial equipment.[34] Leading U.S.-owned firms in terms of employment are Pepsico, the beverage manufacturer, auto parts manufacturer Delphi, and Lear Corp., which is primarily a manufacturer of plastics and electrical systems. All of these U.S. companies control several or more separate Mexican subsidiaries (table 18).

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[32] A consequence of the 1990s boom in such investment was the significant shift in the structure of financial systems in emerging market economies such as Mexico. Most notably, the share of assets held by foreign banks increased considerably. In Mexico, foreign ownership of the banking sector is as high as 80 percent. Bank for International Settlements.

[33] Bureau van Dijk (Zephyr).

[34] Operating revenue for latest available year, as reported by Bureau van Dijk (Orbis). Not all companies report operating revenue for all subsidiaries.

TABLE 18 Selected U.S. manufacturing companies in Mexico, 2006

U.S. parent company	Employment by Mexican affiliates	Annual operating revenue of Mexican affiliates	Number of Mexican affiliates	Primary business
Pepsico Inc.	58,424	3,818,714.8	17	Beverages
Delphi Corp.	57,745	119,040.1	21	Automobile parts
Lear Corp.	27,776	486,457.6	6	Plastics and electrical systems
Anheuser-Busch Companies, Inc.	13,255	8,489,813.3	13	Beverages
Emerson Electric Co.	12,380	220,866.1	21	Industrial instruments
Whirlpool Corp.	12,050	0.0	3	Domestic appliances
Jabil Circuit Inc.	11,400	63,146.2	4	Electronic equipment
General Motors Corp.	10,000		1	Automobiles
Sanmina-Sci Corp.	9,501		3	Electronic equipment
E. I. du Pont De Nemours and Co.	8,375	478,459.5	5	Chemicals
Sara Lee Corp.	8,373	244,991.5	8	Food and consumer goods
Mattel Inc.	8,000		2	Toys
Kimberly Clark Corp	5,700	2,203,989.9	4	Paper and consumer products
Dana Corp. (FL)	4,541	981,565.8	12	Auto parts
Praxair Inc.	1,415	3,590,294.4	2	Industrial gases
Dawn International Holdings, Inc.	253	4,394,738.3	1	Grain mill products manufacturing and wholesale distribution
Elektrisola, Inc.	210	13,340,013.0	1	Fabricated wire products
Solutia Inc	110	2,245,470.8	1	Chemicals

Source: Bureau van Dijk (Orbis).
Note: Empty cells imply no data are available.

Mexico held the largest share of FDIUS among low- and middle-income countries in 2005, accounting for $7.9 billion of inbound investment and ranking 16th among all countries. Direct investment stock from Mexico accounted for 16 percent of all FDIUS from low- and middle-income countries, and increased at an average annual rate of 32 percent between 1999 and 2004. FDIUS stock from Mexico was valued at $8.7 billion in 2005. FDIUS from Mexico was largest in the wholesale trade and "other industries" category.

India

Among low-income economies,[35] India hosted the largest share of total U.S. outbound stock, with $8.5 billion, or 0.4 percent, of total U.S. outbound stock in 2005, up from $7.7 billion in 2004, an increase of 10 percent in a single year, and from $2.4 billion in 1999. The FDIUS position from India was valued at $1.4 billion in 2005, a thirteenfold increase over the 1999 amount but, as is typical for developing countries,much less than outbound USDIA to India. For both inbound and outbound U.S. investment, FDI between the United States and India has grown particularly rapidly. USDIA stock in India increased by a total of 247 percent between 1999 and 2005, with average annual growth of 23.4 percent, as India has begun to remove barriers to trade and investment, and U.S. investor interest in the country has increased.

Information was the leading industry for USDIA in India in 2005, followed by depository institutions and professional, scientific, and technical services. U.S. firms were involved in 115 mergers with or acquisitions of Indian companies between 2000 and 2005. Almost one-half of these was classified in the computer and internet services industry, followed by strong interest in the areas of personal and business services and industries and electric machinery.

Professional services was the lead industry for FDIUS from India, accounting for 82 percent of the total in 2005. Tata America International Corp., a subsidiary of Tata Sons Ltd., the Indian business services company, is the largest Indian-owned firm in the United States, measured in terms of operating revenue. Tata America, which provides computer programming and data processing services, reported 2004 revenue of $810 million, almost 10 times the value reported by the next Indian-owned company, Caraco Pharmaceutical Laboratories. Tata is a world leader in business process outsourcing, with operations in 34 countries during 2006. Indian firms have successfully taken advantage of trends toward business process outsourcing, performing a variety of business services for U.S. corporations, as well as corporations based in a variety of other countries,

[35] China and Brazil are classified as lower-middle income economies by the World Bank; Mexico is classified as an upper-middle income economy.

including call center operations, back office accounting operations, etc. When companies in the United States employed companies located in India for these processes, these transactions appear in official statistics as part of cross-border trade in services. However, when Indian firms such as Tata establish offices directly in the United States, the transactions are included in the FDI statistics.

Brazil

After several years of decline, the USDIA position in Brazil posted an increase of more than $2 billion in 2005, bringing the total to $32.4 billion, although still 13 percent below the 1999 level of $37.2 billion. USDIA in Brazil is strongest in manufacturing,with $13.5 billion, of which the largest share is in the chemicals industry ($3.9 billion). U.S. investors also have an investment position of $7.7 billion in Brazilian financial services firms, including banks. Recent capital flows to Brazil were most prominent in the holding companies and mining industries. Within manufacturing, the largest shares of recent capital flows have been invested in the food and chemicals manufacturing areas. Recent capital flows to Brazilian depository institutions have been quite small (combined $216 million during 1999-2005), and negative to the other financial services industries. Table 19 shows the leading U.S.-owned companies in Brazil, in order of operating revenue, illustrating the diversity of USDIA in that country.

TABLE 19 U.S.-owned companies in Brazil, 2006

Brazilian company	U.S. parent company	Employment by Brazilian affiliate	Annual operating revenue of Brazilian affiliate	Industry
Cargill Agricola SA	Cargill	6,200	4,504,814	Soybean oil mills
Eletropaulo Metropolitana Eletricidade de Sao Paulo SA	AES Corp.	NA	3,556,183	Electric utility
Chevron Brasil	Chevron Corp.	939	3,196,775	Petroleum wholesaler
Brasmotor SA	Whirlpool Corp.		2,164,613	Household appliance manufacturer
Whirlpool SA	Whirlpool Corp.		2,121,918	Household appliance manufacturer
Xerox Comercio E Endustria Ltda	Xerox Corp.	1,500	1,257,520	Machinery manufacturer
Dow Brasil SA	Dow Chemical Co.	900	1,201,812	Chemical manufacturer
Alcoa Aluminio SA	Alcoa Inc.	6,579	922,470	Aluminum production
Seara Alimentos SA	Cargill	NA	848,309	Poultry farms
Agco do Brasil Comercio Industria	Agco Corp.	2,296	700,613	Transportation equipment manufacturer (industrial trucks and trailers)
Hewlett-Packard Brasil	Hewlett-Packard Co.	1,328	654,568	Wholesaler of computers and peripheral equipment

Source: Bureau van Dijk (Orbis).
Note: Blank cells imply no data available.

Brazilian investment in the United States is comparatively quite small, valued at $2.6 billion in 2005, with the largest share in depository institutions. There are four active Brazilian-owned banks in the United States,[36] of which the largest by far is Banco do Brasil, with reported assets of $4.0 billion in the United States at the end of 2005 (FRB 2006). In recent years, however, by far the largest share of Brazilian capital outflows to the United States (81 percent) have been directed to the wholesale trade industry.

There are at least 459 U.S.-owned firms with affiliates in Brazil, of which 55 percent is manufacturing firms. Within the service sector, the primary areas for U.S.-owned companies are wholesale trade, finance and insurance, professional, scientific, and technical services, and administrative services. Manufacturing firms frequently establish wholesale trade affiliates in foreign markets, and there is a wide variety of U.S.-owned manufacturing firms in Brazil. Among the top 40 U.S.-owned firms by annual operating revenue are the Brazilian affiliates of Whirlpool, Xerox, Dow, Hewlett Packard, 3M, Johnson & Johnson, Caterpillar, and Navistar. U.S. financial services firms in Brazil include Bank of America and two insurance companies, Chubb Corp., and Principal Financial Group.

China

U.S. direct investment stock in China reached $16.9 billion in 2005, equal to less than 1 percent of total USDIA stock, but recording average annual growth of over more than 10 percent during 1999-2005 (USDC BEA 2004). Annual flows of new U.S. investment into China remained under $2 billion during 1999-2003, then increased to $3.7 billion in 2004, before dropping back to $1.6 billion in 2005 (figure 14). Slightly more than half of USDIA stock in China was invested in manufacturing, with the remainder spread between wholesale trade, mining, and holding companies.

Sales by U.S.-owned foreign affiliates grew rapidly during 2000-2003 in China, increasing at an average of 25 percent per year.[37] This likely reflects the liberalization of many Chinese foreign investment regulations following China's WTO accession in 2001, with U.S. and other foreign firms permitted to operate in many cities formerly closed to foreign investors. In addition, the rapid growth of affiliate sales in China points out that USDIA in China is aimed at sales to Chinese consumers as well as production for export.

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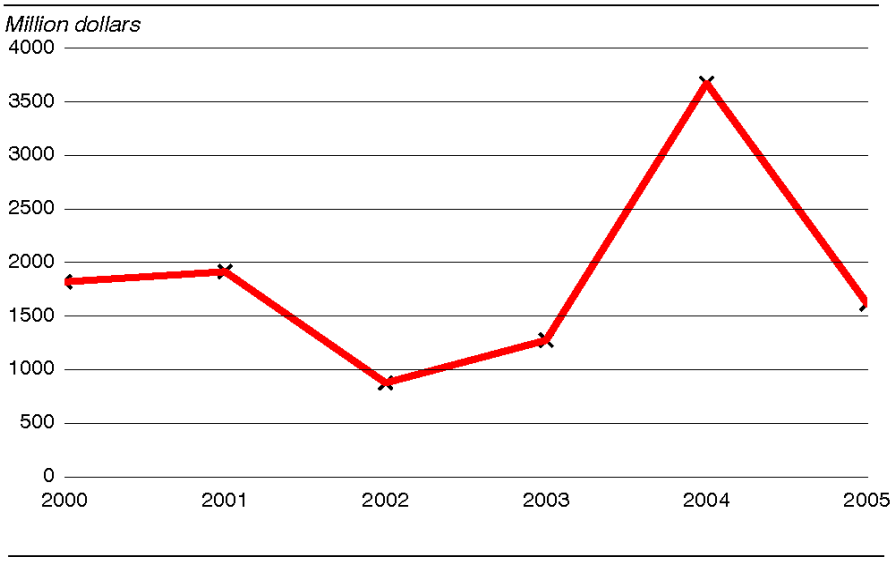
[36] Two Brazilian banks, Unibanco-Uniao De Bancos Bras and Banco Itau-BBA SA, have representative offices in the United States that do not transact business here.

[37] Data for foreign affiliate sales in China in 1999 were suppressed to avoid disclosure of data of individual companies.

Figure 14 USDIA capital outlows to China, 2000-2005



Source: USDOC, BEA.

Conclusion

The FDI relationship between the United States and its primary investment partners is a close and complicated one. The article illustrates the particularly close economic relationship between the United States and Europe, particularly the United Kingdom. Within Europe, the most prominent industry destination for USDIA is holding companies, particularly in the Netherlands, the United Kingdom, and Luxembourg. As noted, it is likely that most of this capital is reinvested in operating companies in the manufacturing sector within Europe. U.S. FDI in the North American Free Trade Agreement (NAFTA) countries is primarily destined for Canada, although there is a strong FDI relationship with Mexico as well. The largest shares of USDIA in the NAFTA region are invested in manufacturing, particularly chemicals and transportation equipment, and finance and insurance. In the Asia-Pacific region, the largest FDI destinations are Japan and Australia. Japan dominates FDIUS from the region. Manufacturing FDI in the Asia-Pacific are focused on computers and electronic equipment. In Latin America and the Caribbean, excluding Mexico, holding companies are the most significant destination for USDIA, although Bermuda also attracts significant USDIA to the reinsurance industry. There is little FDIUS from the region. Africa and the Middle East have attracted only a very small share of

overall USDIA, primarily concentrated in the mining sector, which includes the petroleum industry.

Multinational corporations based in Europe, North America, and the developed countries of the Asia-Pacific region have extensive operations and assets in the United States, as U.S.-based companies do throughout the world. These MNCs are the primary means through which FDI is transferred between countries, reinforcing the extensive global economic linkages between countries today.

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U.S. Trade Law and FTAs: A Survey of Labor Requirements

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Abstract

This journal article is a primer of the new labor legislation. It catalogs the standards set out in each agreement and any new pre- or post-FTA labor legislation initiated by U.S. trading partner countries. The article cites evidence for progress towards the rights of the labor force, new mechanisms for dialogue, and an emerging greater transparency in the enforcement of labor law worldwide.

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Introduction

Recent discussion of trade agreements in the U.S. Congress and the public media has focused on the rights of the international labor force. In fact, this discussion is not new----U.S. trade policy has a long history of concern for the rights of labor at home and in our trading partner countries. This journal article is a primer of the labor components of U.S. trade legislation. It catalogs the standards set out in each agreement and any new pre-- or post--FTA labor legislation initiated by U.S. trading partner countries. The article cites evidence for progress towards the rights of the labor force, new mechanisms for dialogue, and an emerging greater transparency in the enforcement of labor law worldwide.

The Problem With Trade Liberalization

Trade liberalization is seldom easy, even as economists almost universally acknowledge the benefits of opening markets to international trade. The liberalization process is especially difficult in an open, democratic system because inevitably some investors and firms will gain and others will lose, at least in the short-term. It is the struggle between the gainers an d losers that is so hard to balance in the political process.

Less competitive industries and less efficient firms will lose. Although their loss does matter the core political problem is the effect of the new competition on workers, wages, and income.[2] The AFL-CIO has commented—

> "Free trade agreements like the North American Free Trade Agreement (NAFTA) and the agreements of the World Trade Organization (WTO) are hurting U.S. workers. These agreements allow imports made under inhumane conditions to

[2] Even the agriculture issues in Doha are labor related. Developed countries are concerned with "small" farmers staying on the farm. Developing countries face the reality of tens of millions of small and subsistence farmers driven from the land by unbridled first world corporate agricultural production. The prospect of hundreds of millions of displaced farmers across the globe desperately willing to take on any jobs to scratch out an income for their families creates an unnerving prospect for more protected workers in developed countries.

> flood our markets, undercutting U.S. jobs and wages. They encourage U.S. companies to scour the world looking for the lowest wages, the weakest labor laws and the most vulnerable workers."

Ineluctably it seems, the forces of globalization push governments toward more liberalization. As globalized agriculture issues have blocked the Doha negotiations, debate has re-focused itself on less globalized regional agreements. The most intense discussions have centered on worker gains and losses, both in the United States and abroad. Trade agreements and trade promotion authority hang precariously on (1) the inclusion of labor rights in future negotiations and on (2) the question whether workers would be better off with more or with fewer trade agreements.

This article has four specific goals: (1) To summarize the impact of U.S. trade laws and policy on the labor standards of our trading partners, (2) To review what has been required for labor standards in established free trade agreements (FTAs), (3) To summarize the legal and regulatory changes to labor standards and practices that have been formally instituted in these trading partners in line with the FTAs, and (4) To identify some remaining areas of concern. These sections are intended to be descriptive. The merits of the provisions are neither weighed nor compared; the purpose is simply to lay out what has occurred. The critical area not covered is the enforcement of laws and regulations by FTA partners. That effort requires ongoing monitoring, which is beyond the scope of this paper.

Labor Standards and U.S. Trade Law

Imposing labor standards on trade with the United States is nota new practice. The McKinley Act of 1890 first linked trade to foreign labor conditions, restricting imports produced by prison labor. The Tariff Act of 1930 prohibited convict-made goods. The Article XX(e) of the General Agreement on Tariffs and Trade (GATT) acknowledged the right of nations to restrict items produced by forced labor. Since then, labor standards have been incorporated intovirtually every part of U.S. trade law: the Tariff Act of 1930; the Generalized System of Preferences (GSP) in 1974; Section 301 of the Trade Act of 1974; the Caribbean Basin Economic Recovery Act (CBERA) in 1983; the Andean Trade Preference Act (ATPA) in 1992; the Overseas Private Investment Corporation (OPIC), the Multilateral Investment Guarantee Agency (MIGA); the North American Free Trade Act (NAFTA) in 1994; and the Trade Act of 2002. In particular, the NAFTA lists 11 specific worker rights, including the core labor standards covered by the

GSP program, with additional protections concerning employment discrimination on the basis of race, sex, religion and age; equal pay for men and women; compensation for occupational injuries; and protections for migrant workers.

GSP and Workers Rights

The Trade Act of 1974 created the Generalized System of Preferences (GSP) program to promote growth in developing countries. With GSP benefits, 137 developing countrie sex port approximately 3,450 different products duty-free to the United States each year. Least developed countries (LDCs) are eligible to export an additional 1,400 products duty-free. In the first 11 months of 2005, nearly $25 billion worth of duty-free GSP imports entered the United States. This number excludes textile and apparel products, almost all of which are ineligible for duty-free treatment under the GSP program.

In 1984, Congress added a requirement that GSP participation be conditional on taking steps to afford basic labor standards (19 U.S.C. 2411(d)(3)(B)(iii)). Since that time, the following GSP labor requirements have set a precedent for subsequent FTAs. Failure to take steps to afford these five rights can jeopardize a country's GSP status for some or all of its products:

1. The right of association;
2. The right to organize and to bargain collectively;
3. A prohibition on the use of any form of forced or compulsory labor;
4. A minimum age for the employment of children and a prohibition on
5. the worst forms of child labor; and
6. Acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health.

Conditioning worker rights with trade benefits under the GSP has contributed to the improved treatment of workers in developing countries. Since 1984, 15 GSP beneficiaries have been sanctioned for worker rights violations. Seven have not had their status restored. Many more have corrected problems to avoid suspension. In November 2000, Swaziland modified its constitution to guarantee better protection of worker rights in order to qualify for GSP benefits. Similar efforts began around the same time in Uganda to ensure that the country's labor officials are enforcing recent legislation. Uganda has since passed and implemented new legislation, initiated a new industrial court that will address labor issues, and posted labor inspectors in each district of the country. A new legal structure has also been put in place for improved labor-management relations in the Ugandan textile sector. Additionally, the United States restored Liberia's GSP status in 2006 after the Johnson-Sirleaf

legislature repealed Charles Taylor's Presidential Decree No. 12, which banned the right to strike.

GSP petitions generally are more successful when human rights groups are involved, suggesting that they lend greater legitimacy to the demands for improved workers' rights. The degree of democracy in a country is correlated with the success of petition. Only two successful cases involved countries that the US nongovernment organization Freedom House, which assesses political freedoms around the world, judged to be "not free." By contrast, among the 17 failed petitions, nine were in countries judged "not free," with Freedom House giving its lowest possible ranking to three of those (Elliot 2003).

Imposing labor standards needs not be merely a form of protectionism. Institute of International Economics (IIE) scholar Kimberly Ann Elliot finds that—

> "The evidence further suggests that unions and other supporters of internationally enforced labor standards are concerned about foreign workers and are not just looking for an excuse to block imports from labor-intensive countries. Of course, it is also in the interest of unions to emphasize protection of union rights abroad if they believe that improves their bargaining leverage at home with relatively more mobile multinational corporations" (Elliot 2003).

Further, polls consistently show that Americans support trade liberalization when it leads to improved conditions for foreign and domestic workers.[3]

Fast-Track Authority and Labor Standards

Trade liberalization efforts were aided by the U.S. President's "fast-track" authority under which the Uruguay Round and North American Free Trade Agreement (NAFTA) were negotiated and adopted. The legislation providing this authority promoted labor-related objectives: to ensure that the benefits of

[3] "An overwhelming majority (of Americans) favored compliance with labor standards as part of international trade agreements. An overwhelming majority also felt that the United States should not allow the importation of products that have been made in conditions in violation of international labor standards." (Americans on Globalization, 2000). Confirmed recently by new World Public Opinion and Chicago Council on Global Affairs survey, *International Publics Strongly Favor Labor and Environmental Standards in Trade Agreements,* which found 93 percent of Americans (more than any other nation surveyed) believed that trade partners should maintain at least minimum standards for workers.

the trading system are available to all workers, and to ensure that the denial of workers' rights should not be a means for a country or industry to gain a competitive advantage (CRS2002). These objectives were incorporated, albeit tangentially, into the implementing language of the Uruguay Round (Brown 2000). The NAFTA was the first U.S. international trade agreement actively to include labor provisions. A labor side agreement known as the North American Agreement on Labor Cooperation (NAALC)[4] required each party to maintain high levels of labor protection without lowering standards to attract investors. It lays out seven basic objectives:

1. To improve working conditions and living standards;
2. To promote labor principles set forth in annex 1;
3. To encourage cooperation in promoting innovation and rising levels of productivity and quality;
4. To exchange information, data and studies to promote mutual understanding of laws and institutions in member countries;
5. To pursue cooperative labor-related activities of mutual benefit;
6. To promote each party's compliance with, and effective enforcement by each party, of its labor laws; and
7. To foster transparency in the administration of labor laws.

The NAALC stated principles specify 11 labor rights (NAALC, annex 1):

1. The freedom of association and protection of the right to organize;
2. The right to bargain collectively;
3. The right to strike;
4. The prohibition of forced labor;
5. Labor protections for children and young people;
6. Minimum employment standards, including minimum wage;
7. The elimination of employment discrimination;
8. Equal pay for women and men;
9. The prevention of occupational injuries and illnesses;
10. Compensation for occupational injuries and illnesses; and
11. Protection of migrant workers.

