

CHANGING TRADE PATTERNS OF FOREST PRODUCTS IN THE UNITED
STATES

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CHANGING TRADE PATTERNS OF FOREST PRODUCTS IN THE UNITED
STATES

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THESIS ABSTRACT
CHANGING TRADE PATTERNS OF FOREST PRODUCTS IN THE UNITED
STATES

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In recent years, a trend has emerged in the trade of forest products in the United States. As witnessed in many other industries in the U.S. over the past several decades, forest products exports have steadily dropped off in many instances while imports have continued to increase. The changes taking place have brought about a wave of uncertainty concerning the future of the forest products and transportation industries.

In this paper, I collected, analyzed, and compared import and export data on five different forest products categories for the years 1996 and 2006 in order to depict the recent changes taking place. Although values and changes vary across the different product categories, the trend of increasing imports and the rising trade deficit in forest products is especially evident. Furthermore, changes in trade partners as well as new and emerging trade patterns stand out.

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INTRODUCTION

In recent years, a trend has emerged in the trade of forest products in the United States. As witnessed in many other industries in the United States over the past several decades, forest products exports have steadily dropped off in many instances while imports have continued to increase. Historically, forest products exports were the major player. However, there is a national trend where imports are dramatically increasing (Adams 2005). These changing trade patterns have not only affected the United States, there have been changes emerging worldwide.

The global picture of trade in wood products has changed substantially with the emergence of China, the Russian Federation, Eastern Europe, and several Southern Hemisphere countries as major traders (Hashiramoto et. al 2004). Wood products manufacturing is shifting from developed to developing nations (Bowyer 2004). Imports into the United States from numerous countries have substantially increased accounting for at least part of the decline in production and exportation of forest products in virtually every category (Hashiramoto et. al 2004).

According to Bowyer (2004), there are at least four major factors driving this change. Globalization is shifting industrial capacity to countries where costs are lower. The extensive development of fast growing tree plantations and the rapid emergence of new supplies of industrial wood are bringing stronger American reliance on imported foreign products. The relatively recent and ongoing development of wood-based

composite products technology is driving change. Finally, the emergence of new important players in wood products manufacturing and consumption – especially China, but also other Asian countries, the Russian Federation, Eastern Europe, and some countries in Latin America are all causing change to forest products trade patterns in the United States. The changing patterns of trade in forest products are very real issues facing forest and transportation industries throughout the United States and across the globe.

The forest industry sector contributes significantly to the national economy in the United States. The forest industry sector alone contributes \$243 billion annually to the economy and employs 1.1 million people. Forest industry manufacturing represents 7% of the United States' entire manufacturing base. In 46 of the 50 states, the sector ranks in the top 10 of manufacturing sectors. Furthermore, the forest industry converts 300 million tons of timber per year into industrial and consumer products (Winistorfer 2005). The growing number of forest product imports and declining number of forest products exports could have wide-ranging implications for the forest products sector.

With a growing reliance on imported forest products, there is less demand for domestic products and a domestic industry. One obvious implication of this is a substantial decrease in the United States' forest products industry which has already resulted in mill closings and job losses throughout the country (Bowyer 2004). Today, some 82 pulp mills in the Southern U.S. risk closure in the face of heavy competition (Ferrill 2006). This has forced a reassessment of long-established manufacturing and marketing strategies in the United States (Bowyer 2004). Along with the reassessment, is the vital need for more information on the changes taking place. Therefore, my goal in

this thesis is to analyze data collected on forest products imports and exports into and out of the United States in order to provide some of this information.

I collected, analyzed, and compared import and export data on five different forest products categories for the years 1996 and 2006 from the U.S. International Trade Commission in order to depict the recent changes taking place. The product categories analyzed included lumber, pulp, paper, plywood, and veneer and are well representative of the numerous forest products categories. Although values and changes vary across the different product categories, the trend of increasing imports and the rising trade deficit in forest products is especially evident. Furthermore, changes in trade partners as well as new and emerging trade patterns stand out.

LITERATURE REVIEW

While there have not been a large number of studies done involving trade patterns of forest products into and out of the United States, the onslaught of change and uncertainty to the American forest products sector is here. There is substantial evidence of change taking place in the United States' role as a worldwide leading exporter of forest products (Winistorfer 2005, Hashiramoto et. al 2004, Bowyer 2004, Adams 2005, Arda 2004, Ferrill 2006, Peck 2002). According to the U.S. International Trade Commission in its publication Conditions of Competition in U.S. Forest Products Trade, U.S. forest products producers face increased competition in foreign markets.