The NAFTA partners agreed to promote all 11 principles and to comply with their own labor laws and standards relating to these principles. When enforcement of the relevant rights is in question, the agreement outlined a

[4] NAALC is one of two side agreements to the NAFTA—the other concerns environmental cooperation. The NACLC established as part of the agreement, oversees the implementation of the agreement and monitor the abilities of the Parties to meet the obligations. NAFTA became effective January 1, 1994. See 9 U.S.C. §§ 3301-3473 (NAFTA) and specifically § 3471 for NAALC.

process for the parties to engage in government-to-government discussions. However, only three of these principles were made enforceable by sanctions if a country does not self-enforce: labor protections for children; minimum employment standards; and the prevention of occupational injuries and illnesses. The agreement (part II, article 3) required each party to "promote compliance and effectively enforce its labor law through appropriate government action." The NAALC further outlined procedures for consultation, the resolution of disputes and penalties for violation of the agreement.

To date, 34 complaints have been submitted through the NAALC. Twenty-one were filed with the U.S. administrative system, of which 19 involved allegations against Mexico and two against Canada. Eight were filed with the Mexican National Administrative Office (NAO) within the Labor Ministry. These eight involved allegations against the United States while another five submissions have been filed in Canada, three raising allegations against Mexico and two against the United States. Nineteen of these submissions have undergone complete review, and 14 have resulted in Ministerial-level consultation[5](Bureau of International Labor Affairs).

The Trade Act of 2002

The U.S. Congress formally established a framework for U.S. trade negotiations as part of Bipartisan Trade Promotion Authority (TPA)—renewal of fast-track authority—under the Trade Act of 2002 (19 U.S.C. §§ 3801-3813 (P.L. 107-210); signed into law August 9, 2002). The TPA includes labor provisions in both the principal and overall trade-negotiating objectives for trade agreements, including FTAs.[6]"Core labor standards," as defined by the TPA, are the same workers' rights identified in the U.S.-Jordan FTA (reviewed in the following section) and in the U.S. preferential trade programs noted above. The specific labor provisions included within the overall negotiating objectives are as follows:

1. Top romote respect for worker rights and the rights of children consistent with core labor standards of the ILO (as defined in the TPA (§ 2113(6)), and an understanding of the relationship between trade and worker rights (19 U.S.C. 3802(a)(6)).The core ILO standards defined in the statute (19 U.S.C. 3813(6)), track the GSP program, *supra.*

[5] Further details on submissions are available through the U.S. Department of Labor, Bureau of International Labor Affairs *http://www.dol.gov/ilab/programs/nao/status.htm*

[6] Dispute settlement procedures are only available for labor provisions included within the principal negotiating objectives of the Trade Act of 2002, unless otherwise noted.

2. To seek provisions in FTAs in which the parties strive to ensure that they do not weaken or reduce the protections afforded in domestic labor laws as an encouragement for trade (§ 2102(a)(7)).

3. To promote universal ratification and full compliance with ILO Convention No. 182 concerning the Prohibition and Immediate Action for the Elimination of the worst forms of child labor (§ 2102(a)(9)).

Since the enactment of TPA legislation, the United States has negotiated and entered into FTAs containing workers' rights provisions with the following countries: Singapore (chapter 17); Chile (chapter 18); Australia (chapter 18); Morocco (chapter 16); Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras and Nicaragua (CAFTA-DR, chapter 16); Bahrain (chapter 15); Oman (chapter 16); Peru (chapter 17); and Korea (chapter 18). Labor issues are also a component of ongoing U.S. FTA negotiations with Colombia; Ecuador; the United Arab Emirates (UAE); Thailand; Botswana, Lesotho, Namibia, South Africa, and Swaziland (SACU).[7]

Summary of Labor Provisions in FTAs

Jordan (2000)

Preceding the TPA legislation of 2002 (and thus lacking fast-track authority), the United States opened and completed the U.S.-Jordan FTA negotiations in 1994 (19 U.S.C. § 2112 note, P.L.107-043). Signed on October 24, 2000, the agreement was the third U.S. FTA, following the U.S.-Israel FTA (1985) and the NAFTA, and the first with an Arab country. It was also the first to include labor and environment provisions in the main body of the agreement. Prior to the agreement, major labor reforms in Jordan in 1996 had brought many labor laws up to international standards (specifically changing the minimum age for labor from 13 to 16 years). And in 1999, Jordan officially ratified ILO convention No.182 to eliminate the worst forms of child labor.

[7] Under the TPA legislation, the U.S. Department of Labor must submit three labor-related reports to the U.S. Congress for each new FTA. These include (1) a report assessing the potential impact of the FTA on U.S. employment, (2) a report on labor conditions in the partner country/countries, and (3) a report on the partner country/countries laws governing exploitative child labor and compliance with ILO Convention No. 182 Concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labor. These reports are public and are posted at the U.S. Department of Labor's website.

The labor chapter (article 6) consists of six paragraphs and asserts that each party shall“ trive to ensure ”that it slab or principles are protected by domestic law (article 6.1) and are not weakened to encourage trade (article 6.2). It recognized that each party has the right to establish its own domestic labor laws and regulations, but which must be consistent with the internationally recognized labor rights (article 6.3). Each party “shall not fail to effectively enforce its labor laws.” Each retains the right to exercise discretion over investigatory, regulatory, and compliance matters and the level of resources committed (article 6.4). Cooperation between the parties to improve labor standards is “encouraged” (article 6.5).

The agreement defined “labor laws” as statutes or regulations directly related to–(1) the right of association; (2) the right to organize and bargain collectively; (3) the prohibition on the use of any form of forced or compulsory labor; (4) minimum employment age; and (5) acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health (article 6.6). All of these provisions are subject to the agreement dispute settlement process.

The United States maintains an ongoing dialogue with key actors in the labor sector in Jordan, including union leaders, ILO officials, industrial park managers, factory owners and government representatives. On several occasions U.S. officials and the Jordanian Government discussed implementation of Jordan’s international commitments to fight child labor and trafficking (Country Report on Human Rights Practices 2005).

Singapore (2003)

The U.S.-Singapore FTA was the first in the series of FTAs negotiated and implemented under the authority of the Trade Act of 2002. In 2000, President Bill Clinton and Singaporean Prime Minister Goh Chok Tong announced the beginning of FTA negotiations. On May 6, 2003, President Bush signed the agreement. Implementing legislation was passed in July of that year, in tandem with the Chilean FTA. Debate in Congress centered, first, on the future use of the agreement labor and environmental provisions as a template for other FTAs and, second, on dissatisfaction with the movement of natural persons provisions of the legislation.

Growing attention to labor standards is reflected in the Singapore Agreement. Chapter 17, “Labor,” spans three-and-a-half pages (compared to six paragraphs in the Jordan FTA), including a two-page annex specifying the requirements of the U.S.-Singapore Labor Cooperation Mechanism. It is useful to cover it in depth here inasmuch as it lays the foundation for subsequent FTAs and serves as a reference point.

Chapter 17 reaffirms the parties' commitment to the ILO Declaration of Fundamental Principles and Rights at Work and to "strive to ensure" that its laws provide for labor standards consistent with internationally recognized labor rights (article 17.1). Each party guarantees "to effectively enforce its labor laws," but retains the right to exercise discretion with respect to investigatory, prosecutorial, regulatory and compliance matters, and resource commitments. Each agrees that it is inappropriate to encourage trade or investment by weakening protections (article 17.2). Each ensures that parties with a legally recognized interest "have appropriate access to administrative, quasi-judicial, judicial, or labor tribunals for the enforcement of the Party's labor laws." Proceedings must be "fair, equitable and transparent. "Remedies to ensure the enforcement of rights must be available. Parties shall promote public awareness of the laws (article 17.3).

The agreement details institutional arrangements for labor protections. The Joint Committee set up (chapter 20) to oversee Administration and Dispute Settlement was intended to include discussion of labor. The Dispute Settlement provisions limited annual damages to $15 million per violation per annum, with an inflation factor based on the U.S. inflation rate, for assessments after 2004 (article 20.7). This provision, criticized for not providing sufficient incentive for compliance, is consistent through subsequent FTAs.

The subcommittee on labor affairs, comprised officials of both parties, was to meet as deemed appropriate. Each party 'shall' designate an office within its labor ministry to serve as a point of contact with the other party and the public for the purpose of enforcing this chapter. Each party could convene a "national labor advisory committee, comprising members of its public" to advise on the implementation of this chapter. All formal decisions regarding implementation were to made public (article 17.4).

The agreement established a framework for technical assistance (article 17.5), detailed in the annex. Dispute resolution on any matter was set to commence within 30 days of a request by either party. If failing to resolve the matter, the Subcommittee on Labor Affairs was to be convened within 30 days. If a resolution were not reached, either party can pursue the issue under dispute settlement procedures under article 20.4.2(a) (article 17.6). Definitions of labor laws are clarified in article 17.7.

Recognizing the value of cooperation, the agreement established a Labor Cooperation Mechanism, set forth in annex 17A, which identifies contact points (officials of labor ministries and other agencies) for establishing priorities, developing specific cooperative activities, and for exchanging information related to related to labor-management relations, working conditions, unemployment assistance, human resource development and labor statistics. Cooperation was also encouraged through exchanges of people and

information, conferences, and collaborative research or other projects (annex 17A).

Chile (2003)

The United States and Chile announced an agreement December 11, 2002. Implementing legislation was passed the following July. The labor chapter grew to five pages, with a three-page Labor Cooperation Mechanism annex. The U.S. business community supported the agreement as a measure to help compete with Canadian firms that already enjoyed preferential treatment because of the 1997 Canada-Chile FTA. Critics challenged the FTA on the grounds that basic worker rights' obligations, such as freedom of association, the right to form unions and bargain collectively, and limitations on child labor, were not subject to as rigorous a dispute settlement process as was provided in the U.S.-Jordan FTA.

The Chilean agreement labor chapter steps beyond the Singaporean agreement. It added, "(f)or greater certainty," decisions by each party's judicial or administrative tribunals would not be subject to revision or reopening (article 18.3.4). It also elaborates on institutional arrangements. The agreement established a Labor Affairs Council (Singapore FTA left it optional) at the Cabinet level. The council shall meet in public sessions within the first year to review progress and to pursue the labor objectives of the agreement. Each party shall establish an office as a point of contact. The Council "shall establish its work program and procedures," will make decisions public, may convene national advisory committees and shall share and ensure public communications (article 18.4).

A Labor Cooperation Mechanism is defined (article 18.5) and set out in an annex. Cooperative consultations are laid out much as in the Singaporean FTA, but with an admonition for promptness and the use of the formal points of contact. A roster of labor experts is required within six months, who, upon mutual consent of the parties, will serve as panelists in disputes (including four nonparty nationals) related to labor matters. The Labor Cooperation Mechanism adds emphasis on studying social protections (including migration), problems of small and medium-size enterprises, and problems of economic integration for advancing labor objectives (annex 18.5).

Australia (2004)

In 2004, the President signed the FTA with Australia, which was then approved by Congress (House 270-156; Senate 80-16). Labor issues were not a major concern, and the related provisions of the agreement mirrored in more general terms the requirements of Chile and Singapore. An annex was not included.

Bahrain (2004)

The U.S. FTA with Bahrain was signed September 14, 2004, and approved by Congress in 2005 (House 327-95 with 10 not voting; Senate: voice vote approving).[8]The labor chapter followed the Singapore/Chile language but included extra detail under Procedural Guarantees and Public Awareness. It specified that tribunals enforcing labor laws "comply with due process of law" be public, parties be entitled to defend their positions with information or evidence, and "proceedings do not entail unreasonable charges or time limits or unwarranted delays." Final decisions are based on the merits of the case (evidence heard publicly) and must state in writing the reasoning behind the decision. Parties in such proceedings shall have a right to seek review of the decisions. Tribunals shall be impartial and have no substantial interest in the outcome of the matter (article 15.3).

A subcommittee of labor affairs may be established to discuss matters related to labor relations between the two countries (article 15.4). A Labor Cooperation Mechanism was not set up explicitly.

Morocco (2004)

The Morocco FTA is an integral part of President Bush's strategy to create a Middle East Free Trade Area by 2013. The agreement was approved by Congress in July 2004 (House 323-99; Senate 85-13) and support was broad.[9] However, the Labor Advisory Committee expressed concerns, echoed by several Democratic members of the Ways and Means Committee at the July 7, 2004,hearing, that the trade agreement does not go far enough in encouraging Morocco to meet basic international labor standards (CRS report on the US-Morocco FTA).

Extra steps were taken in the Morocco agreement to surpass the Singapore/Chile provisions; official contacts in the respective labor ministries were required (article 16.4) and a Labor Cooperation Mechanism was set out (annex 16A). Labor consultations were placed back on a 30-day schedule for convening a subcommittee to discuss problems. In addition, two side letters were included. The first establishes an agreement between parties that

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[8] Bahrain has diversified its economy away from dependence on petroleum and has created a services hub for information technology, telecommunications and health care. U.S. merchandise trade with Bahrain totaled $802.6 million in 2002. Imports of $395.1 million included apparel, textiles, fertilizers, chemicals and aluminum and exports of $407.5 million were led by aircraft and aircraft parts, military equipment, passenger vehicles, machinery and not surprisingly, air conditioning equipment (CRS, 2004 "Trade Negotiations in the 108th Congress").

[9] By July 2003, a Moroccan Caucus had been formed in the House of Representatives.

nonnationals are provided all the rights and benefits of citizens under the respective labor laws (Zoellick letter, June 15, 2004). The second letter confirms the understanding that if a dispute arises related to a party's implementation of the labor provisions (and for environmental provisions) of the agreement, panelists hearing the dispute "other than those chosen by lot from the reserved list shall have expertise or experience relevant to the subject matter that is under dispute" (Zoellick letter, June 15, 2004).

CAFTA-DR (2005)

On August 5, 2004, the United States, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic signed the CAFTA-DR.[10] In July 2005, the agreement was approved by Congress (House 217-215; Senate 54-45). At the time of this writing ,all signatories but Costa Rica have ratified the agreement.[11]Criticism arose from those supporting agriculture (primarily sugar), environment and labor interests, including strong opposition from organized labor.[12]

Chapter 16 (Labor) of the CAFTA quotes some of the language of the Bahrain agreement for procedural guarantees, specifically calling for due process (article 16.3). It calls for a Labor Affairs Council to meet within a year and lists one purpose, to create a "Labor Cooperation and Capacity-Building Mechanism." The Council will develop guidelines for considering communications among the official contacts. Decisions of the Council will be by consensus and made public (unless otherwise decided). A labor roster is called for with up to 28 names of individuals willing to handle disputes on labor issues (article 16.7).

The Capacity-Building Mechanism (article 16.5) adds tothe listof laborissues to be considered, including "employment opportunities," "gender," and

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[10] U.S. trade with the region totaled $34.9 billion in 2005. The United States imported $18.1 billion (primarily apparel items, bananas, coffee and integrated circuits) and exported $16.8 billion (led by apparel,textiles, electrical generating equipment and electrical components for assembly).

[11] "The United States is implementing the CAFTA-DR on a rolling basis as countries make sufficient progress to complete their commitments under the agreement. The agreement first entered into force between the United States and El Salvador on March 1, 2006, followed by Honduras and Nicaragua on April 1, 2006, and Guatemala on July 1, 2006. The U.S. Government continues to work with the remaining two CAFTA-DR partners (Costa Rica and the Dominican Republic) to ensure timely and full implementation of the Agreement" (Export.gov).

[12] See for example, John Sweeney, "CAFTA, More False Promises," at *http://www.aflcio.org/aboutus/thisistheaflcio/outfront/cafta.cfm*

"technical" issues, the latter of which includes productivity improvement, best labor practices and the effective use of technologies (annex 16.5)

Oman (2006)

The U.S. FTA with Oman was signed January 19, 2006, and approved by Congress that June (House 221-205-7 abstentions; Senate 60-34).[13]Supporters of the agreement typically cite political and economic reasons. Opponents typically point to labor and human rights issues (CR-Oman 2006). Support came from 24 of the 27 U.S. trade advisory committees representing business labor, environment, state and local government, agriculture, various industries and functional areas. Criticism came from the remaining three trade groups: environment, intergovernmental affairs and labor (CRS Oman 2006). Labor groups, the most vocal critics, concentrated on two basic issues: weaknesses in the proposed agreement, and weaknesses in Omani laws and enforcement, for which the proposed agreement does not adequately compensate.

The labor chapter follows the FTA with Bahrain for due process and procedural guarantees. It includes in labor laws, "a Sultani Decree or Decision," and all Ministerial or local decisions promulgated pursuant to it (article. 16.7).

[13] The U.S.-Oman FTA is the fifth U.S. bilateral FTA with a country in the proposed Middle East Free Trade Area (MEFTA). MEFTA would consist of 16 countries in the Middle East and four in North Africa. Other U.S. FTAs in the Middle East are with Israel, Jordan, Morocco, and Bahrain. A sixth is being negotiated with the United Arab Emirates. The proposed FTA with Oman is similar to other MEFTA FTAs and has three basic parts: new tariff schedules, broad commitments to open markets and provisions to support those commitments, and protections for labor and the environment. It would provide immediate duty-free access to the U.S. for almost all consumer and industrial goods, with special provisions for agriculture, textiles and apparel.

Development of Labor Laws and Standards in FTA Partners

Jordan

In 2006, the U.S. National Labor Committee, a U.S. worker advocacy group, released a report detailing labor rights violations in the Jordanian Qualified Industrial Zone (QIZ) factories. QIZ factories are certified to sell under a special arrangement through the U.S.-Israel FTA. Of approximately 54,000 workers in QIZ plants, 66 percent are foreign. Companies outside Jordan owned more than 80 percent of QIZ investments (AmCham Report 2006).

Although Jordan's labor laws fulfilled the FTA requirement for enforcement of core ILO standards, Jordan's 1996 Labor Code excludes noncitizens, along with civil servants, domestic workers, gardeners, cooks and agricultural workers (mostly foreign). Substantial abuses were found, including excessive hours and abuse of overtime pay, poor housing conditions and sanitation, and noncompliance with health and safety regulation. Nearly 200 penalties were imposed by the government and at least two establishments were closed. Measures continue to be applied to prevent further abuses (Jordan Ministry of Labor Report 2006).

Singapore

The Government of Singapore ratified ILO Convention No. 182 in 2001. Beginning in 2003, education became compulsory for all children born after January 1, 1996. The Children and Young Persons Act (2001) and Women's Charter prohibits trafficking in children, and violators are subject to imprisonment for up to five years and a fine not to exceed S$10,000 (US$5,587). Singapore has ratified four ILO core labor standards, one (out of two) in each of the four larger categories: freedom of association and collective bargaining, elimination of forced labor, elimination of employment discrimination, and abolition of child labor. It has denounced Convention105 on forced labor. Nor has the United States ratified convention 105. Singaporean laws cover all five of the worker rights identified for U.S. FTAs.

Chile

Beginning in 1995, Chile began revising its labor code to bring it into compliance with international standards and to address many of the outstanding concerns and complaints of workers. Chilean labor law had been criticized for its weak deterrence of anti-union activities, particularly the use by employers of a "needs-of-the-company" claused esigned to allow companies

to dismiss workers for economic reasons. Unions argued that this had been used primarily to dismiss union members. Workers were unable to appeal their dismissal on the grounds of anti-union bias, and the labor law did not allow reinstatement for unfair dismissals, except in cases of *fuero sindical* (protection of union officials). Employers also were seen to have an advantage during collective bargaining as they were not required to disclose corporate information unless it was relevant to the workers' proposal (ILAB 2003).

With the ratification of ILO Convention No. 182 in July 2000, Chile has ratified all eight ILO core conventions. The revision of the national labor code in 2001 by the Chilean National Congress improved Chile's legislation on freedom of association and the right to organize, while retaining key elements of labor market flexibility (ILAB 2003). In January 1999, Chile ratified ILO Conventions No. 87 on freedom of association and protection of the right to organize and No. 98 on the right to organize and bargain collectively. In September 2001, after six years of discussion and debate, Chile's Senate enacted significant reforms to the labor code, which had been drafted with technical assistance from the ILO. The reforms expanded protection against dismissal of union officials (*fuerosindical*), substantially increased penalties for unfair dismissals, provided for the reinstatement of trade unionists dismissed unjustly and strengthened the laws governing disclosure of corporate information (ILAB 2003). Chile has laws covering all five U.S. internationally recognized workers' rights.

Australia

In 2001 and 2003, the Australian states of Victoria and New South Wales enacted laws to strengthen protections for children in the workplace and, in Victoria, increased fines for child labor abuses. Imposing conditions amounting to slavery carries a penalty of up to 25 years imprisonment under the Criminal Code Amendment (Slavery and Sexual Servitude Act of 1999).

Bahrain

Bahrain enacted significant labor law reforms in 1993 and again in 2002, when the Trade Union Law was promulgated. The 2002 reformed labor law permits independent labor unions for the first time since the early 1970s: Domestic and foreign workers are allowed to form and join trade unions under the new law. The 2002 constitution recognizes freedom of association, and there are now about 40 private-sector unions representing 10,700 workers, and six public-sector unions, representing approximately 6,000 civil servants, operating in Bahrain. The General-Secretary of the International Confederation of Free Trade Unions (ICFTU) in Brussels has publicly hailed Bahrain as showing the way for the region.

The Bahraini legislature is considering additional labor law amendments, including the introduction of an unemployment insurance system. The Bahrain Ministry of Labor has increased the number of inspectors and upgraded their standards and training. Efforts are also under way to better educate workers, including expatriates, about their rights in the workplace. The Ministry has also created a more responsive system to complaints, including a 24-hour hotline that workers can call for advice.

Morocco

The prospect of a FTA with the United States helped to forge a domestic consensus for labor law reform in Morocco, spurring reform efforts that had been stymied for more than 20 years. The U.S. Government, through the Department of Labor, has an assistance program (nearly $9.5 million) designed to improve industrial relations, promote activities to combat child labor and enforcement of the new labor code. A comprehensive new labor law went into effect on June 8, 2004. The law—

1. Increased the minimum employment age (from 12 to 15 years) to combat child labor;
2. Reduced the work week from 48 to 44 hours with overtime rates payable for additional hours;
3. Called for periodic review of the Moroccan minimum wage (effective July1, 2004, the minimum wage will increase by 10 percent);
4. Improved worker health and safety regulations, addressed gender equity in the workplace, and promoted employment of the disabled; and
5. Guaranteed rights of association and collective bargaining and prohibited employers from taking actions against workers because they are union members.

Morocco has ratified seven of the eight ILO core conventions and is considering ratification of the final one.

CAFTA-DR

All six CAFTA-DR signatory countries invited the ILO to perform an assessment of their labor laws in 2003 and 2004, and again asked for the assistance of the ILO in a white paper on labor issued in 2005. Moreover, these countries requested that the ILO review the extent to which their labor laws implemented the ILO core conventions and internationally recognized labor rights.

In their study entitled "Fundamental Principles and Rights at Work: A Labour Law Study, "the ILO found that labor laws on the book sin Central Americaa nd the Dominican Republic were generally in line with the ILO core labor

standards. Indeed, labor laws in effect throughout the region were broadly similartothelaborlawsofscrutinizedintheMorocco-FTAand,insomeareas (such as child labor) were stronger.

Costa Rica

The Costa Rican Government passed new regulations that clarified legal protections given to trade unions and specified limitations on the role of solidarity associations. The government issued administrative guidelines to guarantee the speedy implementation of procedures dealing with allegations of anti-union practices—proceedings must be concluded within 2 months. Having appointed 37 new labor court judges, the government has tried to cut the backlog of labor cases in the judicial system. The government created a Dispute Resolution Center (RAC) within the Ministry of Labor to address mediation and conciliation issues. In 2003, it reported handling 2,462 cases, reaching agreement in nearly 80% of them. Finally, the Ministry of Labor budget increased by 25 percent from 2002 to 2005, strengthening enforcement and labor official training efforts (Working Group 2005).

El Salvador

The El Salvadoran Government has strengthened inspections and enforcement of labor laws. The government raised the Labor Ministry budget through large supplementals for the past two fiscal years; increased the number of labor inspectors from 40 in 2002 to the current 62; implemented a zero tolerance policy against corruption, and dismissed inspectors for this conduct; and decreased the average time to hear a complaint from 3 or 4 weeks to 1 or 2 weeks. The government also increased civil money penalties on anti-union violations to a fine of 10 to 50 times the monthly minimum wage (depending on severity).

To respond to concerns about maquiladoras in free trade zones (FTZ), the Labor Ministry has opened new permanent field offices in the three largest FTZs. In addition, the Free Zones and Commercialization Law was amended and tax benefits and export licenses can now be withheld if firms fail to abide by labor law provisions.

Procedures to register and legally recognize new trade unions were streamlined; the Labor Ministry now provides free legal assistance to workers on how to file a union registration form. Lawyers from the Office of the Attorney General are now based in the Ministry of Labor and provide freelegal assistance to workers filing complaints or initiating judicial proceedings.

In February 2004, the Legislative Assembly approved an amendment to the labor code to prohibit employers from requiring pregnancy tests for women

seeking employment. The new law prohibits this practice as it relates to hiring, dismissals, or any employment condition.

El Salvador was the first country in Central America to ratify ILO Convention 182 on child labor, and the first to commit to a "time-bound" program to eliminate the incidences of these conditions by a fixed date. El Salvador has removed or prevented 15,880 children from exploitative child labor in fireworks production, fishing, sugarcane harvesting, commercial sexual exploitation, and garbage-dump scavenging.

Guatemala

Progress on labor issues in Guatemala has been part of an effort to overcome the legacy of civil war and violence that lasted until 1996. Labor organizations and the private sector were at the center of this conflict, complicating their current relationship. The government has increased efforts to ease these tensions by preventing forms of worker right violations and ending violence against trade unions. During 2003 and 2004, there was a marked decease in reported violence against trade leaders (Working Group, 2005).

Efforts have been made to reform the judicial system for labor. In 2003, the Supreme Court decentralized the court system outside of Guatemala City to improve access to the courts. At the same time, accountability and professionalism of judges and courts throughout the country has been targeted (Working Group 2005).

Finally, the government threatened to revoke export licenses for firms in the EPZ that were noncompliant with labor laws. Shortly after, two maquila factories agreed to the first-ever collective bargaining agreement with EPZ trade unions. A new unit was also created in the Ministry of Labor to verify labor law compliance in the maquila sector. The Ministry now provides free legal advice to trade unions and workers seeking to form new unions (CAFTA Facts, 2005).

Honduras

In response to the ILO labor law study, the Honduran Government convened a high-level tripartite (labor, management, government) consultation group to analyze the report and recommend a significant revision of the labor code. (The other CAFTA signatories undertook labor law reforms within the last decade, with assistance from the ILO.) Action was taken to address several issues.

The judicial system has expedited the backlog of labor cases, some of which dated to the mid-1990s. By 2005, the duration of a labor case was cut in half, ranging from eight to 22 months (The Labor Dimension in Central America and the Dominican Republic, 2005). In 2003 the government issued a regulation

specifying the obligation of employers to grant access to labor inspectors and fining noncompliant employers. The government also opened more regional offices to make ministry services more accessible, including a labor inspections office dedicated to working conditions in enterprise zones (EPZs) (CAFTA Facts, 2005).

Nicaragua

Despite severe resource constraints, the Nicaraguan Government has undertaken several efforts to improve the protection of labor standards. In response to the ILO labor law study of 2003, the government amended the regulations on trade union organizations and removed the requirement that elected union leaders be Nicaraguan citizens. As part of this reform, Decree No. 93-2004 was issued to allow unions to establish in their bylaws the causes for dismissal of union members. This decree also allowed federations and confederations to participate in any procedures to resolve labor disputes, including strikes.

The government reformed civil service protections for labor inspectors inJune 2004; their tenures were no longer jeopardized by political changes in administrations. Experienced inspectors can now build on expertise as they assist those with less experience. A new special labor prosecutor also was established to provide legal representation to the Labor Ministry when pursuing labor code violations. The ministry now has authority to ensure compliance with fines, previously flouted with impunity. Additionally, the courts issued an important ruling that protects union leaders from dismissal. When a court ordered reinstatement, previously employers could instead pay back wages and severance. The court has ruled that this option cannot be applied to union leaders, who must be reinstated with back pay.

In 2004, the World Bank approved a $70 million Poverty Reduction Support Credit, "in recognition of the Nicaraguan administration's significant accomplishments in the fight against corruption, the restoration of economic discipline, and commitment to poverty reduction" (CAFTA Facts 2005).

Dominican Republic

The Dominican Department of Labor established a joint protocol among the union federations, employer federations, and the Association of Free Trade Zones, in which all parties commit to improve the enforcement of labor rights inFTZs. Aseriesof lawswas passedto addresstrafficking inpeople andunfair practices against the most vulnerable workers. These include: the Law against Trafficking in Persons and Alien Smuggling, which establishes penalties of 15-20 years imprisonment and a fine of 175 times the minimum wage for convictions; and the new Code for the Protection of Children and Adolescents, which criminalizes child prostitution and child pornography. Also, special prosecutors were appointed throughout the country to eliminate the child trafficking. New regulations were issued updating hazardous work orders for children younger than 18 years. A work permit program was instituted that allows Haitian laborers to work without risk of deportation and protects the payment of fair wages. The Dominican Association of Free Zones and the Government of Spain conducted an awareness campaign for workers and employers on the issue of pregnancy testing as a condition for employment. This included six workshops and informational materials (Working Group 2005).

Oman

On July 9, 2006, Oman issued a Royal Decree covering many of the commitments it made. According to its government, this decree canceled or superseded all provisions of the labor law that contravene or contradict its provisions. Among these important reforms are changes to the terms of reference for workers' organizations to "unions" (formerly "representative committee") and "federations" (formerly "main representative committee"). The decree—

1. Directs the Minister of Labor to issue regulations to allow for collective bargaining;
2. Prohibits dismissal of workers for union activity;
3. Allows for more than one union per workplace;
4. Prohibits dismissal for union activity and established tougher penaltiesf for employers who engaged in anti-union activity;
5. Guarantees the right to strike;
6. Guaranteesunionsandfederationstherightstopracticetheiractivitiesfreely and without interference from outside parties;
7. Prohibits dismissal for union activity and established penalties, including fines and imprisonment for depriving workers of their rights to carry out lawful union activities, and

8. Increases penalties, including fines and imprisonment, for child labor violations.

Conclusions

U.S. trade policy has a long history of incorporating labor concerns. Special trade preferences programs and regional agreements have been especially proactive in requiring U.S. trading partners to upgrade their labor laws and standards. They have also created mechanisms for dialogue, increased transparency, and open avenues for more effective enforcement and dispute resolution by parties inside and outside the countries.

GSP alone reaches approximately 140 countries. These measures are helpful only if there is implementation and application. As the Jordan case highlights, this is an evolutionary process that depends heavily on determined monitoring. Trade agreements setting forth measures to improve workers conditions have not answered all concerns. More research is needed to gauge real progress. At this point, it can be said only that measures that could lead to real labor reforms in partner countries are being promulgated.

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The Rise of the Flash Memory Market: Its Impact on Firm Behavior and Global Semiconductor Trade Patterns

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Abstract

This article addresses three questions about the flash memory market. First, will the growth of the flash memory market be a short- or long-term phenomenon? Second, will the growth of the flash memory market prompt changes in firm behavior and industry structure? Third, what are the implications for global semiconductor trade patterns of flash memory market growth? The analysis concludes that flash memory market growth is a long-term phenomenon to which producers have responded in four distinct ways. It also concludes that the rise in flash memory demand has intensified current semiconductor trade patterns but has not shifted them fundamentally.

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Introduction

The past few years have witnessed rapid growth in a particular segment of the semiconductor market known as flash memory.[2] In each of the past five years, for example, flash memory market growth has either outpaced or equaled that of the total integrated circuit (IC) market[3] (McClean et al 2004-2007, section 5). One observer expects flash memory to have the third-strongest market growth rate over the next six years among all IC product categories (McClean et al 2007, 5-6). As a result, the flash memory share of the total IC market has increased from 5.5 percent in 2002, to 8.1 percent in 2005. As a share of the memory market segment, flash memory has increased from 28.7 percent to 38.2 percent during the same period. In short, the flash memory market has quickly become a significant part of the overall semiconductor market that cannot be ignored; some predict it will soon compete with the dynamic random access memory (DRAM) market for dominance within the memory sector in the not-too-distant future (McClean et al 2007, 5-4).[4]

Given its market size and projected growth, flash memory is likely to have an increased impact on the global semiconductor industry, and the decisions that flash memory producers make are likely to have a significant influence on industry evolution. These decisions have already been as dynamic as the recent performance of the flash memory market. Some firms have shifted production from other products to flash memory. In addition, some other firms have partnered to gain flash memory market share. Also, some firms have aggressively moved to lock in long-term deals with certain flash memory consumers.

This article will address three questions about the flash memory market. First, will the growth of the flash memory market be a short- or long-term phenomenon? Second, will the growth of the flash memory market prompt

[2] Flash memory is a type of nonvolatile memory that can be electrically erased and reprogrammed. Nonvolatile memory is memory that retains data when the power is turned off. Flash memory costs less and includes more functionality than other forms of nonvolatile memory.

[3] The semiconductor market is composed of two main subsets, the integrated circuit (IC) market and the optoelectronics, sensors, and discretes (O-S-D) market. The IC segment of the semiconductor market is by far the biggest (85 percent in 2006) and comprises semiconductors that are harder to manufacture, more advanced, and more expensive. Flash memory is a type of IC.

[4] DRAM is a popular type of volatile memory used mainly in computers. Compared to nonvolatile memory, volatile memory loses data when powered down. DRAM composes the largest share of the memory market, though flash memory has eroded its lead in recent years.

changes in firm behavior and industry structure? Third, what are the implications for global semiconductor trade patterns of flash memory market growth?

The analysis concludes that (1) flash memory market growth is a long-term phenomenon; (2) flash memory producers have responded to flash memory market growth in four distinct ways: choosing to produce flash memory rather than nonvolatile memory, entering into flash memory production, increasing flash memory production and production capacity, and partnering with each other; and (3) increased demand for flash memory and the response of producers to meet this demand have intensified current semiconductor trade patterns but has not shifted them fundamentally.

Flash Memory To Endure

The semiconductor industry has experienced many changes since flash memory first appeared in the early 1980s, one of the most dramatic and long-term of which has been the rise of the consumer electronics market as a demand driver for semiconductors. This rise in the consumer electronics market has fueled flash memory market growth and helped to make flash memory a prominent segment within the semiconductor industry.

Broadly speaking, flash memory ideally suits the consumer electronics market, because it bestows upon electronic devices two qualities that the market demands: mobility and miniaturization. For example, cell phones, a major application for flash memory, require data storage to save and store frequently called numbers and perform other convenient functions for which a traditional hard drive would prove impractical; such information would be erased every time the phone were turned off. Because (1) flash memory is small, reliable, and (2) its memory is nonvolatile, numerous applications not practicable with traditional data storage technology are emerging. Flash memory brings mobility and miniaturization to electronics products, two defining features of most consumer electronics products today.

Given capabilities and attractiveness of flash memory to the consumer market, it is clear why demand for it has rapidly grown. Flash memory allowed existing electronic products to adopt mobile and miniature qualities they did not have before and thus opened them up to new and very large consumer markets. In addition to cell phones, USB flash memory drives function as portable and smaller floppy drives. Flash memory has also prompted the growth of new consumer applications. Flash memory is an important component in popular devices such as DVD players, digital cameras, MP3 players, personal digital assistants (PDAs), and global positioning systems (GPS), all of which could not function without flash memory (McClean et al 2004, 7-2, and 2005, 7-3).

Origins and Early Growth

When flash memory first appeared in the early 1980s, most industry observers hardly took note. The few that did most likely would not have predicted then that the flash memory market would become a major segment of the global semiconductor market (box 1). Once flash memory fully emerged in the early 1990s, the initial industry consensus was that it had growth potential, but certain concerns made its growth trajectory uncertain. First, which markets would drive flash memory market growth? Second, how would flash memory compete against other types of nonvolatile memory technologies? Third, given its high price, how long would sluggish early sales continue?

Box 1 Fujio Masuoka, the Inventor of Flash Memory

The first flash memory device was invented in 1981 by a midlevel factory manager at Toshiba Corp. (Toshiba) named Fujio Masuoka. Masuoka wanted to create a device that would retain its memory after having been powered down. Up until then the main type of memory that existed was volatile memory such as DRAM, which lost its memory when the device was powered down. For example, any data created on a personal computer (PC) using such memory had to be saved to the PC's hard disk drive. Masuoka sought to create a chip that improved upon DRAM and hard disk drives. According to Masuoka,

> "Simply put, I wanted to make a chip that would one day replace all other memory technologies on the market. In the 1980s, the market for data storage on PCs was dominated by magnetic tape and disk drives0.Going after [the memory storage] market was the obvious thing to do for me..."

The industry was initially slow to recognize Masuoka's invention and realize its potential. It was not until 1985, four years after patent filing, that the industry was introduced to the device at a conference, and some firms realized flash memory potential. Intel asked for a sample of the new chip and in 1987-88 announced mass production of its own version of flash memory. Soon thereafter, Toshiba began mass production of flash memory.

Source: *Business Week* 2006a and 2006b.

These concerns proved to be unfounded as the flash memory market began to grow in the early 1990s (table 1). First, the most significant factor in flash memory growth was the emergence of the portable and laptop PC market as a growth driver. Flash memory provided the proper benefits of size, power dissipation, reliability, and speed for this expanding market (ICE 1992, 6-48).

The demand for flash memory created by portable and laptop PCs in the early 1990s hinted at a long-term trend within the semiconductor industry that would fuel flash memory market growth: the emergence of the consumer electronics market as the primary driver of end-use demand in the semiconductor industry. Second, within the nonvolatile memory sector, flash memory competed primarily against two other technologies called EPROM and EEPROM. In terms of price and functionality, flash memory fell somewhere in between these two technologies, effectively competing for space at the start of the 1990s (ICE 1992, 6-47). Third, regarding prices, in 1992 flash memory demand received a boost when Intel, the leader in flash memory production at the time, effectively lowered flash memory price-per-megabit ratio (ICE 1992, 6-49). Understanding the future demand for flash memory, Intel decided in 1991 to focus its nonvolatile memory production on flash memory and away from EPROM (ICE 1992, 6-49).

TABLE 1 The Rise of the Flash Memory Market

	Flash memory market (USD Million)	Flash memory market annual percentage growth	Flash memory as percentage of total semiconductor market	Flash memory as percentage of total memory market
1990	35		0.1	0.3
1991	135	286	0.3	1.0
1992	270	130	0.5	1.8
1993	640	106	0.8	3.0
1994	865	35	0.9	2.7
1995	1,860	115	1.3	3.5
1996	2,611	40	2.0	7.2
1997	2,702	3	2.0	9.2
1998	2,493	-8	2.0	10.8
1999	4,561	83	3.1	14.1
2000	10,637	133	5.2	21.6
2001	7,595	-29	5.5	30.5
2002	7,767	2	5.5	28.7
2003	11,739	51	7.1	36.1
2004	15,611	33	7.3	33.1
2005	18,569	19	8.2	38.3
2006	20,275	9	8.1	34.4

Source: WSTS and IC Insights.

End-use Demand

Scholars have noted that shifts in semiconductor end-use demand have historically fueled the growth and specialization of certain types of semiconductors, thereby benefiting firms or regions or both that specialized in their production (Langlois and Steinmueller 1999, 68). The birth of the semiconductor industry in the United States in the 1950s was fueled by U.S. military demand for high-performance semiconductors. The growth of the PC industry in the late 1980s and early 1990s spurred demand for microprocessors (Langlois and Steinmueller 1999, 23 and 52).

Since the mid-1990s the importance of the consumer electronics market as a source of end-use demand has grown dramatically, and it is predicted to increase. In 1993, consumer markets accounted for a little over 20 percent of the overall semiconductor market (Gartner Dataquest 2004, Tully). Corporate and military demand were the primary market drivers of the semiconductor industry then, and historically in the United States these and other sources had always accounted for a much greater share of semiconductor end-use demand than the consumer market (Langlois and Steinmueller 1999, 37). However, since 1993 the consumer electronics market has increased its share of the overall semiconductor market, leading one market research firm to predict that by 2013, consumer markets will account for more than 50 percent of the overall semiconductor market, roughly a 30 percent increase in the share of the semiconductor market in 20 years (Gartner Dataquest 2004, Tully).

Therefore, flash memory has quickly become an integral component in an end market of growing and sustained significance to the semiconductor industry. The question is how long will its importance last? Is flash memory growth truly a long-term phenomenon? If the prediction is correct that the consumer market will account for over 50 percent of the semiconductor market by 2013, then it is highly likely flash memory demand will continue to grow.[5]

Changes in Firm Behavior and Industry Structure

Semiconductor producers have devised various strategies to meet the increased demand for flash memory and obtain market share. At the beginning of flash

[5] Alternative nonvolatile memory solutions exist and could potentially challenge flash memory, though industry experts believe that these alternatives will not be widely used for many years. Such alternatives include FeRAM, NVRAM, PRAM, and C-RAM. *IC Insights* 2007, 7-15 and 7-16; and industry official, phone interview by Commission staff, April 18, 2007.

memory growth, producers of flash memory had to decide whether to switch production from other nonvolatile devices to flash memory. When flash memory growth exploded in the late 1990s, existing firms increased production and firms producing nonflash memory began production. More recently, firms have partnered to gain a leg up on the competition. The following describes these four firm behaviors and considers their impact on the semiconductor industry.

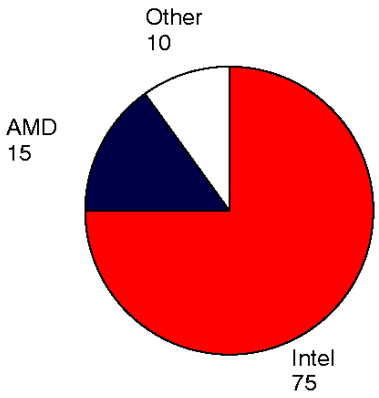
Which Nonvolatile Memory To Produce?

For firms producing nonvolatile memory in the early 1990s, uncertainty existed over which nonvolatile memory technology would take off—flash memory, EEPROM, or EPROM—thus making the decision to produce flash memory difficult. In addition, with flash memory accounting for less than 1 percent of the memory market in 1990, many firms had more immediate priorities than to focus on a technology with little demand. Decisions to produce flash memory fell into three general categories: (1) all in, (2) partially in, and (3) all out. Intel was one of the only nonvolatile memory producers that decided to go "all in" to flash memory production. In 1991, the company made the strategic decision to shift focus from EPROM to flash memory (ICE 1992, 6-49). More firms decided on the "partially in" strategy. Some were motivated by Intel's announced pull out of EPROM production to stay in that market (for example, AMD, SGS-Thomson, Fujitsu, and Texas Instruments), but they also wanted to maintain some flash memory production, especially at higher densities where some believed flash memory was superior to EPROM in terms of its functionality/cost ratio (ICE 1992, 6-49). Finally, some firms were unable to compete in the flash memory market and exited the market, such as Seeq Technology (ICE 1992, 6-49).

Intel's leap into the flash memory market proved critical in a technology that would soon dominate the nonvolatile memory market. By 1992, Intel had captured 75 percent market share of the flash memory market (figure 1) (ICE 1993, 6-52). Once it was obvious that flash memory would be the dominant nonvolatile memory technology, many of the firms "partially in" to flash memory production changed strategies and increased production or jumped into an "all in" strategy. In 1995, AMD, Fujitsu, Atmel, and SGS-Thomson followed this strategy, reclaiming flash memory market share from Intel, which saw its share of the market drop to 42 percent (figure 1) (ICE 1996, 8-20).

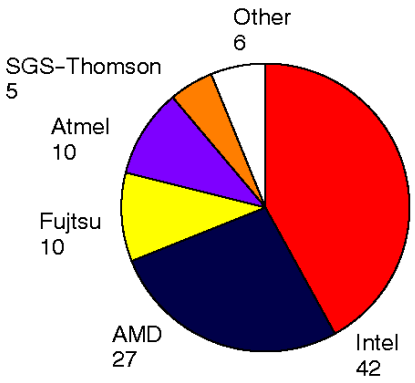
Figure 1 Changing Flash Memory Market Share, selected years *(percentage)*

Flash Memory Market Share, 1992 ($310 million)



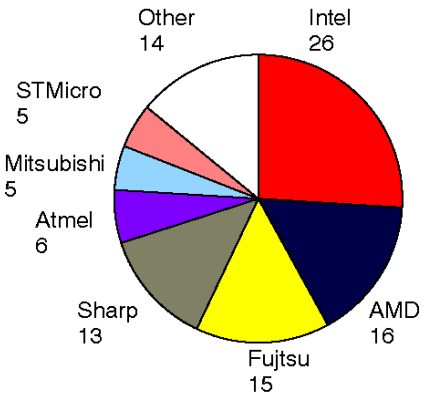
Source: ICE.