Previous research has touched on bits and pieces of the new and emerging forest products trade patterns. However, researchers have thus far failed to paint an overall picture of the changes taking place for the major forest products categories imported into and exported out of the United States. Much of the work done has either focused on certain regions such as the U.S. South, or taken a global perspective and only touched on some of the change taking place in the U.S. Other research has focused on barriers and policies affecting trade, or else focused on a particular product. Furthermore, much of the work that has been done is now dated.

Haas et. al (1997), Hammett et. al (1993), and Luppold (1994) have all provided insight into international opportunities for U.S. hardwood exports. Hammett et. al (1993) even predicted the abundant hardwood resource in the U.S. South would create American

manufacturing jobs, reduce the trade deficit, and make hardwood silviculture more profitable. Thirteen years later, those predicted opportunities are not quite panning out. However, when combined with more recent research, these studies do help depict changing patterns and opportunities in trade. For example, one major change depicted in the hardwood market deals with walnut exports. In 1970, walnut log exports accounted for 77 percent of the value of log exports. Today, that value is less than 10 percent (Luppold 1994).

Wisdom (1977) depicted much of the international forest products trade patterns associated with the U.S. South. In 1974, the total value of exports from the eight southern customs districts (Norfolk, Wilmington, Charleston, Savannah, Miami, Tampa, Mobile, and New Orleans) amounted to \$858 million. Over half of the total value of exports went to Europe. Latin America had the second largest market, purchasing almost one-fourth of the total exports. Wisdom predicted that the future prospects for the export of southern forest products would largely depend upon what happened in the major wood producing and trading countries of Canada, Europe, Brazil, Japan, and the former Soviet Union, and how the South responded to these developments (Wisdom 1977). More recent research suggests that future wood products production and consumption patterns are likely to be driven by developments in China, elsewhere in Asia and the Pacific region, Latin America, South Africa, the Russian Federation and eastern Europe (Bowyer 2004). Today, some 82 pulp mills in the Southern U.S. risk closure in the face of heavy competition. Fundamental changes are occurring in the demand/supply of balance for pulpwood in the southern United States (Ferrill 2006). China, which was not even considered in the mid-1970s as a potential competitor in the forest products industry is

now the largest emerging competitor of finished wood products. However, as predicted by Wisdom (1977), Russia and Brazil have taken roles as leading competitors in international forest products trade (Adams 2005).

Many global studies have touched on the United States role in the global forest products industry. Peck (2002) identified North America's main external markets as those of East Asia and Europe. Important changes have occurred in the pattern of trade flows over the past few decades resulting from the opening up of new forest areas, the over-exploitation of others, the building of new wood-processing capacities, or changes in import demand. For forest products as a whole, the nominal value of world trade increased by 186 percent from 1983 to 1997. Intra-North American trade and North American exports to Asia-Pacific and Europe expanded more slowly than the world average (Peck 2002). Imports into the United States of secondary processed wood products from countries such as Indonesia, Malaysia, Brazil, Thailand, Mexico, Viet Nam, and the Philippines have steadily risen since 1990 (Hashiramoto et. al 2004). "Recent loss of manufacturing infrastructure for some sectors of the North American forest industry, coupled with rising imports of timber, wood, and fiber have brought a wave of change and uncertainty to many sectors of the industry" (Winistorfer 2005).

The world's largest plywood producer, the United States, decreased its production between 1998 and 2003. On the other hand, China's production quadrupled during the five year period. Furthermore, China surpassed the U.S. as the world's largest producer of fiberboard (Hashiramoto et. al 2004). The United States has typically been a net exporter of forest products (Puttock et. al 1994). However, according to Peck (2002), the U.S., although still a major exporter; is now a net importer. In fact, the United States is

the largest importer of wood products in the world with \$25.7 billion in 2000 (Peck 2002). According to the U.S. International Trade Commission (ITC) in its publication Conditions of Competition in U.S. Forest Products Trade, forest products exports declined 16 percent from 1995 to 1998. Further significant movement of the domestic manufacturing base to offshore facilities, would lead to the United States becoming a net importer of both raw materials and finished forest products (Winistorfer 2005).