Flash Memory Market Share, 1995 ($1.9 billion)



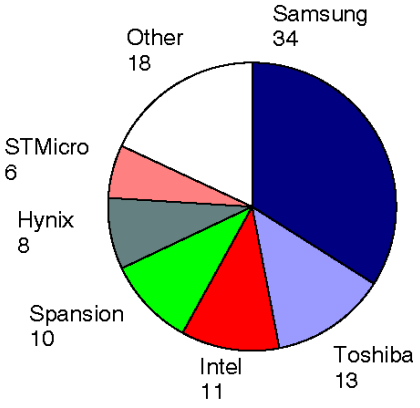
Source: ICE.

Flash Memory Market Share, 1999 ($4.7 billion)



Source: ICE.

Flash Memory Market Share, 2005 ($20.5 billion)



Source: Web-Feet Research.

New Producers Entering Market

The fragmentation of the flash memory industry continued in the late 1990s, as a small number of existing flash memory producers struggled to satisfy the increasing demand for flash memory. Seeing the opportunity to enter a growing market, other semiconductor firms (e.g. Samsung, Toshiba-SanDisk) commenced flash memory production. Thus, the number of flash memory producers went from less than 15 in 1995 to at least 28 in 2005 (ICE 1996, 8-22 and Web-Feet Research 2006, Niebel).

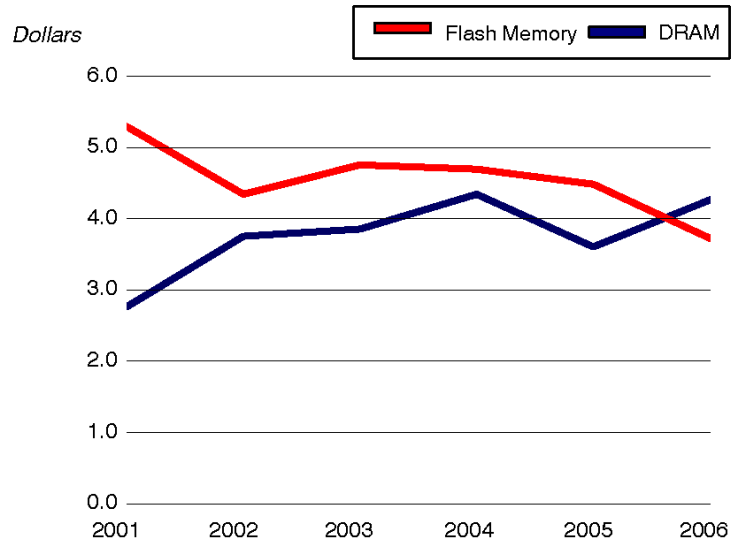
The entrance of new producers has had several effects on the industry. Besides initially helping to supply the exploding demand for flash memory at the end of 1998 and 1999 (though their presence and the increased production of existing producers still did not fully satisfy demand in 1999) and helping to lower Intel's market share from 42 percent in 1995 to 26 percent in 1999 (ICE 1996, 8-20, and 2000, 68), the biggest effect of new flash memory producers has been the disruption of supply-demand balances in the flash memory and DRAM markets. This is because the recent entrants have included a host of DRAM producers who have shifted portions of their DRAM capacity to flash memory, in particular the ever popular NAND flash.[6] Many DRAM producers were lured by the higher average selling price of flash memory from 2001-2005 (figure 2) and the saturation of the DRAM market. For example, Samsung, which is the world's leading supplier of both DRAM and flash memory, has accelerated production of flash memory and delayed its DRAM expansion plans (McClean et al 2006, 7-17).

Ironically, DRAM producers' entrance into flash memory production has actually contributed to defeating their original purpose for entering: flash memory's average selling price dropped below that of DRAM in 2006 due to oversupply and currently DRAM is more profitable (figure 2). It is uncertain if these short-term supply-demand imbalances in flash memory and DRAM will continue (LaPedus and McGrath, 2007) and if producers will continue to shuffle their production in search of higher average selling prices.

Estimating proper supply for the flash memory market is complicated by the unpredictable nature of flash memory demand – it is unclear what consumers will deem the next great gadget to drive the market, and when it will appear.

[6] NAND is a flash memory architecture that provides fast write speeds, a useful feature for storing large amounts of data (often used for digital photos, MP3 files, and other multimedia applications). The other type of popular flash memory architecture is NOR, which provides fast read speeds, a useful feature for quickly pulling data out of memory (cell phones are a major application). Currently, almost all flash memory is based on either NAND or NOR architectures.

Figure 2 Flash memory and DRAM average selling prices



	2001	2002	2003	2004	2005	2006
Flash Memory	5.29	4.34	4.75	4.69	4.48	3.72
DRAM	2.76	3.75	3.85	4.34	3.60	4.26

Source: IC Insights.

One bright note in this supply-demand challenge is that a chronic oversupply or undersupply situation for either flash memory or DRAM is less likely given that now a small group of producers exists that are skilled in switching between flash memory and DRAM production.

Flash Memory Producers Increasing Production and Production Capacity

From 1991 to 2006, the flash memory market grew by 63 percent a year (calculated from various ICE and IC Insights reports) and grew from one-quarter of one percent to over 8 percent of the overall semiconductor market during this period (calculated from various ICE and IC Insights reports). Between 1995 and 2006 capital spending on flash memory grew from 3 percent to 20 percent of overall semiconductor capital spending (McClean et al 2007, 4-15 to 4-16). Because of the long-term growth forecast of flash memory,

positive current producers are likely to continue increasing production and production capacity.

Producers use four primary methods to increase flash memory production and production capacity. One of the fundamental methods firms use to increase production is transitioning to smaller production process geometries. Semiconductors are produced in batches on silicon wafers. Switching to smaller production process geometries allows firms to produce more chips per wafer, thus increasing chip production. Second, firms can increase their flash memory production by shifting existing chip production capacity from other chip production to flash memory production.[7] Shifting existing production capacity allows firms to produce flash memory relatively quickly and cheaply. Recently, one firm has shifted existing production capacity from DRAM to flash memory in months instead of years and for millions of dollars instead of the billions of dollars required to build a new state-of-the-art semiconductor fabrication facility (McClean et al 2007, 8-15).[8] A third option for increasing production is to buy existing semiconductor facilities when available and convert them to flash memory production. Finally, for those firms that have the financial resources, building new flash memory capacity from the ground up is an option, albeit a very expensive and high-risk venture.

These methods of increasing production require different amounts of spending, and it is significant that flash memory producers have used the most costly method of increasing production. Flash memory producers have increased their production *capacity*, which is a strong indication they believe flash memory is a long-term phenomenon; they would not make such an investment otherwise.

Indeed, a clear distinction in spending exists in the semiconductor industry between increasing production and increasing production capacity. Increasing production through R&D investment is a necessary reality in the semiconductor industry. Firms constantly attempt to increase production by increasing the number of good die per wafer, increasing the number of wafers processed per month, and shrinking the size of the die on wafers. The average R&D spending of a semiconductor firm as a percentage of sales is usually between 10 and 20 percent. In 2006 the average was 15.5 percent (McClean et al 2007, 16-5). Though this investment in production is costly,[9] increasing production capacity, by converting existing capacity, buying existing capacity, or building new capacity, is more costly. In 2006, the majority of semiconductor firms invested less than $1 billion in R&D (McClean et al 2007, 16-5). By contrast, the

[7] Samsung, a major producer of DRAM, employed this strategy during the late 1990s to enter the flash memory market. *IC Insights* 2000, 66.

[8] In 2006, the construction of a new state-of-the-art semiconductor fabrication facility was estimated at $2.5 billion. *IC Insights* 2007, 16-6.

[9] The only industry that spends more on R&D as a percentage of sales is the biotechnology industry. *IC Insights* 2007, 16-3.

construction of a new state-of-the-art semiconductor fabrication facility in 2006 cost an estimated $2.5 billion.

It is possible, however, that a continual increase in flash memory production capacity may lead to chronic oversupply as evidenced by the decline in flash memory average selling price in 2006. Downward pricing pressure may lead to competitor consolidation. Historical lessons from the DRAM industry, where regular overspending led to downward pricing pressures and consolidation, are a case in point (McClean et al 2007, 4-15). The nature of end-use demand for flash memory, however, is different than it was for DRAMS when overspending occurred. The future strength and stability of the flash memory market depends largely on development of new and diverse sources of demand from the consumer market coupled with producer sensitivity to creating overcapacity.

Flash Memory Producers Partner

Firms have also sought to increase their share of the growing flash memory market through partnerships (box 2). Partnering has emerged as a way for firms to rapidly increase production without heavily investing in new fabrication facility construction.[10] It has also permitted firms to share R&D and manufacturing resources for mutual advantage in joint technology development, allowing both partners to become more competitive. Intel and Micron created IM Flash Technology to combine "Micron's expertise in developing NAND technology and operating highly efficient manufacturing facilities with Intel's multi-level cell technology and history of innovation in the flash memory business..." and to bring together "the manufacturing technology, assets, experience and scale necessary for Intel and Micron to successfully compete in the NAND flash memory business...." (Intel and Micron, joint press release, November 21, 2005).

Thus far, partnering has occurred between relatively equally matched firms looking to combine resources to gain market share in a rapidly growing market. If supply consistently exceeds demand, the nature of partnering may change to where stronger firms take over struggling firms. However, since most flash memory producers manufacture other semiconductors, the fall in prices for flash memory, even if persistent, will not lead quickly to consolidation.

[10] One industry expert estimates that a quarter to a third of current flash memory production comes from partnered firms. Industry official, phone interview by Commission staff, April 18, 2007.

Box 2 Major Partnerships among Flash Memory Producers

IM Flash Technologies (IMFT) – joint venture between Intel and Micron

- Began operations on January 6, 2006 to manufacture NAND flash memory for the exclusive benefit of its partners.
- Key elements: Intel owns a 49 percent interest while Micron owns 51 percent; companies share output generally in proportion to their investment; costs for product and process development are generally split evenly; product design and other research and development costs are shared equally. Micron contributed land and facilities in Lehi, Utah, a fully paid lease of a portion of its manufacturing facility in Manassas, Virginia, a wafer supply agreement to be supported by its operations located in Boise, Idaho, and $250 million in cash. Intel contributed $1.196 billion in cash and notes.

Hynix and STMicroelectronics – joint venture in China

- Signed and announced a joint venture agreement in 2004 to build a front-end memory manufacturing facility in Wuxi City, China. Construction began in 2005. The fab will employ roughly 1,500 people and will feature a 200-mm wafer production line planned to begin production at the end of 2006 and a 300-mm wafer production line planned to begin production in 2007. Total investment planned for the project is $2 billion. STMicroelectronics will contribute 33 percent of the equity financing, while Hynix will contribute 67 percent.

Flash Partners and FlashVision – joint ventures between Toshiba and SanDisk

- Flash Partners formed in September 2004.
- Key elements: SanDisk owns 49.9 percent while Toshiba owns 50.1 percent; purchases wafers from Toshiba and sells wafers to SanDisk and Toshiba at a price equal to manufacturing cost plus a markup; Toshiba operates its Fab 3 in Japan, and SanDisk has employees assigned to work there; each firm is committed to take 50 percent of Flash Partners' wafer output.
- FlashVision formed in April 2002. Firms agreed to consolidate the NAND wafer fabrication manufacturing operations in Toshiba's Fabs 1 and 2 in Japan.
- Key elements: SanDisk owns 49.9 percent while Toshiba owns 50.1 percent; each company is committed to take 50 percent of FlashVision's wafer output; each firm has a design and development team associated with FlashVision with each paying the cost of its design teams and 50 percent of the wafer processing and similar costs associated with this direct design of the flash memory.

Spansion – joint venture between AMD and Fujitsu

- Formed in 2003 as a manufacturing venture between AMD and Fujitsu.
- Key elements: provides flash memory to AMD and Fujitsu, who resell it to customers; for fiscal 2005, AMD accounted for approximately 56 percent of Spansion's net sales, and Fujitsu accounted for approximately 44 percent; currently, Spansion sells directly to customers previously served by AMD and continues relationship with Fujitsu.

Source: Company annual reports and 10K and 20F filings to the SEC.

Impact on Semiconductor Trade Patterns

Firm and industry changes due to the rise of the flash memory market have intensified current semiconductor trade patterns but has not shifted them fundamentally. Despite the rise in the flash memory market, major importers and exporters of semiconductors (HS 8542) have remained remarkably stable.[11] From 2002-2006, the top 10 semiconductor importers remained constant, and very little change occurred in the top 10 semiconductor exporters (Global Trade Atlas).[12] The following section describes the nature of the change to global semiconductor trade patterns and briefly analyzes possible implications of this outcome.

Changes in Current Semiconductor Trade Patterns

Within the semiconductor industry major trade shifts usually occur when changes develop in one or more of the following three variables: the structure of the semiconductor manufacturing process, the location of front-end chip production, and/or the location of the semiconductor market. Increased flash memory production has not significantly changed these three variables and hence has not shifted current semiconductor trade patterns.

Structure of the Semiconductor-Manufacturing Process

Most semiconductor-manufacturing includes two distinct production processes: the highly capital-intensive front-end fabrication process and the less capital-intensive (though still highly automated) back-end assembly and test process.[13] Historically, firms have physically separated these processes, with the front end taking place in the firm's home country, usually the United States, the EU, or Asia (predominantly Japan), while the back end has occurred mostly in Southeast Asia. Firm response to flash memory market growth has not significantly altered this production process model. By and large, flash memory producers have increased production capacity through construction or conversion of facilities in their own countries while also maintaining back end

[11] Data on flash memory trade patterns is unavailable, because virtually no country breaks down its trade data by flash memory. Only South Korea maintains a subheading in its tariff schedule specifically for flash memory. For most countries flash memory trade data is aggregated into broader semiconductor groupings in their tariff schedules.

[12] Yearly changes in position *among* the top 10 semiconductor importers and exporters did occur from 2002-2006.

[13] Front-end semiconductor processing is the stage of manufacturing in which semiconductors are formed. To reduce semiconductor defects, this process takes place in ultraclean environments known as cleanrooms. Once semiconductors are formed, back-end processing begins in which semiconductors are assembled, tested, and packaged for final sale.

production in their usual locations, mainly in Southeast Asia. Therefore, the increase in flash memory production has actually taken place within the predominant production model, thus perpetuating it and the trade patterns it creates (box 3).

It is unlikely that flash memory producers would switch to an alternative production model that would shift trade patterns. The most viable scenario is one in which flash memory producers outsource production to semiconductor

Box 3 Selected Flash Memory Firms' Plant Locations

With a few exceptions, firms' recent efforts to increase flash memory production capacity show that it is taking place in the usual areas for front-end fab construction (i.e. the United States, the EU, and Japan), thus reinforcing trade patterns.

Current plant locations of significant flash memory firms

Company	Flash memory fabrication locations
Samsung	South Korea
Toshiba/SanDisk	Japan
IMFT	United States
Micron	Italy
Spansion	United States and Japan
Hynix	South Korea
STMicro	Italy, France and Singapore
Qimonda	Germany
Hynix/STMicro joint venture	China
Powership	Taiwan

Source: Company annual reports, 10K and 20F filings to the SEC, and the McClean Report. 2007 ed.

Note: Intel, which is a major producer of NOR flash memory, has fabrication facilities in the United States, Ireland, and Israel, but it is unclear which of those three locations is a source of flash memory production.

Two companies bear watching because they buck the location trends of most flash producers: Powership of Taiwan plans to open new flash memory capacity in Taiwan in 2007, and Hynix's and STMicro's joint venture to construct a flash memory fabrication plant in Wuxi, China should be in full operation in 2007.

Back-end production location specifically for flash memory is harder to pinpoint, though most of the companies listed have back end facilities in Southeast Asia as well as in their home countries (many firms also contract out back end work to firms that are predominantly located in Southeast Asia).

pure-play foundries.[14] The majority of pure-play foundry production capacity is in Taiwan, Singapore, and China. Pure-play foundries in these three countries accounted for more than 80 percent of the worldwide pure-play foundry market in 2006 (McClean et al 2007, 3-23). Any significant or measurable switch to pure-play foundries for flash memory production would shift trade patterns, as front-end production would likely move from the United States, South Korea, and Japan to those three countries.

This scenario is unlikely, however, because the flash memory market continues to grow. First, the majority of foundry production is of chips designed by "fabless" semiconductor companies that do not own production facilities. The overwhelming majority of flash memory producers, in fact, own their own production facilities, thus limiting their need for foundry services. Second, memory producers have been using foundry services less and less in recent years (17 percent in 2001 to 5 percent in 2005) (McClean et al 2006, 3-30), and this trend is likely to continue.

The Location of Front-end Semiconductor Production

Regarding front-end production, several scenarios exist outside the context of the manufacturing process that could shift global trade patterns.

One scenario is for flash memory producers to relocate front-end production closer to their principal end market, China. In 2005, China became the largest single country market for integrated circuits, which includes flash memory, due to the increasing concentration of electronic system production in that country (McClean et al 2006, 2-50 to 2-54). Under this scenario, semiconductor producers, including flash memory producers, would benefit from proximity to their largest market, significantly altering current industry trade patterns.

Though some back-end production has shifted to China from other Asian countries, front-end production has remained outside of China, primarily because firms maintain concerns over intellectual property rights (IPR) protection and enforcement in China. China's weak IPR protection and enforcement is recognized by the U.S. Government and U.S. industry. In its 2005 "Special 301" out-of-cycle review of China's implementation of its intellectual property (IP) protection commitments, the Office of the United States Trade Representative (USTR) determined that IP infringement was "unacceptably high" and that China's inadequate IPR enforcement was

[14] Pure-play foundries are semiconductor companies that fabricate semiconductors only. Foundries provide services to "fabless semiconductor companies that only design semiconductors, and to integrated device manufacturers (IDMs) that often outsource production to foundries, especially during business upturns when IDMs may not have sufficient production capacity to meet demand. The pure-play foundry model was pioneered in Taiwan in the late 1980s and has become a very popular production model.

"resulting in infringement levels at 90 percent or above for virtually every form of intellectual property." (USTR 2005, 2). Consequently, USTR elevated China to its "Priority Watch List" as a country that does not provide an adequate level of IPR protection and enforcement where it remains to date. The U.S. semiconductor industry has also voiced concerns over China's lack of IPR protection and enforcement. The Semiconductor Industry Association (SIA) listed improving intellectual property protection in China as a major priority in its 2005 annual Report (SIA 2005, 30-31), and in its comments to USTR for the 2005 National Trade Estimate Report on Foreign Trade Barriers, SIA wrote, "China has the substantive intellectual property laws required under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), but enforcement remains an issue" (SIA 2004, 3). Because a significant portion of the value of semiconductor firms rests in their intellectual property, they must guard it vigilantly. Until China's IPR protection and enforcement environment improves, many semiconductor firms will likely remain wary of relocating front-end production facilities there.

Another scenario that could alter trade patterns involves Chinese manufacturers independently designing and producing flash memory. However, while they have made strides in developing semiconductor production technical capabilities, China-based manufacturers are still many years away from being competitive, particularly for flash memory, which embodies the newest process technologies for semiconductors. In 2006, total China-based IC production accounted for less than 2 percent of total worldwide IC production (McClean et al 2007, 1-1). To put this into perspective, each of the top 21 IC producers in 2006 produced more than all China-based IC producers *combined*, and production of the world's leading IC producer, Intel, was more than *10 times* that of all China-based IC producers (McClean et al 2007, 2-49 and 3-8). Even given the Chinese Government's ambitious plans for its domestic semiconductor industry, future production is estimated to remain a very small fraction of total IC production. China's 10th Five-Year Plan calls for domestic semiconductor production to reach $24 billion by 2010 (USTR 2006, 98). If this goal were achieved, China's total domestic semiconductor production would only be able to supply less than 15 percent of the estimated total semiconductor market in 2010 (McClean et al 2007, 2-13).[15]

[15] Since flash memory falls under the subset of semiconductors known as integrated circuits (ICs), a more realistic calculation of China's ability to produce flash memory is its share of total IC production, which is predicted by IC Insights to be less than 3 percent by 2011 (McClean et al 2007, 2-49). The difference between China's share of total semiconductor production and China's share of total IC production includes production of optoelectronics, sensors, and discretes (O-S-D), which are semiconductors that are easier to produce, have much less functionality, and have a much lower average selling price than ICs.

The location of the flash memory market

China is the world's leading semiconductor market and continues to grow as such. Since 2002 China has also been the world's leading annual destination of imports of electronic integrated circuits, HS heading 8542 (Global Trade Atlas).[16] Given flash memory's use in consumer goods, which are manufactured/assembled almost exclusively in China, China looks to continue to be the final destination of flash memory for a long time. Hence, increased flash memory production will perpetuate foreign flash memory exports to China. Flash memory exports to China from two of the world's leading flash memory producing countries, the United States and South Korea, have been strong in recent years. In 2006, China was the leading destination for U.S. exports of nonvolatile EEPROM memory (of which flash memory is the biggest part), and China and Hong Kong combined to be the leading destination for South Korean exports of flash memory.[17]

Conclusion

The growth of flash memory has had a supportive, not disruptive, effect on current semiconductor trade patterns. Producers have scrambled to meet explosive demand for flash memory within, not outside, the context of the prevailing production model, thus helping to maintain existing trade patterns and increasing trade flows within these patterns. China remains the largest market for flash memory, perpetuating overall consumption trends and trade patterns.

While flash memory has experienced phenomenal growth over the last 15 years, it still represents less than 10 percent of the overall semiconductor market. The ability of such a small portion of the market to shift overall semiconductor trade patterns, no matter how rapid its growth, is understandably limited.

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[16] HS 8542, electronic integrated circuits, is the HS code that most closely represents all semiconductors. Since ICs represent the biggest subset of semiconductors (approximately 85 percent in 2006), ICs are often used as a proxy for semiconductors. Also, flash memory is a subset of ICs, making it a subset also of semiconductors.

[17] Because Chinese import statistics categorize semiconductors by process technology instead of product type, it is necessary to examine other countries' export statistics to China to calculate flash memory trade flows to China. Further complicating matters are the facts that (1) of major semiconductor producing countries only South Korea maintains an export subheading for flash memory (the United States maintains a subheading that encompasses flash memory relatively tightly) and (2) the global nature of the semiconductormanufacturing process can distort countries' trade statistics.

However, the impact of flash memory on the semiconductor market and trade patterns will hinge on the sustainability of current high demand over the long term. Much uncertainty exists whether flash memory's influence will reinforce current semiconductor trade patterns or will eventually shift them. No matter how big the flash memory market grows, it is likely only to reinforce semiconductor trade patterns, not shift them. Shifts in semiconductor trade patterns are based on changes in three variables: the production process structure, the location of production, and the location of consumption, and thus far flash memory growth has demonstrated little direct influence on these variables.

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A "Calibrated Approach": Pharmaceutical FDI and the Evolution of Indian Patent Law

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Abstract

India has charted its own intellectual property (IP) path over the last 35 years, attempting to foster the growth of a domestic pharmaceutical industry and access to medicine while, more recently, also addressing the requirements of the international IP regime. Multinational companies (MNCs) have responded to India's movement towards compliance with the WTO intellectual property agreement, TRIPS, by increasing the quantity and quality of foreign direct investment (FDI) in the areas of pharmaceutical research and development (R&D) and manufacturing. By contrast, MNCs have adopted a more cautious attitude toward the patenting and commercialization of new pharmaceutical products in India, waiting to see how Indian courts and patent offices interpret the new laws, and awaiting the enactment of long-debated data protection legislation. The ultimate success of the Indian "calibrated approach" to fostering the domestic industry and access to medicine while also addressing international IP requirements remains to be seen.

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Introduction

This article traces the impact of India's changing patent laws on foreign direct investment (FDI) in the pharmaceutical sector. The patent laws of India have evolved from a model protective of pharmaceutical patents during the colonial period (1856–1947), to a legal regime intended to foster the establishment and growth of a domestic industry by excluding pharmaceuticals from patent protection (1972–2005), and finally to the present law (2005), which reestablishes patent protection for pharmaceutical products to comply with the requirements of the international intellectual property (IP) system.

The evolution of the patent law appears to have had a substantial impact on domestic and foreign pharmaceutical investment. Foreign firms dominated the market during the colonial period. By contrast, when there was no patent protection for pharmaceutical products, domestic firms flourished by reverse engineering patented products to make generic pharmaceuticals and the market share of foreign firms declined. Although it is still too early to define the impact of the 2005 change to the patent law, it appears to be motivating increased FDI in the Indian pharmaceutical sector. In anticipation of the new law, pharmaceutical FDI increased sharply in 2004, declined in 2005, and then rebounded (although not to 2004 levels) in 2006. The decline appears attributable to ongoing uncertainty as to how India will implement its new patent law, and whether it will enact long-debated protections for clinical test data submitted to regulatory authorities for the marketing approval of new products.

Over the last five years (2002-06), FDI and strategic alliances between foreign and domestic firms in the areas of clinical trials, data management services, new drug discovery, and the manufacturing of pharmaceuticals and ingredients all have been on the increase. The valuable intellectual property connected to these activities is protected through operational security procedures, contractual protections and due diligence to ensure trustworthy partners. Multinational companies (MNCs) conduct research and development (R&D) and manufacturing in India because of cost savings, the skilled labor force and the country's disease profile, among other reasons. These firms have, however, waited to see how the patent law is interpreted, and whether clinical test data will be protected, before substantially expanding their patenting and commercialization activities in India.

India is charting a new intellectual property path, attempting to foster access to medicine and the growth of the domestic pharmaceutical industry while also phasing in compliance with the requirements of the international IP system. The ultimate impact of this "calibrated approach" on the quantity and quality of FDI in the pharmaceutical sector remains to be seen.

Evolution of Indian Patent Laws

Patent Laws Under British Rule (1856-1947)

India enacted its first patent law in 1856 while the country was under British rule, a period that lasted until India's independence in 1947. While the patent laws were amended throughout the colonial period, they consistently provided for the patenting of pharmaceutical products. Most patents granted during this period went to foreigners. At the time of independence, India's pharmaceutical sector was dominated by MNCs with limited participation by domestic firms (Mueller 2007, 16-20).

Postindependence Patent Laws (1947-1995)

With independence in 1947, the Indian Government began preparing a new patent law, with a goal of fostering the development of an indigenous pharmaceutical industry. Preparations continued for 25 years. In 1972, after repeated expert reports and deliberations in Parliament, the India Patents Act of 1970 came into force (Mueller 2007, 22-25).

The 1970 Act imposed substantial limits on patent rights; these limits were intended to encourage indigenous inventions and secure their production in India on a commercial scale (India Patents Act 1970, § 83). First, and most importantly, pharmaceutical products could not be patented. Second, firms were permitted to patent only a single process for making a pharmaceutical; a firm could not block competitors by patenting all possible processes for making a drug. Third, the term for pharmaceutical process patents shortened to five years from the grant of the patent or seven years from application filing, whichever was less, compared to 14 years from application filing for all other inventions. And fourth, the Act imposed very broad "compulsory licensing" provisions for pharmaceutical process patents. Within three years of the grant, the patents were deemed "licenses of right," meaning that anyone could use the process if they paid a royalty (Chaudhuri 2005, 37-8). In sum, pharmaceutical products had no protection, and pharmaceutical processes were protected for only three years if a royalty were paid and five years if no royalty were paid.

Post-TRIPS Patent Laws (1995-Present)

In January of 1995, India became a founding member of the World Trade Organization (WTO) and agreed to the requirements of the WTO intellectual property agreement, Trade-Related Aspects of Intellectual Property Rights (TRIPS). Because India was a developing country and did not provide for pharmaceutical product patenting when TRIPS came into force, it obtained a 10-year transition period, until January 2005, to put in place pharmaceutical patent protections (TRIPS Art. 65.4). During this transition period, India was required to provide a means for applications to be filed and assigned a filing date, a "mailbox" facility. TRIPS also required that "exclusive marketing rights"—the sole right to sell an invention for a specified time—be provided for certain mailbox applications filed during the transition period (TRIPS, Arts. 70.8(a) and 70.9). India complied with these requirements through the Patents Act of 1999, after a WTO complaint was filed by the United States and resolved against India (WTO 1998).

In 2002, India amended its patent law to provide the TRIPS-mandated 20-year patent term for all inventions, to be applied to pharmaceutical patents at the conclusion of the transition period. The amendments also include new compulsory license provisions. These provisions permit a compulsory license application three years after a patent is granted if the "reasonable requirements of the public" regarding the invention have not been satisfied, the invention is not available at a reasonably affordable price, or the invention is not being "worked" or produced in India (India Patents Act 2005, §84).[2] The law also provides for immediate compulsory licensing in cases of a governmental notification of a public health crisis or public noncommercial use, or where the product will be exported to countries with insufficient manufacturing capacity to address public health problems (India Patents Act 2005, § 92-A). The compulsory license provisions of Indian law are, by far, the broadest of all the world patent systems (Mueller 2007, 107-9). As such, they raise substantial concerns among multinational pharmaceutical companies; to date, however, no compulsory licenses have been sought or issued under the new law.

The critical step in India's implementation of its TRIPS commitments came in January 2005 with the end of the transition period and the required amendment of its law to provide patent protection for pharmaceutical products. According to Indian industry and government representatives, India

[2] Domestic "working" requirements are controversial; the United States challenged at the WTO such a requirement in Brazil's patent law, however, the dispute was terminated based on Brazilian agreement to provide advance notice where it intended to issue a compulsory license based on the fact that the patent was not domestically worked (USTR 2006).

now is taking a "calibrated approach" to intellectual property protection that seeks to take into account concerns for public health, access to medicine and the interests of the domestic industry (U.S. India Business Council 2007; Reddy 2007, v). Notwithstanding this focus on domestic issues, India now has in place an IP regime that addresses the requirements of the international IP system.

Ongoing Patent Law Controversies

Despite the substantial patent law changes since Indian entry into the WTO, there are still gaps and provisions that raise objections from multinational pharmaceutical companies. First and foremost, MNCs seek a law to protect the clinical trial and other data used to obtain marketing approval of new pharmaceutical products. Second, they raise concerns about patenting standards and particularly the patent exclusion for derivative pharmaceutical products.

Data Protection

Drug regulators in most countries require the submission of safety and efficacy data before a pharmaceutical can be approved for marketing. This data can be extremely expensive to amass. The fully capitalized cost to develop a new drug reportedly averages more than $800 million, with much of the costs attributable to the conduct of clinical trials (DiMasi, Hansen and Grabowski 2003, 151).

TRIPS requires that such data be kept confidential and that it be protected against "unfair commercial use" (TRIPS Arts. 39.2 and 39.3). However, because TRIPS does not define the critical terms included in this requirement, the precise nature of the obligation arguably is unclear. The United States, the European Union, and many multinational pharmaceutical firms interpret TRIPS to require "data exclusivity," meaning that data submitted to a marketing authority cannot be relied upon as a basis for approving a generic drug for a particular period (ranging from five years in the United States to up to 10 years in European Union countries). Others note that some developing countries interpret TRIPS to protect test data only against misappropriation or other circumstances in which it is unfairly obtained (Thomas 2006, CRS-18).

The appropriate level of protection for test data has been intensely debated in India for years. Most recently, a Government Committee recommended a "calibrated approach" that would account for the minimum requirements envisaged by TRIPS and the national interest in access to medicine through promotion of the domestic generics industry. Under this approach,

pharmaceutical test data would receive only minimal protection during a transition period (of unspecified duration). Regulators could rely on the originating company's data to approve generic drugs but legal protections would be available for misappropriated data. After the transition period, five years of data exclusivity would be provided for pharmaceuticals with safeguards to ensure public health. Interestingly, the Committee also recommended that data submitted to regulators to obtain approval for traditional medicines (a sector dominated by domestic companies) receive five years of protection immediately, without any transition period (Reddy 2007, v). The Committee recognized that not providing data exclusivity for pharmaceuticals could adversely impact FDI and discourage the launch of new products in India (Reddy 2007, 32). Indeed, according to Pfizer India, the lack of data protection is part of the reason that "people are talking about India but investing in China" (KPMG 2006, 18).

Patent Exclusion for Derivatives

Another controversial aspect of India's Patent Act is the exclusion from patentability for derivatives of known substances, unless it can be shown that they are significantly more efficacious than the original substance (India Patents Act, §3(d)). This exclusion was meant to preclude "evergreening"—the practice of extending the terms of patents through related patents on modified forms of the same drug, new drug delivery systems or new uses (Mueller 2007, 72). The types of efficacy data needed to show that a derivative is patentable, the ability of patent examiners to evaluate medical efficacy data, and the standards governing the patent examiner's data evaluation are all unclear. The Government of India charged a Technical Expert Group with determining whether this exclusion from patentability was TRIPS compatible. The Expert Group issued an opinion in December 2006, concluding that it was not, but later withdrew it due to "technical inaccuracies" (Nair 2007). The multinational pharmaceutical firm Novartis is in the midst of a high-profile challenge to the legality of this exclusion (box 1).

The perceived inadequacies in Indian patent law described above, as well as the Novartis experience, appear to have impacted multinational pharmaceutical companies' evaluation of the investment environment in India. Novartis has stated that it constructed its new research institute in Singapore rather than India because of its concerns about patent protection. Also, Novartis has announced the creation of a Shanghai research institute because of its perception that, unlike India, China has a system in place to improve intellectual property protection. Because of intellectual property insecurity, the Novartis R&D collaborations in India reportedly are limited to supportive work rather than the development of new medicines (Business World India 2007).

Box 1 The Novartis Challenge to India's Patent Law

Novartis is challenging in the Indian courts the refusal of the patent office to grant a patent for its cancer drug, Glivec. The patent office found that Glivec was not patentable under Section 3(d) of the Patents Act, which requires that a new form of a known compound demonstrate improved efficacy, and also found that the drug did not satisfy the requirements for novelty and an inventive step. The Novartis case challenges the constitutional validity of the patent law and its TRIPS compatibility. The dispute is pending in the Madras High Court which, in April of 2007, referred part of the case to a newly constituted Intellectual Property Appellate Board.

Novartis asserts that this is not a case of evergreening. Although Glivec is patented around the world, the pre-2005 bar on product patents precluded Novartis from obtaining a patent in India. Novartis further alleges that it has demonstrated that the new version of the drug is more effective than a previous version, contrary to the findings of the patent office. NGOs and health advocates object to the Novartis challenge on the grounds that it undermines access to medicines and India's ability to place limits on the patenting of essential drugs.

Ironically, although Section 3(d) was intended to limit evergreening by MNCs, it also limits the ability of domestic firms to obtain patents for incremental innovations. Domestic firms are in the early stages of investing the large amounts of money and scientific expertise necessary to discover new drugs. Their patents have focused on manufacturing processes and incremental innovations. For example, the Indian firm Ranbaxy has reported that its patent applications in 2004 focused on process discoveries for generics. In 2007, its patent filings focused on new drug delivery systems and other incremental innovations. Ranbaxy anticipates it will not be in a position to seek patents for new drug discoveries until 2012.

By limiting the availability of patents for incremental innovation, Section 3(d) may have the opposite effect of that India intended. It may concentrate valuable pharmaceutical product patents in the hands of MNCs because they have access to the resources and expertise needed for the most complex and costly inventions, at the expense of domestic firms.

Sources: Novartis, "Questions and Answers"; and Technical Expert Group on Patent Law Issues, "Report of the Technical Expert Group on Patent Law Issues."

More generally, according to a survey conducted by Ernst & Young and the *Economist*, more than 62 percent of multinational pharmaceutical companies surveyed in India considers threats to intellectual property the most serious business risk, and 63 percent believes that their companies risked losing intellectual property rights when trying to integrate with local suppliers and third-party service providers (Shared Expertise Forums 2005). Similarly, a PricewaterhouseCoopers study reported that 60 percent of MNCs with operations in Asia cited inefficient IP protection as the biggest reason to consider leaving the region. Not just MNCs are impacted by IP concerns. A

majority of both MNCs and Asian firms surveyed cited unfair competition from generic brands in violation of IPR rules as a major deterrent to investment (PricewaterhouseCoopers 2007, 11).

Evolution of the Pharmaceutical Industry in India

Domestic Pharmaceutical Industry

The composition of the Indian pharmaceutical industry has changed with the patent laws. MNCs dominated the Indian market during the colonial period. The removal of patent protection fostered the growth of the domestic industry. Indian scientists became particularly adept in the reverse engineering and production of pharmaceutical products patented outside of India and in the development of noninfringing production processes. By contrast, the withdrawal of patent protection caused many multinational pharmaceutical companies to limit their product portfolio in India to patent-expired products or to pull out of the market altogether (Mueller 2007, 28). In 1970, foreign firms accounted for two-thirds of the market; by 2004, they held only a 23 percent market share (Chaudhuri 2005, 18).Pharmaceutical firms operating in India are a diverse group with varied interests in the new patent law. Although there are approximately 6,000 active firms, the top 300 make up most of the Indian market. The top tier is comprised of approximately 100 domestic and foreign-owned companies with annual sales greater than $650,000 (Sampath 2007, 16-17). The top three domestic firms, in terms of operating revenues, are Ranbaxy Laboratories, Cipla Ltd., and Dr. Reddy's Laboratories. The only Indian subsidiary of a multinational firm with operating revenues sufficient to place it within the top 10 firms in India is eighth-ranked GlaxoSmithKline Ltd. (GSK-India), a subsidiary of United Kingdom-based Glaxosmithkline (GSK) (Bureau van Dijk).

The top domestic firms compete with MNCs in the global generics market, often have significant investments outside of India, and engage in R&D, including strategic alliances with foreign and domestic firms (Sampath 2007, 16-7). In general, the R&D budgets of domestic firms are substantially smaller than those of the multinationals. Ranbaxy, for example, had R&D expenditures of 7 percent of sales in 2005 and Dr. Reddy's Laboratories' expenditures were 10 percent, as compared to an average R&D expenditure of 15 percent for the top 15 global pharmaceutical companies in 2005 (Pharmabiz 2007). The top tier firms, both foreign and domestic, generally support the amended patent law, believing that it provides a necessary incentive for innovation (Mueller 2007, 60).

In the second tier are approximately 200 medium-sized companies including generic producers and firms that specialize in niche areas such as contract research, with annual sales ranging from $210,410 to $650,000 (Sampath 2007, 16). Many of the medium-sized domestic generics firms have been exclusively focused on the reverse engineering and manufacturing of patented and unpatented drugs. Inasmuch as they do not have inventions of their own to protect and the new law undercuts a successful market niche, these firms generally have opposed the new patent law (Mueller 2007, 59-60).

The third tier is formed by the remaining firms, approximately 5700 small firms with annual sales less than $210,410, some of which perform contract manufacturing services for foreign and domestic pharmaceutical makers. More than the new patent law, contract manufacturing firms are impacted by the Drug and Cosmetics Act which now requires the implementation of Good Manufacturing Practices and has necessitated the substantial upgrading of facilities (Sampath 2007, 19). Although many smaller firms have been forced to shut down because they could not meet these enhanced standards, upgrading has provided some remaining manufacturers with increased opportunities to provide contract services to foreign firms.

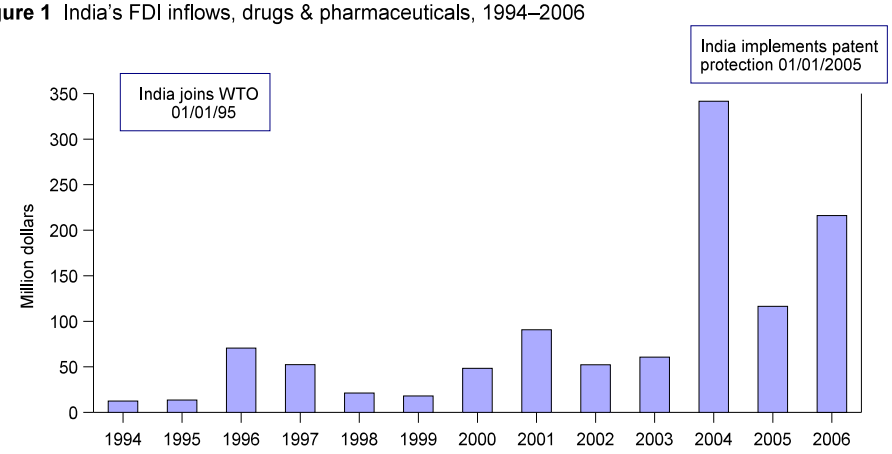
FDI in the Drug and Pharmaceutical Sector

Annual FDI inflows into India's drug and pharmaceutical sector have grown steadily from $12 million in 1994 to $342 million in 2004, declining to $116 million in 2005, and rebounding to $216 million in 2006 (figure 1).[3] In 2004, FDI inflows increased by 463 percent over 2003 levels, due in large part to anticipation of the "advent of the product patent era" (*Economic Times* 2005a). Ongoing uncertainty, perhaps attributable to perceived inadequacies in India's law in the areas of data protection, the standards for patentability, and compulsory licensing, appears to have tamped down FDI in 2005 and 2006.

The largest source of FDI in Indian pharmaceutical industry is Mauritius. Many global investors in India route their FDI through Mauritius to take advantage of the India-Mauritius bilateral tax treaty. The United States is the second-largest source, followed by the United Kingdom and Singapore (Figure 2). FDI in India takes various forms including greenfield projects (both the

[3] For overall FDI data, this article relies on official statistics of the Indian Ministry of Commerce. For greenfield projects, it cites data reported by OCO Consulting through LocoMonitor database. Discussions of strategic alliances are based on press releases and M&A data is provided by Bureau Van Dijk through Zephyr database. The projects and deals identified through the company databases and press releases are illustrative of FDI trends rather than identical to the data provided by the Indian Ministry of Commerce.

Figure 1 India's FDI inflows, drugs & pharmaceuticals, 1994–2006



Source: Government of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion.

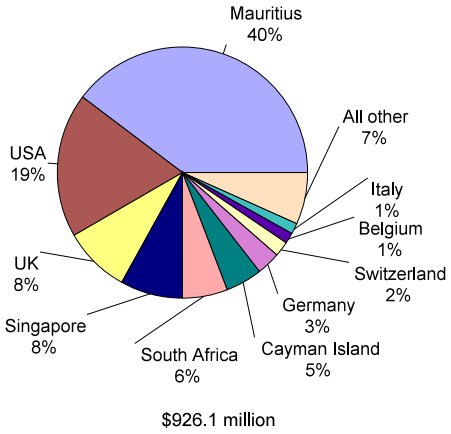
establishment of new facilities and the expansion of existing ones), strategic alliances between foreign and domestic firms, and mergers and acquisitions (M&A).

Greenfield Projects

During the period between 2002-06, foreign firms undertook about 80 greenfield investment projects in the pharmaceutical and health biotechnology sectors. The annual number of projects more than doubled between 2003 and 2004, and remained at high levels in 2005 and 2006 (figure 3). Most of the projects were for new facilities (83 percent) rather than expansions of existing facilities (17 percent). R&D was reported as the focus of most of the projects (59 percent), followed by manufacturing (26 percent) and sales and services (9 percent) (OCO Consulting Ltd).

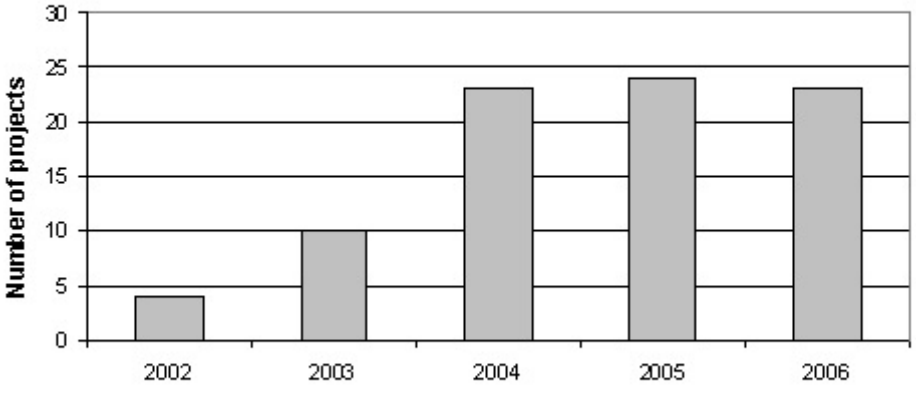
The majority of projects was undertaken by North American firms (51 percent), followed by European firms including those outside of the European Union (36 percent). North American and European firms concentrated their investment activities in R&D, with 66 percent of all North American projects in R&D and 62 percent of all European projects. For North American firms, the next most frequent investment activity was in sales and service (20 percent) followed by manufacturing (15 percent). By contrast, for European firms, most of the remaining investment activity was focused on manufacturing (34 percent) while only 3 percent was focused on sales and service activities (table 1).