Chinese manufacturers have already been successful in penetrating the high-value markets of the United States, with the U.S. being the destination of over 50 percent of its exports (Hashiramoto et. al 2004). Partly as a result of a 2,366 percent increase in the value of Chinese furniture exports to the United States from 1993-2003, hardwood timber consumption by the U.S. furniture industry has been reduced by over 60 percent in just the past five years (Meyer 2004). According to the ITC, the value of imports from China increased over 26 percent in 2005 alone and has China in position to possibly become the top supplier to the U.S. market. Furthermore, the rapid expansion of China's printing and publishing industry was evident as U.S. imports of printed matter from China increased at an annual rate of 28 percent between the years of 2001 and 2005 (USITC 2007). Other changes have also been noted by the ITC.

A study done by the U.S. International Trade Commission reported on several shifts in forest products trade from 2004 to 2005. It notes that the trade deficit increased for the sixth consecutive year (increased \$240 million from 2004 to 2005). Modest gains in forest products exports for the year were linked to favorable exchange rates and strong foreign demand for raw materials. Although Canada remained the United States' largest sector trading partner, large shifts in U.S. forest products trade in recent years were

linked to the rapid expansion of China's forest products industry. Bilateral trade between China and the U.S. posted the largest gain in 2005, increasing by \$1.4 billion.

Furthermore, the U.S. trade surplus in forest products with Latin America reversed the declining trend in 2005 with increased exports to Mexico and other countries offsetting the growing imports from Brazil (USITC 2007).

With new trade liberalization policies, and worldwide rapid economic growth in many parts of the world, the volume and value of global trade is expected to grow faster than production (Bolkesjo and Buongiorno 2005). Peck (2002) linked much of the change taking place and predicted to continue to take place to issues such as specialization in production, globalization, advances in communications, and the establishment of plantations of fast growing species. Tariff reductions and trade agreements have also been linked to many of the changes taking place (Gan and Ganguli 2003, Puttock et. al 1994). They will change the terms of trade, affecting the international competitiveness of a country's industries. U.S. forest products industries are likely to be affected by trade liberalization and regional economic integration (Gan and Ganguli 2003). Gan and Ganguli (2003) also pointed out that liberalization of foreign markets could stimulate U.S. exports. However, U.S. domestic regulations at the Federal, State, and local levels are reducing U.S. export capacity insofar as public and private landholders both must reduce logging in order to comply with environmental management criteria (Freese 1998). Developing countries can also expect important increases to their export markets from the reduction in tariffs and trade liberalization (Puttock et. al 1994).

The flow of capital investment to new producing regions and growing global competition in forest products markets is forcing a reassessment of long-established manufacturing and marketing strategies particularly in North America (Bowyer 2004). The United States' share of global solid wood products is expected to remain under pressure. Developers and contractors in the United States increasingly are looking to foreign markets to meet their softwood lumber needs as sales from Federally-held forests have been reduced by 84 percent in the past ten years (Freese 1998). The issue of concern for the United States is the ability to competitively manufacture and the supply chain impacts on the rest of the forest system which could result from the loss of manufacturing base. The prevailing domestic thought is that American producers must move up the value-chain if they are to sustain the manufacturing base and economic output from the sector (Winistorfer 2005). For example, in the United States, the federal government and the pulp and paper industry have cooperatively designed and funded research programs to develop new approaches which have resulted in radical new thinking about the future nature of paper manufacturing (Bowyer 2004). Further research into the area will further assist sectors such as the pulp and paper industry developing new approaches to business and manufacturing practices.

DATA

The data used in this study was collected from the United States International Trade Commission (ITC). I collected annual import and export data on five different product categories for the years 1996 and 2006. The product categories included in my thesis consist of lumber, pulp, paper and paper articles, plywood, and veneer. All data was collected as current values in U.S. dollars. In order to compensate for inflation and adjust real and nominal values, the Cost of Living Index was used from the Bureau of Labor and Statistics.

Because this study focuses on recent changes in the United States' forest products trade, the years 1996 and 2006 were chosen to study the changing import/export mix. All of the data collected from the ITC are annual totals. At the time of this study, 2006 provided the most recent year for complete annual totals. By going back a decade to 1996, this data allowed me to depict many of the new and emerging trade patterns taking place.