Figure 2 Drugs and pharmaceutical FDI by country, 2002–06



Source: Government of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion.

Figure 3 Greenfield FDI in India's pharmaceutical industry, by year, 2002-2006



Source: OCO Consulting Ltd., *LocoMonitor FDI database*.

TABLE 1 Greenfield FDI in the pharmaceutical and health biotechnology sectors by source region and activity, 2002-2006

	North American Projects		European Projects		Asian Pacific Projects		Middle Eastern Projects	
	No.	%	No.	%	No.	%	No.	%
R&D	27	66	18	62	0	0	2	67
Manufacturing	6	15	10	34	4	57	1	33
Sales and Service	8	20	1	3	3	43	0	0
Total projects	41		29		7		3	

Source: OCO Consulting Ltd., LocoMonitor FDI database.

Note: Because of rounding, figures may not total 100 percent.

Strategic Alliances in R&D

Strategic alliances between multinational and domestic firms are an important part of FDI in the R&D and manufacturing sectors. In the R&D area, contract research organizations (CROs) offer pharmaceutical firms a range of services including product development, clinical trial management, laboratory services, and data management (Biotechmedia 2007). The top three reasons MNCs cite for performing clinical trials in India are the number of potential clinical trial subjects, cost savings and the country's disease profile (Ernst & Young 2005, 12). These reasons must be compelling; despite China's much larger market size, there are presently 251 clinical trials ongoing in India compared to 227 in China. MNCs with a substantial number of clinical trials ongoing in India include GSK with 25, Bristol-Myers Squibb (BMS) with 21, Johnson & Johnson with 16, and Pfizer with 14 (U.S. National Institute of Health). The Indian clinical trial market now is worth approximately $120 million and is expected to reach $1 billion by 2010 (PricewaterhouseCoooper 2007, 16).

Prominent examples of contract research services being performed in India include the recent contract between India-based Tata Consultancy Services (TCS) and U.S.-based Eli Lilly (Lilly), in which TCS's services will include "clinical trial data management, statistical analysis and medical writing" (Chatterjee 2006). In 2007, Lilly also announced a new agreement with the Indian firm Nicholas Piramal (NPIL), in which NPIL will design and execute

Lilly's global clinical development program, including investigational drug applications and human clinical trials (Singh 2007). Similarly, the U.S.-based biotechnology firm Amgen recently announced its entry into the Indian market with the opening of a wholly owned subsidiary in Mumbai which will initially focus on strategic alliances with CROs, particularly in the area of clinical development (Jayakumar 2007).

Already among India's top 10 pharmaceutical firms, GSK-India recently increased its presence in Bangalore by expanding its clinical trial data management, analyses and reporting activities to account for more of the data services required for GSK global clinical trials (Matthew 2006). In addition, GSK-India has signed a new R&D agreement with Ranbaxy to expand their 2003 agreement and increase Ranbaxy's drug-development responsibilities. Under the 2003 agreement, Ranbaxy developed drug leads only to the stage of candidate selection. Under the expanded agreement, Ranbaxy will "advance the leads beyond candidate selection to completion of clinical proof of concept" (Ranbaxy Laboratories 2007).

Similarly, Wyeth USA and India-based GVK Biosciences entered into a five-year agreement under which GVK will set up an R&D center in Hyderabad and hire 150 scientists in 2007 to work on Wyeth's drug discovery projects. According to Wyeth, the driving factors behind its decision to partner for contract research services were the growing skill base in Asia, India's 2005 revision of its patent laws, and the high quality of science at GVK (Hindu Business Line 2006). Most recently, in March 2007, U.S.-based BMS and Indian biotechnology firm Biocon broke ground on a new research facility planned to house 400 scientists working on early drug development for BMS in India (Biocon 2007).

These new and increasingly sophisticated R&D projects may be surprising given the reported inadequacies in India's patent law described above, and the fact that India does not have a data protection law. However, different IP protection mechanisms generally apply to the R&D projects described here than to product patenting and commercialization. R&D projects depend on the relationship between the parties, pre-contract due diligence, strong contractual protections, operational security practices, and documented compliance with international standards (such as ISO 27001 which addresses information security management systems), to ensure the confidentiality of proprietary data (Kumar 2007). India's Contract Act and its Information Technology Act may also provide statutory bases for the protection of sensitive R&D data and proprietary information; to date, these statutes have been used to protect sensitive information shared in the course of business process outsourcing (BPO) projects (Boston Consulting Group 2006, 5).

By contrast, the data protection law sought by multinational firms would govern the commercialization of a product and the submission of clinical trial data to drug regulatory authorities in India. Clinical trial data developed in R&D projects may or may not be submitted to Indian regulatory authorities. If the data supports global trials, it likely will be submitted in regulated markets, such as those of the United States and the European Union, where there are data protection laws. Thus, the lack of a data protection law in India may not be of critical importance to a company's decision to conduct R&D there.

This said, this article reports numerous instances in which multinational pharmaceutical firms have stressed the importance of a strong IP protection environment to their investment decisions. MNCs remain wary of investing in countries where the fruits of their investment will be used to foster low- cost competitors. The IP landscape in India prior to 2005 gave rise to substantial uncertainty about whether Indian courts would protect the sensitive information developed in pharmaceutical R&D projects. Under the 1970 Patents Act pharmaceutical products were not entitled to patent protection, thus there would be little motivation for a court to protect the R&D for these products—one could even envision a public policy-based challenge to a contract that attempted to do so. Now that the law does provide patent protection for pharmaceutical products, legal protections for the underlying R&D may be more available.

Strategic Alliances in Manufacturing

A second major focus of FDI in India is outsourced contract manufacturing. This contract manufacturing includes the production of intermediates, active pharmaceutical ingredients (APIs), bulk drugs, formulations, and generic drugs. U.S.-based Pfizer, for example, maintains a single drug manufacturing facility in India, but also outsources manufacturing to about 20 Indian companies (Mueller 2007, 52). U.S.-based Merck has recently decided to outsource 35 percent of its manufacturing processes to developing countries, and particularly India, in order to substantially reduce costs. According to Merck, "the critical factor" driving the decision to increase Indian investment was the patent law change (*Economic Times* 2006). The Indian Government has noted that "top MNCs like Pfizer, Merck, GSK, Sanofi Aventis, Novartis, Teva, etc. are largely depending on Indian companies for many of their APIs and intermediates" (Government of India, Ministry of External Affairs). Like the Indian clinical trial market, contract manufacturing, currently a $250 million market, is predicted to reach $1 billion by 2010 (PricewaterhouseCoooper 2007, 16).

One reason for Indian strength in the area of contract manufacturing, as compared with conditions in other emerging markets, is the large number of manufacturing facilities that the U.S. Food and Drug Administration (FDA) has certified (Ernst & Young 2005, 10). FDA certification allows pharmaceutical products to be imported into the United States. Outside of the United States, India has the largest number of FDA-approved manufacturing facilities, numbering 85 in 2007 (PricewaterhouseCoopers 2007, 16). Large numbers of scientists and engineers with unique skills in the areas of process chemistry and biochemistry also support the strength of India in contract manufacturing.

As with contract R&D, contract manufacturing permits the segmentation and protection of production processes so that valuable intellectual property is not lost. For example, different variants of a molecule may be tested in different locations, fire walls may be set up between production functions, and the contract relationship may begin with commodity style production services and evolve only upon the establishment of trust. Indian expertise in BPO also has resulted in a demonstrated competence in security practices and contractual provisions such as nondisclosure agreements, as well as comfort with global standards that cover security domains (Kumar 2007). The success of manufacturing relationships for the production of pharmaceuticals has been the precursor to increasingly complex and sophisticated R&D and manufacturing collaborations between Indian firms and MNCs.

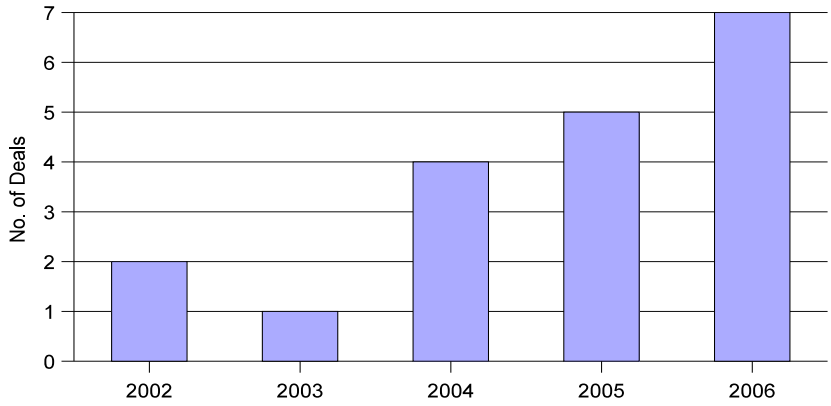
Pharmaceutical M&A

Cross-border M&A deals in India's pharmaceutical sector have been on the upswing since 2003 (figure 4). European companies have been the most active acquirers with 61 percent of all deals, followed by North American firms with 26 percent (Bureau van Dijk). See table 2.

The most significant deal in terms of scale and value was the January 2007 acquisition by Mylan, one of the largest generic drug providers in the United States, of a majority stake in India-based Matrix, the world's second-largest API manufacturer. The deal was valued at $548 million. According to Mylan, the merger was needed to expand its manufacturing platform, obtain a presence in key markets, and tap into local technical expertise in the production of generic biologics (Roumeliotis 2006).

U.S.-based Watson Pharmaceuticals similarly expanded its operations in India by acquiring two Indian companies. In 2005, it acquired a finished dosages manufacturing plant from Dr. Reddy's. In 2006, it acquired Sekhsaria Chemicals, a company focused on process R&D and contract manufacturing services. Watson reported that the two acquisitions would improve efficiencies

Figure 4 Pharmaceutical M&A Activity, 2002-06



Source: Bureau van Dijk, *Zephyr Mergers and Acquisitions database*.

and cost management and enhance the company's competitive position (Bureau van Dijk).

Acquisitions by European companies also focused on expanding Indian operations, including three acquisitions by Iceland-based Actavis during the period from 2005–07. In 2005, Actavis acquired Lotus Laboraties, a CRO, in a $27 million deal. In 2006, it acquired a manufacturing plant from Grandix Pharmaceuticals to obtain "backward integration" with an API and a finished dose development and manufacturing unit. Then, in 2007, it acquired Sanmar Specialty Chemicals, a developer and manufacturer of API, with the goal of continuing its backward integration and reducing costs. In 2006, the French company, Merieux Alliance, acquired a majority stake in Shantha Biotechnics, an Indian company focused on R&D for infectious disease vaccines, to get access to proprietary research and a branded product base. M&A activity during this period also enabled European firms—including AstraZeneca and Solvay—to increase their majority stakes in Indian affiliates (Bureau van Dijk).

The globalization of clinical research and manufacturing operations—with the goal of reducing costs and accessing Indian expertise—has resulted in increased M&A activities in India over the last five years. As with other types of FDI, these M&A activities have increased in size and scope with the evolution of India's IP laws towards compliance with international standards.

TABLE 2 Selected contract manufacturing deals in pharmaceuticals in India

Indian contract manufacturer	Multinational company	Product
Lupin Laboratories	Fujisawa (Japan)	Cefixime
	Apotex (Canada)	Cefuroxime Axetil, Lisinopril
	DMS (USA)	API for cephalosporings
Nicholas Piramal	Allergran (USA)	Bulk and formulations
	Advanced Medical Optics (USA)	Eye products APIs
	AstraZeneca (Sweden) . .	
	Pfizer (USA)	APIs
Wockhardt	Ivax (USA)	Nizatidine (anti- ulcerant)
Dishman Pharmaceuticals	Solvay Pharmaceuticals (Belgium)	APIs and formulations Intermediates and APIs
	GSK (UK)	Nexium
	AstraZeneca (Sweden) . .	Losartan
	Merck (USA)	
IPCA Labs	Merck (USA)	Bulk Drugs
	Tillomed (UK)	Atenelol
Orchid Chemicals and Pharmaceuticals	Apotex (Canada)	Cephalosporin and other injectables
Sun Pharma	Eli Lilly (USA)	Cardiovascular products, anti-infective drugs and insulin
Kopran	Synpac Pharmaceuticals (USA)	Penicillin
Cadila Healthcare	Altana Pharma (Germany)	APIs and intermediates
	Boehringer Ingelheim (Germany)	Gastrointestinal and cardiovascular products
	Mayne (Australia)	Intermediates for oncology products
Biocon	Bristol Myers Squibb (USA)	Bulk Drugs
Shasun Chemicals	Eli Lilly (USA)	APIs
	GSK (UK)	APIs
	Reliant Pharma (USA) . .	APIs
	Alpharma (USA)	Generics & APIS
	Boots (S Africa)	APIs
Jubilant Organosys	Novartis	Intermediates and APIs

Sources: Government of India, Ministry of External Affairs, ITP Division, and Greene, William.

Conclusion

India has charted its own IP path over the last 35 years, attempting to foster the growth of a domestic pharmaceutical industry and access to medicine while more recently also addressing the requirements of the international IP regime. Multinational pharmaceutical firms have responded to the Indian movement towards TRIPS compliance by increasing the quantity and quality of FDI in the areas of R&D and manufacturing. By contrast, MNCs have adopted a more cautious attitude toward patenting and commercialization of pharmaceutical products in India, waiting to see how Indian courts and patent offices interpret the new laws, and awaiting the enactment of data exclusivity legislation. The ultimate success of India's "calibrated approach" to fostering the domestic industry and access to medicine while also addressing international intellectual property requirements remains to be seen.

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Export Taxes on Agricultural Products: Recent History and Economic Modeling of Soybean Export Taxes in Argentina

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Abstract

This paper examines the issue of export taxes on primary commodities; almost 40 countries applied export taxes in recent years. The case of Argentina, which is a prominent user of the export tax and a leading exporter of soybean products, is then considered. In 2006, it taxed exports of soybeans, soybean meal and soybean oil, respectively, at 23.5 percent, 19.3 percent, and 20 percent. We simulate the effects of altering these taxes. Removing export taxes on soybean oil and meal, but continuing the tax on soybeans causes exports of meal and oil to rise and exports of soybeans to fall. Exports of each product increase when taxed uniformly at 10 percent. Removal of the taxes on all products increases exports of each product. Devaluation of the Argentinean peso by about 60 percent in 2002 likely affected these exports more than the changes in the export tax that were considered.

[1] William Deese (william.deese@usitc.gov) is an International Trade Economist from the Department of Economics and Mr. John Reeder is a now retired economist from the US International Trade Commission. The views presented in this article are solely those of the authors, and do not necessarily represent the opinions of the US International Trade Commission or of any of its Commissioners.

Introduction:
Why Countries Restrict Exports

Export taxes are taxes that domestic governments impose on products destined for sale abroad; they are applied either as a percentage of product value (an ad valorem tax) or as a fixed rate per physical unit of product (a specific tax) (OECD 2006, 4; Kazeki 2006)[1] Export taxes are sometimes referred to as export duties, export charges, export fees, customs duties on exportation, export tariffs, or export levies (Kazeki 2006, 178-179).

Frequently cited justifications for imposing export taxes include generating government revenues, promoting downstream processing industries, and more recently protecting the environment and preserving natural resources.[2] Other objectives are price stabilization, domestic food security, resource allocation, and income distribution (Piermartini 2004, 7-15). Developing countries are the primary users of export taxes because they are simple to apply and potentially produce significant revenue.

Countries that use export taxes commonly impose higher rates on exports of raw materials than on exports of processed goods. They frequently justify such differential export taxes as a means to diversify exports and to develop a domestic processing industry. Export taxes are sometimes used with other mechanisms, such as indirect taxes, import tariffs (on both the product itself and on inputs), and exchange rate policy, to promote the development of a domestic processing industry; such a strategy is often called import substitution industrialization (ISI) (Tarp-Jensen, Robinson, and Tarp 2002, 2).

Governments generally encourage exports as an important national income source, which would imply they are more likely to subsidize exports rather than to tax them. However, taxing exporters who receive foreign exchange is often more tenable politically than taxing small producers for the local market (Tarp-Jensen, Robinson, and Tarp 2002, 2-4). After a currency devaluation, for example, exporters whose goods are priced in foreign

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[2] Tax credits for exports are generally described as an export subsidy and included under the WTO Agreement on Subsidies and Countervailing Measures.

[3] Ten of the 15 less developed countries covered in WTO Trade Policy Review Mechanisms imposed export taxes. But only three of the 30 OECD countries used these taxes (Piermartini 2).

currency become better off than those whose earnings are in local currency. Concerns over equity could lead to taxing exports more after a devaluation to compensate for less government revenue from other sources. Equity concerns usually suggest that all exports be taxed at similar rates, but a country could improve its terms of trade by taxing exports of products in which it is a large supplier in world markets.

Types of Polices Restricting Exports

More broadly, an export tax is but one type of export restriction that can include export licensing, export bans, and other nontax measures (Piermartini 2004, WTO 2004, 3; and OECD 2006, 4). Another type of export restriction is a ban or embargo on certain primary goods; before these goods can be exported, they must be partially or fully processed. Agricultural products, such as live or raw fish, wildlife, hides and skins, and raw grain are commonly banned from export. Moreover, most rice-producing countries ban the export of rough rice, and only allow the export of brown, semimilled or fully milled rice (Childs and Hoffman 1999, 28). The United States, which does not tax exports, is one of the few countries that does not ban the export of rough rice. Other countries, for example Indonesia, ban exports of raw logs, cattle hides, and raw animal skins (Piermartini 2004,18-19). Products from endangered species are frequently banned by domestic law and international agreements.

Overview of the Use of Export Taxes

Major commodity exporters have a long history of raising government revenue from export taxes on a variety of commodities (petroleum, mineral and metal products, sugar, coffee, cocoa, raw logs and forestry products, fishery products, tobacco, leather and hides and skins, grain, edible nuts, bananas, and oilseed products [palm oil, copra, soybeans]) (Piermartini 2004 appendix table). If product demand is highly inelastic and/or a country controls a significant share of world exports, an export tax shifts the burden of the tax onto foreign consumers. Based on notification to the WTO during 1995-2002, 39 countries imposed export taxes on primary commodities, including minerals, logs, and fish (Piermartini 2004 appendix table 1).

In terms of the value of exports, Argentina is the leading user of export taxes (which will be discussed in detail below) on agricultural products.

Malaysia and Indonesia have applied differential export taxes to palm oil to encourage the export of refined rather than crude palm oil. Ukraine and Russia taxed sunflower-seed exports in an effort to promote domestic production and export of sunflower-seed oil. Other smaller agricultural exporters with export taxes include Fiji (sugar), India (hides and skins), Uganda (coffee), Colombia (coffee), Costa Rica (bananas), Guatemala (coffee), and Malawi and Zimbabwe (cotton and tobacco) (Tarp-Jensen, Robinson, and Tarp 2002,15-18; Piermartini 2004 appendix table 1).

The leading countries (in terms of the value of the tax) imposing differential export taxes on grain and oilseed products over the past several decades are Argentina, Malaysia, Indonesia, Ukraine, Russia, and until 1996, Brazil (Hoffman, Dohlman, and Ash 1999, 9, 35).[4]

The World Bank discourages developing countries from using export taxes, and a number of countries, such as Ukraine, Brazil, and Indonesia, dropped or reduced such taxes. The bank believes that export taxes on agricultural products created a bias against agriculture in developing countries during the 1980s (Tarp-Jensen, Robinson, and Tarp 2002, 21). The International Monetary Fund and the World Bank attempted to eliminate these biases through their structural adjustment programs in the late 1980s and 1990s.

Export Taxes and the WTO and Empirical Literature

The GATT and Export Taxes?

The WTO does not specifically prohibit differential export taxes (Hoffman, Dohlman, and Ash 1999, 35; and Piermartini 2004; OECD 2003, 9). Such taxes must be transparent and nondiscriminatory under the most favored nation (MFN) principle of article I of the GATT, and the general transparency requirements (publication of regulations) of Article X of the GATT (OECD2003, 9; Piermartini 2006, 7-15). However, there is no

[4] See as well Ash and Dohlman, Oct. 2000., 8-9; Apr. 11, 2002,4; and Oct. 2002, 13-15. Until 1996, Brazil imposed export taxes on many agricultural products, and applied differential export taxes to promote the export of soybean meal and soybean oil over soybeans. After the elimination of its differential tax in 1996, Brazilian exports of soybeans more than doubled from 3.6 MMT to 8.3 MMT, while its exports of soybean oil and meal declined.

obligation to notify the WTO (Kazeki 181). In 2004 about one-third of WTO Members imposed export duties (Piermartini 2004, 2). Generally, all U.S. regional trade agreements, such as NAFTA and CAFTA, specifically prohibit export taxes.

Current Status of Export Taxes in Doha Round

The Negotiating Group on Market Access discussed export taxes and export restrictions in 2002 in the Doha Round but did not reach a resolution (Kazeki 2006, 197, at footnote 21). The U.S. proposal in July 2002 on market access for agricultural products only allowed developing countries to impose export taxes for revenue purposes and required such taxes to be applied at a uniform rate on all agricultural exports for at least one year (OECD 2003, 17 at footnote 25). The EU proposed removing all export restrictions on raw materials (Kazeki 2006, at footnote 21). Food-importing countries, notably Japan and Switzerland, proposed elimination of export restrictions and taxes that impede exports in order to improve their own food security (WTO 2005). A Cairns Group proposal linked reductions on export taxes and restrictions to the elimination of import tariff escalation, but some developing countries argued that export taxes are sometimes needed to promote domestic processing in a response to developed countries' import tariff escalation (WTO 2005).

The Hong Kong Ministerial Declaration in December 2005 stated that certain proposals regarding differential export taxes were tabled and referred to and that there was an appreciation of the underlying issues but no consensus on how to proceed. Talks in July 2006 failed to agree on reductions in farm subsidies and on lowering import tariffs, and negotiations were suspended (WTO July 2006). The Director General of the WTO stated that political conditions are now more favorable for concluding the round than they have been recently (Lamy 2007). However, it remains uncertain whether an agreement will be reached and what implications it may have for export taxes.

Review of Empirical Studies on Export Taxes on Agricultural Trade

A 2002 analysis of agricultural export taxes and related trade policies (import tariffs, exchange rates, indirect taxes) found that export taxes in the 1990s were significant in only two developing countries (Malawi and

Zimbabwe) out of 15 major agricultural exporters studied (Tarp-Jensen, Robinson, and Tarp 2002, 21). The incidence of export taxes, when weighed with other policy measures and the size of the export trade, was not a significant burden to agriculture in the 13 other developing countries including Argentina. However, Argentina during the 1990s imposed only negligible export taxes.

Several more recent economic models of world agriculture investigated the effect of the multilateral removal of all border taxes, including export taxes, domestic agriculture subsidies and other distortions of world agricultural markets (Fabiosa, Beghin, de Cara, et al 2003; and Fabiosa and Beghin 2002).

According to these studies, elimination of the Argentine differential export tax would reduce Argentine exports of soybean oil and meal and increase its exports of soybeans, resulting in a contraction of the Argentine soybean-processing industry.

The Argentine Soy Sectors

Research Objective

U.S. oilseed product exporters have complained since the early 1980s about differential export taxes in foreign countries, which artificially encourage the export of semiprocessed or fully processed oilseed products onto world markets, and urged the elimination and restriction of such taxes under the WTO (American Oilseed Coalition). These exporters argue that a differential export tax reduces the volume of exports and distorts trade by favoring the export of processed products (Hoffman, Dohlman, and Ash 1999, 35). Because the United States does not impose export taxes, it exports primary goods with lower value added in higher volume and processed goods in lower volume compared to countries with differential export taxes. As a result, the affected U.S. processing sector may be negatively impacted in export markets, if Argentina is able to influence the world price.

The objective of the current paper is to examine the Argentine soybean sector in the context of export taxes on the primary product, soybeans, and on the secondary products, soybean meal and soybean oil.

Overview

Argentina is the primary agricultural exporter using differential export taxes, although other countries have other types of export restrictions. Argentina steadily increased its soybean production every year since the early 1980s. Its financial downfall and extreme currency devaluation in 2002 gave a great impetus to its exports of soybeans and products during 2002-06. The real value of the Argentine peso relative to the U.S. dollar fell by more than 60 percent from 1.04 pesos per dollar in 2001 to 2.68 pesos per dollar in 2002 at 2000 price levels.[5] Thereafter, this real exchange rate strengthened during 2003-06, rising to 2.01 pesos per dollar in 2006. World trade in soybeans and products is denominated in dollars, and thus Argentine soybean producers immediately experienced a 60 percent rise in their gross peso revenues after the devaluation. Although the currency devaluation made Argentine exports more competitive, it did result in a loss of wealth for its citizens.

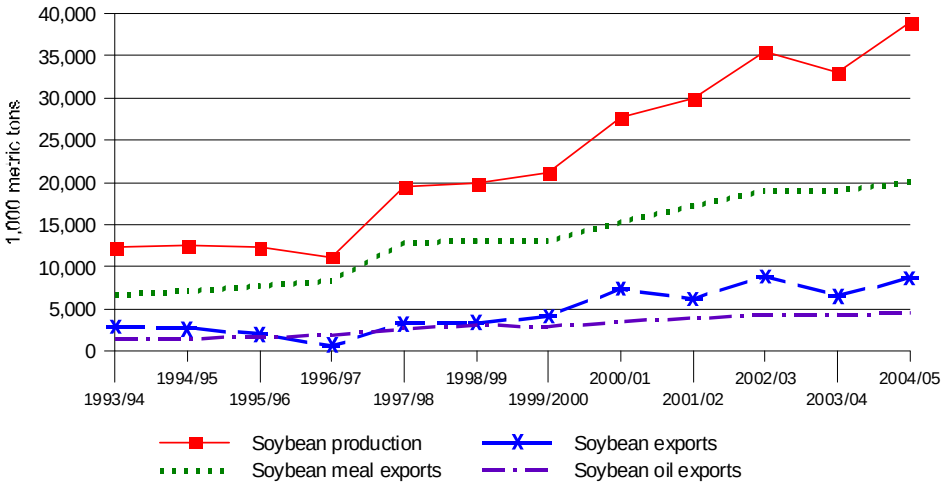
Trends in Production, Consumption, and Exports

Argentine soybean production more than tripled since marketing year 1994/95[6] to a projected 41 million metric tons (MMT) in 2006/07 (figure 1) (USDA FAS Oilseeds, table 12). Argentine soybean production grew rapidly because (1) acreage planted to soybeans is more profitable than acres planted in grain or pasture; (2) the costs of producing soybeans in Argentina are about one-half those in the United States, the leading world soybean producer and exporter; (3) the development of quicker maturing biotech soybean varieties and no tillage practices permitted planting in previously uncultivated areas or double cropping; and (4) more favorable rainfall in previously dry areas within Argentina expanded cultivated areas (USDA, FAS 2006, 2-3; and Schnepf, Dohlman and Bolling 2001, 15). The total harvested area in all crops within Argentina rose by 10 million hectares to 25 million hectares during 1994/95 to 2005/06, and all of the increase was planted into soybeans (USDA, FAS 2006, 2). These additional 10 million hectares represent both previously uncropped land and effectively new areas obtained from double-cropping soybeans with wheat or double-cropping soybeans with itself. Closely responding to the surge in

[5] Calculations are based on data in IMF Financial Statistics (Feb. 2007) using the GDP deflator to adjust to the real rate. The official average nominal rate was 3.06 pesos per dollar in the fourth quarter of 2006.

[6] This refers to the planting-harvesting-marketing cycle. For Argentine soybeans, it is October to September.

Figure 1 Soybeans, soybean oil, and soybean meal: Argentine production and exports, 1993/94 to 2004/05.



Source: USDA, FAS, *Oilseeds World Markets and Trade*, various months.

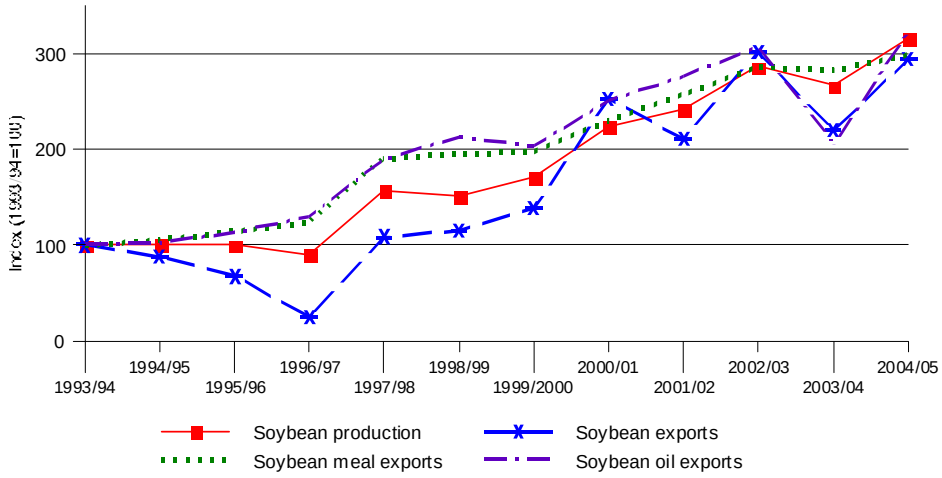
soybean production, Argentine production of soybean oil and meal (nearly 99 percent of which is exported) tripled. Argentina overtook neighboring Brazil and became the world's leading exporter of soybean oil and meal in marketing year 1996/97. Exports of Argentine soybean oil and meal similarly tripled during this same period.

The annual growth rate of Argentine exports of soybean meal and soybean oil generally exceeded that of Argentine soybean production and of exports of soybeans during 1993/94 to 2004/05 as the domestic processing industry consumed a greater share of soybeans (figure 2). As a share of world exports, the Argentine share for soybeans rose only slightly, but its share of soybean oil exports rose from about 35 percent to 50 percent of world exports (figure 3).

The annual soybean-processing capacity in Argentina nearly doubled in this period from 17 MMT in 1994 to 32 MMT in 2005 (McKee 2005, 33; and Schnepf, Dohlman, and Bolling, 2001, 25). Plant expansions in 2006 further raised soybean processing capacity to 40 MMT.[7] Such expansion involved the construction of the two largest soybean processing plants in

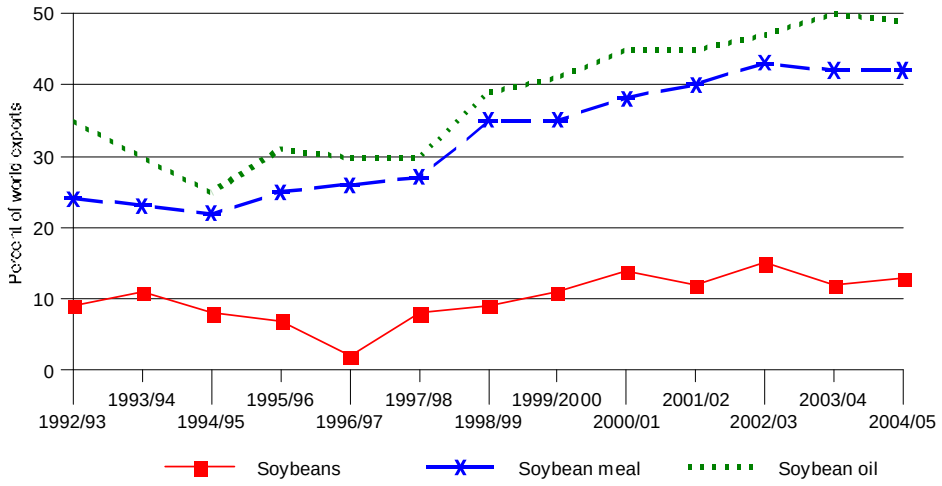
[7] The "big-four" world agricultural exporting companies, ADM, Bunge, Cargill, and Dreyfus, announced a $750 million investment that includes port and terminal infrastructure McKee 2005, 33.

Figure 2 Soybeans, soybean oil, and soybean meal: Rate of growth in Argentine production and exports, 1993/94 to 2004/05.



Source: USDA, FAS, Oilseeds World Markets and Trade, various months.

Figure 3 Soybeans, soybean oil, and soybean meal: Rate of growth in Argentine production and exports, 1992/93 to 2004/05.



Source: USDA, FAS, Oilseeds World Markets and Trade, various months.

the world, each with a daily capacity between 15,000 and 18,000 metric tons (McKee 2005, 33)[8].

History of Argentine Export Tax

Argentina has used export taxes mainly to collect revenue, and to promote exports of processed, higher valued agricultural products, as part of an ISI strategy (Schnepf, Dohlman, and Bolling 16). In the 1980s, agricultural export taxes accounted for nearly one-third of Argentine Federal tax receipts (Meike 6).

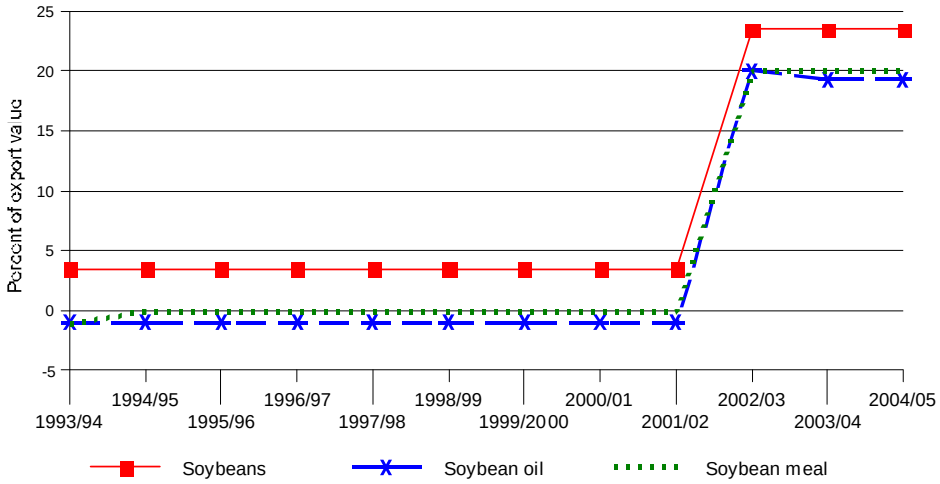
Argentina in 2005 applied differential export taxes to soybean, sunflower-seed, peanut and cottonseed products. Argentina applied differential tax rates to wheat flour, meat products, and milled rice exports. In 2005, export taxes on Argentine soybeans, soybean oil and soybean meal were respectively 23.5 percent ad valorem equivalent (AVE), 19.3 percent AVE, and 20 percent AVE, according to the USDA (figure 4) (USDA, FAS, Argentina Annual 2005, 8). In 2005 export taxes on oilseeds and products generated $1.4 billion of revenue, most of which went to support domestic social programs unrelated to agriculture (USDA, FAS, 2006, 3).

Argentina taxed agricultural exports for many decades; its export tax on soybeans was reduced from 41 AVE percent in May 1989 to 3.5 percent AVE on soybeans (and its tax on soybean oil exports to 1.0 percent) during the 1990s. However, following its economic crisis in the 2002, Argentina raised the soybean tax to its current rate of 23.5 percent, and the tax on soybean oil and meal to 19.3 and 20.0 percent, respectively (figure 4). In 2005/06, the 3.75 percent ad valorem tax differential between soybeans and soybean oil amounted to about $8.50 per metric ton of soybeans (based on an Argentine soybean price of $227 per metric ton in 2005/06; (USDA, FAS, Oilseeds, table 20)).

The differential export tax, which amounted to $8.50 per metric ton of soybeans in 2005/06, created an incentive for companies to expand soybean processing in Argentina. One would expect that such an incentive would result in less soybean processing by major soybean-producing countries. Countries, which have imported soybeans for domestic

[8] A typical U.S. soybean processing plant has a daily 2,000-ton capacity. The largest U.S. soybean processing plants have daily capacity of 4,000 to 5,000 tons each, according to *Milling and Baking News,* Sept. 17, 1996, 10, and Oct. 26, 1999, 11; *Feedstuffs*, Aug. 5, 1996,5.

Figure 4 Soybeans, soybean oil, and soybean meal: Argentine production and exports, 1993/94 to 2004/05.



Source: Randall Schnepf, Erik Dohlman and Christine Bolling, USDA, ERS, Agriculture in Brazil and Argentina, December 2001, pp. 17-21; USDA, ERS, "Export Taxes Hinder Farm Benefits from Argentina Currency Devaluation," Oil Crops Situation and Outlook Report, Oct. 2002, pp. 13-16; and USDA, FAS, Argentina Oilseeds and Production

Note: A negative number indicates an export subsidy instead of an export tax. Markets and Trade, various months.

processing, would tend to reduce their imports of soybeans and increase the imports of the two co-products (Fabiosa, Beghin, de Cara, Fang, Isik, and Matthey, 870; and Fabiosa and Beghin 13-15).

The variable processing costs of soybeans in Argentina and Brazil in the mid to late 1980s amounted to $14 per metric ton of soybeans processed, as compared to a $20-per-metric-ton cost in the United States (USITC 1987, table 8-7). The tax savings because of the export tax on soybeans amounted in 2005/06 to 43 percent of the variable costs of processing soybeans into soybean oil and soybean meal. A reduction in the price of soybean meal and oil is likely to affect exports of soybean oil and meal because the products are highly interchangeable and price competition is intense.

Modeling the Argentine Export Tax

Model

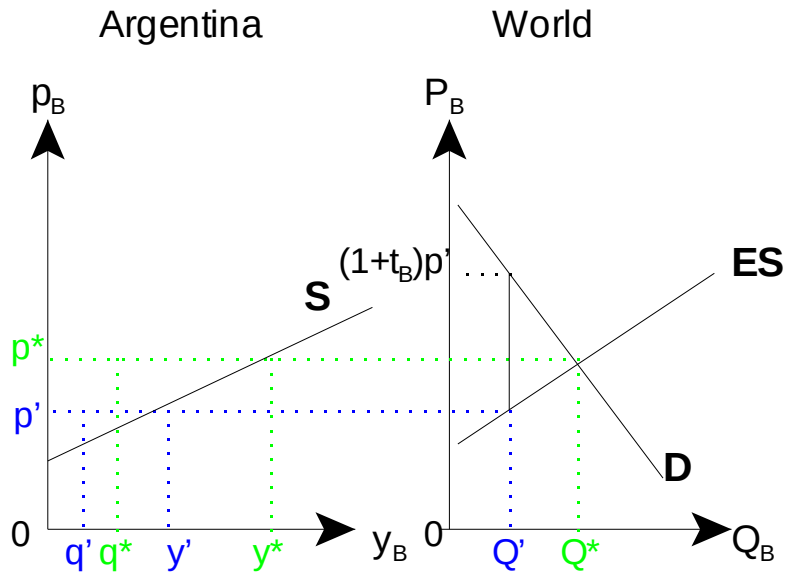
An equilibrium displacement model was used to simulate the effect on the observed equilibrium of changing the export taxes on Argentine soybean products. Storage or other dynamic features are not included. A key characteristic of the model is that soybean oil and meal are jointly produced in fixed proportions from soybeans and other inputs. The model has three products (soybeans, soybean oil and soybean meal) and two regions (Argentina and the rest of the world). In keeping with a common assumption in modeling oilseed products, a homogeneous products or perfect substitutes model was used.[9] Such a model assumes that similar products are the same regardless of source.

Excess supply (domestic production minus domestic consumption) is equal to the demand for imports from the rest of the world. As previously stated, Argentina is the world's largest exporter of both soybean oil and soybean meal and is one of the world's largest exporters of soybeans. Thus, Argentina is assumed to be a large country for these products and has, in each case, an upward sloping excess supply curve. This model assumes that other large producers, such as Brazil and the United States, hold supply constant, and supply from these countries is not modeled. Thus, the effects of any increased exports from these countries into Argentina is ignored. Historically Argentina's imports of soybeans have been quite low; for example, its soybean imports were only 1.2 percent of domestic production in marketing year 2005/06. The model is mathematically derived in appendix A; a graphical explanation is presented next.

Without an export tax, Argentina would produce y* tons of soybeans and consume q* tons domestically (figure 5). In this case, the excess supply of soybeans Q* would equal y* - q*, and the equilibrium price in both the Argentine and world markets would be p*. Currently, however, an ad valorem export tax (t_B) is in place that separates the world demand price from the export supply price; Argentine exporters receive a price of p´ per ton, and demanders from the rest of the world pay $(1+t_B)p´$ per ton (right

[9] See Piggott and Wohlgenant (2002) or Meilke, Wensley, and Cluff (2001) for examples of homogeneous product soybean models.

Figure 5 Equilibrium price and quantity in Argentine and world soybean markets



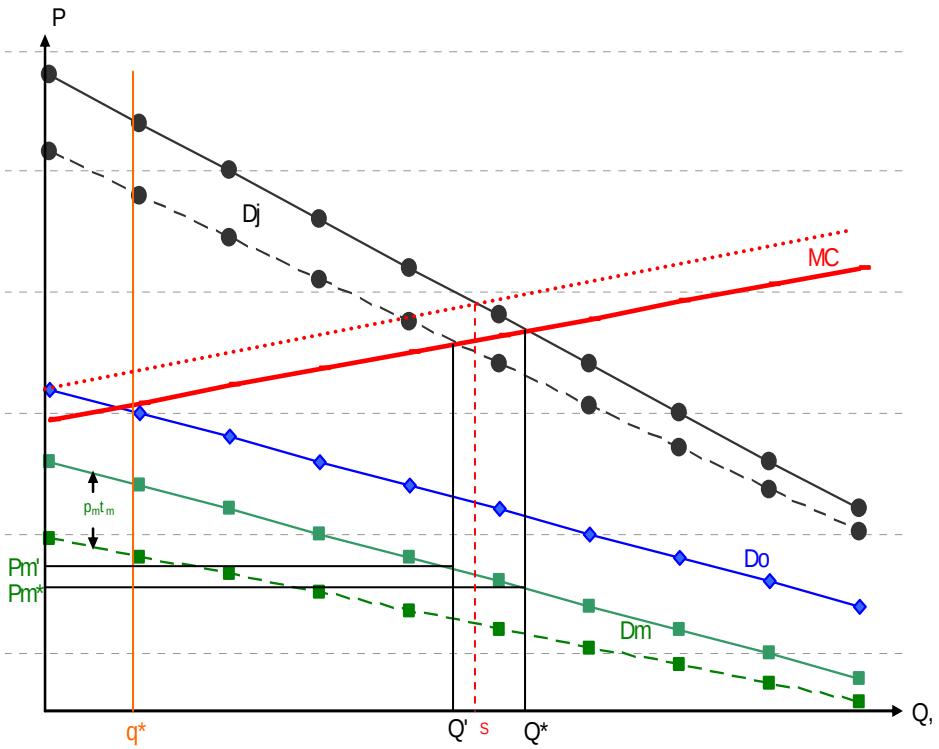
panel). The tax raises the world demand price for imports of soybeans but lowers the price received by Argentine producer/exporters, who are willing to sell in the Argentine domestic market for the same price that they receive for exports. With the export tax and the lower price for producer/exporters, domestic output falls to y´.

So far, the explanation is consistent with the standard partial equilibrium effect of an export tax, except that domestic demand for soybeans is not downward sloping. Argentine producers of soybean meal and oil are virtually the sole domestic purchasers of soybeans. The domestic demand for soybeans is derived from the demands for soybean meal and oil. The soybean products industry is optimized to use soybeans efficiently and cannot produce the same quantity of soybean meal and oil with a lesser quantity of soybeans; it thus uses a fixed proportions technology. Efficient production in this industry requires that soybeans and other inputs be used in the same proportion to each other, and technology is such that a similar level of output cannot be maintained by substituting other products for soybeans. In a fixed proportions industry, the derived demands for inputs are independent of price. In effect, the derived domestic demand curve for soybeans is horizontal at the price level, p* or p´, up to the point where it

is proportional to desired output levels of soybean mill products given their final demands and prices of other inputs; at this point it becomes vertical. If this were a single product model, the story would end here, and the quantity effect would be less than the case of a downward sloping domestic demand curve. The quantity demanded of soybeans, however, depends upon the equilibrium outputs of soybean meal and oil.

A higher price for soybeans will raise the marginal cost of producers of Argentine soy mill products and make their soybean meal and soy oil less competitive on world markets and vice versa. We assume that policy changes and resource availability are such that the firm is not forced to shut down for not covering its average variable costs or to operate at a suboptimal level due to the unavailability of the desired level of an input. The higher price for soybeans increases the marginal cost of producing soy mill products (which is depicted in the dotted or upper red MC curve in figure 6). This decreases the equilibrium quantity of soy mill products sold from Q* to S, which, in turn, shifts the derived domestic demand for soybeans to q´ (in figure 5), and excess supply falls to Q´= y´- q´.

Figure 6 Equilibrium in soybean meal and soybean oil joint products market



Incurring the cost of acquiring crushed soybeans enables the production of soybean oil and meal. Soybean oil and meal are jointly produced from crushed soybeans; the oil is expressed, and the remainder is processed as soybean meal. Soybean oil and meal are true joint products of crushed soybeans, and the production of soybean meal does not compete with the production of soybean oil for the same part of crushed soybeans. The condition for equilibrium in competitive output markets for the joint products is that the marginal cost of the joint product equals the sum of the benefits of the production, which is the vertical (price) sum of the demand for the joint products.[10] Next, demands for soybean mill products are discussed.

The domestic demand for soybean oil, which is used primarily for cooking, is believed to be price inelastic because Argentineans do not typically use soybean oil, as previously discussed. Similarly, the domestic demand for soybean meal, which is often used as a feed supplement for livestock and poultry, is believed to be price-inelastic as Argentineans do not typically feed meal to livestock and have little poultry production.

Soybean meal and soybean oil are scaled into units that can be produced with one metric ton of crushed soybeans.[11] The fixed or inelastic domestic demand for soybean meal is denoted by q* (figure 6); a similar vertical demand exists for soybean oil, although it is not depicted to avoid overloading the graph. Let D_j denote the vertical sum of the world demand for imports of soybean meal (D_M) and soybean oil (D_O). Equilibrium is the point where the marginal cost of the joint product (M_C) intersects the joint product demand curve (D_j). The equilibrium export quantity of soybean meal is found by subtracting domestic production from this point on the quantity axis (Q*-q*). Market-clearing prices are read off the price axis from the point where the vertical line below the intersection of the MC and demand curves for the joint product crosses the demand curves for the soy mill products (P_M* for soybean meal; the price of soybean oil is similarly found but not shown to reduce clutter on the graph).

Currently an ad valorem tax of t_m on exports of soybean meal separates the world demand price $P_m=(1+t_m)p_m$ from the export supply price p_m. (The situation for an export tax on soybean oil is similar but is not depicted to

[10] This is a well established economic principle; see, for example, Layard and Walters 1978, 178-179.

[11] For the case of joint products, Friedman showed that scaling products into similar units allowed all supply and demand curves to be shown on the same graph (Friedman 1976, 153-160).

avoid confusion on the graph.) The green hashed line (D_m) shows the export demand for soybean meal at supply prices when the tax is imposed on exports of soybean meal.[12] To find the equilibrium quantity with this tax in place, we add the demand for soybean meal at the export supply price to the demand for soybean oil (D_o) to construct the effective demand curve for the joint product (hashed D_j) and find its intersection with the curve for the marginal cost of the joint product. The resulting equilibrium quantity is Q´, and the world demand prices are found as before (P_m´ in the case of soybean meal). We see that the tax on exports of soybean meal reduces the export quantities of both soybean meal and soybean oil; in the case of soybean meal, the reduction is from Q*-q* to Q´-q*. The world demand price for both soybean meal and oil increases, while the price received by Argentine exporters decreases.

It is interesting to note that an export tax on one of two or more joint products shifts the equilibrium quantities and demand prices by smaller amounts than in the case of a similar export tax on a single nonjoint product because equilibrium is determined by the intersection of the joint demand curve (one of whose components would not change) with the marginal cost of the joint product. The story is similar when an export tax is also imposed on soybean oil; the effective joint demand at the supply price would be the sum of the demands at the supply prices. Also, one can see that some large export tax on one of the two joint products would have the same effect on quantities and prices as two smaller export taxes on each of the joint products. Generally, the export taxes decrease equilibrium quantities, raise the world prices paid by foreign buyers, and lower the prices received by exporters.

Data

Argentine production, exports and prices for soybeans, soybean oil, and soybean meal for crop year 2004/05 are shown in table 1. As previously reported, Argentina applied differential export taxes on soybeans, soybean oil, and soybean meal of, respectively, 23.5 percent, 19.3 percent, and 20.0 percent in 2005.

Argentine consumption of soybean oil and meal is minimal; about 9 percent of domestic oil production and less than 1 percent of domestic meal

[12] Note that the difference between the effective demand price and effective supply price is $(1+t_M)p_M - p_M = t_M p_M$.

TABLE 1 Argentine production exports, and prices, crop-year 2005.

Item	Production	Exports	Prices
	Thousands of metric tons (MT)		$ per MT
Soybeans	39,000	10,000	228
Soybean oil	5,115	4,944	471
Soybean meal	22,765	21,100	157

Source: USDA, FAS, Oilseeds: World Markets and Trade, April 2006.

Note: Argentina crushed 29,000 MT of soybeans.

production were consumed in Argentina in 2004/05. Argentina feeds mostly grass to its beef industry. Argentineans consume little chicken and pork, meat products where soybean meal would be used as an input to mixed feed (USDA 2006). Similarly, Argentineans prefer sunflower seed oil and olive oil and similar vegetable oils for food instead of soybean oil.

Parameters must be specified to make the model useful for policy simulations. The shares of soybeans consumed domestically (0.744) and the shares of soybean meal and oil in the demand for the joint product are derived from table 1. The cost share of soybeans (0.82) is from an ITC study that reported the costs of soybeans and total production costs of soymill products in Argentina and Brazil (USITC 1987, tables 8-7, 8-30). Very little information is available concerning elasticities, although the Food and Agricultural Policy Research Institute has some information on supply and demand elasticities.[13] The elasticity of soybean supply (0.2), the elasticities of world import demand for soybeans (-0.30), soybean meal (-0.35) and soybean oil (-0.38) are from the Food and Agricultural Policy Research Institute. No explicit information is known about the elasticity of marginal cost of Argentina's soybean products industry, an elasticity (20) was used that makes the marginal cost curve slope upward, but not greatly so, which is consistent with the belief that Argentina has some power to influence world prices.

[13] From the Food and Agricultural Policy Research Institute searchable elasticity database at http://www.fapri.org/tools/elasticity.aspx.

Results

This section reports the results from four policy experiments using the model and parameters presented in the previous section. First, only the export tax on soybeans is removed; second, the export taxes on soybean products are removed while leaving the export tax on soybeans in place; third, all export taxes are set to 10 percent, and finally all export taxes are removed.

The 23.5 percent export tax on soybeans was totally removed. The largest effects were a decrease in the world price paid by foreign importers and an increase in the export quantity; the price change was dominant due to the inelastic demand (table 2). The domestic exporters' price of soybeans rose slightly, providing an incentive to increase production. Domestic producers/exporters were willing to sell in the domestic market at the same price that they received in the export market. The higher domestic price for soybeans increased the marginal cost of the joint product, which raised the prices of soybean oil and soybean meal. There was a corresponding relatively small decrease in the outputs of soybean meal and oil.

The taxes of 19.3 percent and 20 percent, respectively, on exports of soybean oil and soybean meal were removed, while leaving in place the export tax on soybeans. Elimination of these export tax wedges decreased world prices of soybean oil and soybean meal for foreign importers and increased the domestic exporters' prices while the quantity of these exports expanded (table 3). The effective increases in demands for these products raised the domestic derived demand for soybeans, which resulted in decreased exports of soybeans. The world and domestic prices of soybeans increased, which was an incentive to boost production; this resulted in a relatively smaller fall in the export quantity of soybeans in comparison with the gain in domestic consumption.

TABLE 2 Results from removing the 23.5 percentage export tax on soybeans (percentage change).

	World import price	Export quantity	Domestic or exporters' price	Domestic consumption
Soybeans	-18.0	5.4	1.2	-0.4
Soybean oil	1.0	-0.4	1.0	unchanged
Soybean meal	1.0	-0.4	1.0	unchanged

Source: Calculations from model.

TABLE 3 Results from removing export taxes of 19.3 percent and 20 percent, respectively on soybean oil and soybean meal (percentage change).

	World import price	Export quantity	Domestic or exporters' price	Domestic consumption
Soybeans	3.3	-1.0	3.3	4.8
Soybean oil	-12.7	4.8	3.5	unchanged
Soybean meal	-13.7	4.8	2.9	unchanged

Source: Calculations from model.

TABLE 4 Results from setting export taxes on soybeans, soybean oil, and soybean meal at 10 percent for each product (from 23.5, 19.3 percent, and 20 percent, respectively), (percentage change).

	World import price	Export quantity	Domestic or exporters' price	Domestic consumption
Soybeans	-8.7	2.6	2.3	2.2
Soybean oil	-5.7	2.2	2.1	unchanged
Soybean meal	-6.2	2.2	2.1	unchanged

Source: Calculations from model.

Next, export taxes on soybeans, soybean oil, and soybean meal were all set at 10 percent (by lowering the export taxes on soybeans, soybean oil, and soybean meal, respectively, by 13.5 percent, 9.3 percent, and 10 percent). In each case, decreasing the tax wedges lowered world prices for foreign importers, raised domestic or exporters' prices, and export quantities expanded (table 4).

The effective increases in demands for soybean meal and soybean oil shifted the derived domestic demand for soybeans at the same time that the effective demand for soybeans was increasing in the world market, which raised the producer/exporter price of soybeans and provided an incentive to boost domestic production of soybeans. The higher domestic price of soybeans also increased the marginal cost of the joint product. As both marginal cost and demand for the joint product shifted upward, price changed relatively more than quantity. Joint products could be a reason for maintaining differential export taxes and taxing the co-products proportionally less than other products, but in this case we see roughly similar responses by all products.

Finally the export taxes on soybeans, soybean oil, and soybean meal were totally removed. Qualitatively the effects are similar to the previous reductions but more pronounced. World prices of soybeans and soybean meal decreased while the domestic exporters' price rose with the removal of the tax wedges (table 5). Increases in the domestic price of soybeans shifted the marginal cost of the joint product upward. Because both marginal cost and effective demand for the joint product increased and the demands are inelastic, there is a relatively small increase in the quantity of exports of soybean meal and soybean oil in comparison to their total price changes.

TABLE 5 Results from removing the export taxes of 23.5, 19.3 percent, and 20 percent, respectively, on soybeans, soybean oil, and soybean meal (percentage change).

	World import price	Export quantity	Domestic or exporters' price	Domestic consumption
Soybeans	-14.7	4.4	4.5	4.5
Soybean oil	-11.8	4.5	4.4	unchanged
Soybean meal	-12.8	4.5	3.9	unchanged

Source: Calculations from model.

Conclusion

The Argentine Government has used export taxes to capture some of the gains of the real 60 percent currency devaluation from 2001 to 2002 that otherwise would have accrued to Argentine soybean and soybean product exporters. Because soybeans and soybean products are nearly all consumed outside of Argentina, foreign consumers ultimately pay a portion of the export tax.

Argentine export taxes on soybeans, soybean oil, and soybean meal, as modeled, reduced the quantity of exports by about 4.5 percent for each product. The taxes reduce the quantity of exports, and thereby increase the world price of soybeans. In 2004/05, the 4.5 percent reduction in Argentine exports totaled $340 million, composed of 0.4 MMT of soybeans ($96 million); 0.9 MMT of soybean meal ($145 million), and 0.2 MMT of soybean oil ($100 million).

If Argentina eliminated its 23.5 percent tax on soybean exports, but retained export taxes of 19.3 and 20 percent, respectively, on soybean oil and meal exports, Argentine soybean exports would rise by 5 percent, but its exports of oil and meal would remain largely unchanged (dropping about 1 percent). If Argentina applied a lower, uniform tax rate of 10 percent on all three soybean products, exports of all three products each rise by about 2 percent.

The peso devaluation of 60 percent in real terms likely had a greater effect on Argentine soy exports than export taxes. Because revenues are priced in dollars but many inputs are priced in Argentine pesos, exports would increase as effective excess supply shifts outward. Because soybeans are also exported, producers of soy mill products, however, would have to pay the equivalent of the world dollar price for soybeans, adjusted for taxes, because soybean producers have the alternative of selling directly into the world market. Still, producers of soy mill products would benefit as part of their costs are denominated in pesos.[14] Using the results of another study (Andino, Mulik, and Koo 2005, 13),[15] the 60 percent devaluation would be expected, ceteris paribus, to increase Argentine exports of soybeans and soybean products by about 30 percent. In the four years after the devaluation (marketing years 2001/02 to 2005/06), the combined exports of Argentine soy products rose by 53 percent on a soybean-oil equivalent basis and 38 percent on a soybean-meal equivalent basis.[16]

[14] Although this study has not directly dealt with transport costs, local soy mill producers would face lower transport margins when purchasing soybeans locally.

[15] The estimated elasticity of soybean exports to devaluations in Argentina and Brazilian currency is at 0.50.

[16] This assumes an oil yield of 18 percent, and a meal yield of 80 percent from soybeans, and then adding together separately the oil and meal equivalents. Data from FAS, USDA. This assumes an oil yield of 18 percent, and a meal yield of 80 percent from soybeans, and then adding together separately the oil and meal equivalents. Data from FAS, USDA.

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Appendix

The model used to estimate the effects of altering the export taxes on Argentine soybean products is derived in this appendix. The following constant elasticity specification represents Argentine output or supply of soybeans (y_B).

Equation 1

$$y_B(p_B) = k\, p_B^{\varepsilon}$$

where p_B is the domestic price received by producers (who may also be exporters), k is a parameter based on initial conditions, and ε is the supply elasticity.

Let q_B denote the domestic demand for soybeans, and let Q_B denote the world demand for imports of soybeans, which is a function of the world price. When an export tax is in place, the world price or foreign demand price P_B is separated from the domestic price by the ad valorem export tax t_B; thus $P_B=(1+t_B)\ p_B$. Argentine excess supply of soybeans is set equal to the world demand for imports of soybeans, which is also specified as a constant elasticity relationship, as shown below where the expression for the domestic price is substituted for the world price on the right hand side.

Equation 2

$$y_B - q_B = Q_B(P_B) = K_B\left[(1+ t_B)\, p_B\right]^{\eta}$$

where η is the elasticity of demand for foreign imports of soybeans and K_B is a parameter related to initial conditions.

Because soybean oil and meal are produced in fixed proportions from crushed soybeans and other factors of production, such as labor and capital, a fixed proportions or Leontief production function for the separate outputs of soybean meal y_m and soybean oil y_O might be specified.[17] It is,

[17] Strictly speaking the Leontief production function is not consistent with joint production. See discussion in Christian Bidard and Guido Erreygers. The relevant economic entity is clearly the joint product; see R.P. Manes and Vernon L. Smith, and Roman Weil. Output levels implied by optimizing a joint product profit function generally differ from those obtained by optimizing profit functions for the individual products.

however, more convenient to define the joint product w as the sum of the outputs of soybean oil and soybean meal ($w=y_M+y_O$, where y_M and y_O are scaled as output produced per metric ton of soybeans). The fixed proportions production function for the joint product is-

$$w = \min(\alpha q_B, \alpha_Z z)$$

where z is a component representing other inputs including capital, labor, entrepreneurial expertise, etc., and the αs are positive input-output coefficients.

The most efficient input utilization occurs when $w = \alpha q_B = \alpha_Z z$; no input can be decreased at this point without lowering output, and all inputs must increase to raise output. The cost-minimizing or conditional input demand for soybeans in the joint production of soybean meal and soybean oil is thus $q_B=w/\alpha$, which is independent of price.[18] Substituting this conditional input demand and equation 1 into equation 2 results in equation 3.

Equation 3

$$kp_B^{\varepsilon} = \frac{w}{\alpha} + K_B\left[(1+t_B)p_B\right]^{\eta}$$

The price of soybeans in the domestic market indirectly affects the location of its own demand curve because the marginal cost of the joint product (discussed below) is a function of the soybean price. The associated cost function has the following simple form in which output appears as a function:[19]

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[18] In a model not using the fixed proportions technology, Piggott and Wohlgenant, building on earlier work by Houck, show that the derived price elasticity of domestic demand for soybeans is a harmonic weighted average of the total demand (both domestic and foreign) elasticities for soybean meal and soybean oil. While that relationship does not hold in this model, the derived domestic demand for soybeans shifts with changes in the prices of soybean meal and soybean oil; in effect, domestic demand for soybeans is determined in the output markets for soybean meal and soybean oil.

[19] This small generalization of the Leontief cost function differs from the generalized Leontief functional form which econometricians have long used to permit substitution among inputs. The use here is more in line with Lars-Hendrik Roller. Specifically it permits marginal cost, the relevant supply concept, to slope upward, which is in line with the large country assumption.

Equation 4

$$c(p_B, p_Z, w) = \left(\frac{p_B}{\alpha} + \frac{p_Z}{\alpha_Z} \right) f(w)$$

where p_Z is the composite costs of inputs other than crushed soybeans, and f is a continuous function of w with a positive first derivative (f '> 0).

The domestic demands for soybean meal and soybean oil are believed to be price-inelastic, as discussed, and are denoted by q_M^* and q_O^*, respectively. The rest of the world's demands for imports of soybean meal and oil have constant elasticity specifications similar to the demand for imports of soybeans. These equations are inverted to place them in price terms. The inverse demand for soybean meal, p_M, is shown below.

Equation 5

$$p_M = \left(\frac{Q_M}{K_M} \right)^{\frac{1}{\mu}} \frac{1}{1 + t_M}$$

where p_M is the domestic exporters' price, Q_M is the quantity demanded, t_M is the export tax, μ is the own-price demand elasticity and K_M is a parameter dependent on initial conditions.

There is a similar equation for soybean oil with λ as its own-price elasticity and t_0 as the ad valorem tax on exports or soybean oil.

Then, setting the export supply of the joint product equal to the demands or equivalently setting marginal cost of the joint product equal to the sum of its uses leads to the following equation.

Equation 6

$$\left(\frac{p_B}{\alpha} + \frac{p_Z}{\alpha_Z} \right) f'(w) = q_M^* + q_O^* + p_M(Q_M, t_M) + p_O(Q_O, t_O)$$

where the right-hand side *p*'s are the inverse demands and the *q*'s are the inelastic domestic demands.

Equations 3 and 6 are then totally differentiated and put into proportional change form. The result is shown in equation 7.[20] Note that input prices other than the price of soybeans remain constant and that because the domestic demands for soybean meal and oil are inelastic, they do not change and thus do not enter equation 7.

Equation 7

$$\varepsilon \frac{dp_B}{p_B} = \beta \frac{dw}{w} + (1-\beta)\,\eta \left(\frac{dp_B}{p_B} + \frac{dt_B}{1+t_B} \right)$$

$$\frac{\frac{1}{\alpha} p_B}{\frac{p_B}{\alpha} + \frac{p_Z}{\alpha_Z}} \frac{dp_B}{p_B} + \frac{df'(w)w}{f'(w)} \frac{dw}{w} = \delta_M \left(\frac{1}{\mu} \frac{dQ_M}{Q_M} - \frac{dt_M}{1+t_M} \right) + \delta_O \left(\frac{1}{\lambda} \frac{dQ_O}{Q_O} - \frac{dt_O}{1+t_O} \right)$$

where β is the share of soybeans initially consumed in the domestic market, and δ_M and δ_O are the shares of foreign demands for meal and oil, respectively, in the total demand for Argentinean soybean products.

It is assumed that markets are competitive so that the price of a unit of w is $p_B/\alpha + p_Z/\alpha_Z$; thus, the first term on the left side of the second line of equation 7 equals the cost share of soybeans in the production of the joint product. This cost share is written as γ in the equation 8 below. In the second term, we note that $df'(w)w/f'(w)$ is the inverse of the elasticity of marginal costs, which is written as 1/E in equation 8. The fixed proportions relationship implies that, if one output, say soybean meal, changes, then the output of the joint product changes by an equal proportion because a corresponding proportional change occurs in the output of soybean oil. Although conditions, such as demand for one joint product changing drastically relative to the other one, could invalidate the fixed proportions relationship, it is likely to hold given the current state of affairs and

[20] The proportional change of a variable x is represented by dx/x. Note that the proportional change of a sum equals the sum of its addends weighted by their share of the sum; thus β is the domestic market share of demand for soybeans, and (1-β) is the share that goes to the foreign market. Similarly the δ's represent the shares of demand for soybean meal and soybean oil in the demand for the joint product. This is an example of "Jones algebra" (see Feenstra, 14 and 17).

probable future states. Thus, the fixed proportions relationship and inelastic domestic demands imply that $dw/w = dQ_O/Q_O = dQ_M/Q_M$. Making these substitutions leads to a two-equation system with endogenous variables dw/w and dp_B/p_B and exogenous or policy variables dt_B, dt_M, and dt_O, as shown in equation 8, which, with the parameters substituted in, was used for the simulations.

Equation 8

$$\begin{bmatrix} \varepsilon - (1-\beta)\eta & -\beta \\ \gamma & \frac{1}{E} - \frac{\delta_M}{\mu} - \frac{\delta_O}{\lambda} \end{bmatrix} \begin{bmatrix} \frac{dp_B}{p_B} \\ \frac{dw}{w} \end{bmatrix} = \begin{bmatrix} (1-\beta)\eta \frac{dt_B}{1+t_B} \\ -\delta_M \frac{dt_M}{1+t_M} - \delta_O \frac{dt_O}{1+t_O} \end{bmatrix}$$