The five product categories analyzed in this study are well representative of the various forest products categories. In addition, they cover many of the heavily traded forest products commodities. Below is a list of definitions from the Harmonized Tariff Schedule (HTS) for the five categories used in my thesis:

Lumber (HTS – 4407): Wood sawn or chipped lengthwise, slice or peeled, more than 6mm (.236 in.) thick

Pulp (HTS – 47): Pulp of wood or other fibrous cellulosic material; recovered (waste and scrap) paper and paperboard

Paper and Paper Articles (HTS – 48): Paper and paperboard; articles of paper pulp, paper or paperboard

Plywood (HTS – 4412): Plywood, veneered panels and similar laminated wood

Veneer (HTS – 4408): Veneer sheets and sheets for plywood and other wood sawn lengthwise, sliced or peeled, not more than 6mm (.236 in.) thick

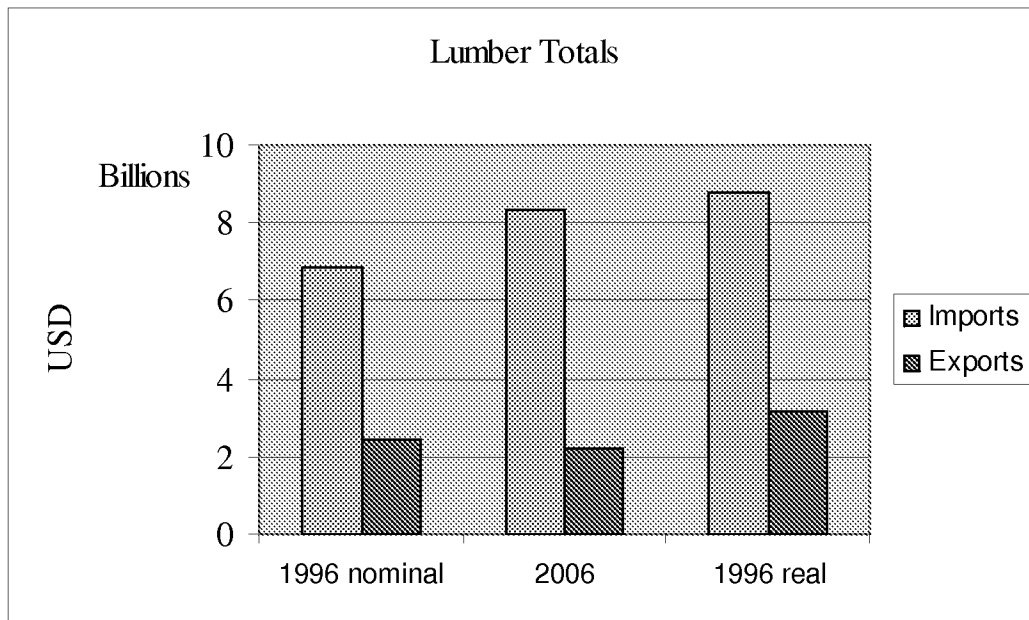
As stated earlier, all data was collected as values in U.S. dollars. Due to inflation and fluctuations in the value of the dollar over time, the Cost of Living (CoL) index was used to convert nominal values to real values. Using the base period 1982-1984, the CoL index for 1996 was 156.9, and the CoL for 2006 was 201.6. Multiplying the ratio of these two values enables me to convert either a 1996 value up to a 2006 equivalent or vice versa. Because a dollar in 1996 was worth more than a dollar in 2006, real values, in essence, enable you to compare “apples to apples.” This is extremely beneficial when comparing changes over time.

PATTERNS OF IMPORT/EXPORT ACTIVITIES OF SELECTED WOOD
PRODUCTS CATEGORIES: 1996-2006

Lumber:

The value of the United States annual lumber imports rose in nominal terms from \$6.83 billion in 1996 to \$8.32 billion in 2006. However, after adjusting to real values using the Cost of Living index, there was actually a 5.13% decrease in the value of imported lumber from \$8.77 billion in 1996 to \$8.32 billion in 2006. The value of exports dropped off in both real and nominal terms from 1996 to 2006. In nominal terms, exports declined from \$2.43 billion to \$2.21 billion. However, at 29.17 %, there was an even larger decrease in the value of exports in real terms from an adjusted \$3.12 billion in 1996 to \$2.21 billion in 2006. Although a trade deficit in lumber products was already present in 1996, it increased nearly 40% over the ten year period to \$6.11 billion (see figure 1)!

Figure 1. Total value of U.S. lumber imports and exports in USD for 1996 and 2006



Although their market share as well as their value of lumber exported to the United States decreased from 1996 to 2006, Canada remained the largest single originating country of U.S. lumber imports. The top five originating countries of U.S. lumber imports in 1996 consisted of Canada, Brazil, Mexico, Chile, and New Zealand with Canada providing 93% of the total value of imports (see figure 2). Many of these top trading partners consisted of Latin American countries. Move to 2006, and the emergence of some European countries as key players is evident.

In 2006, the top five originating countries of U.S. lumber imports consisted of Canada, Germany, Chile, Brazil, and Sweden with Canada providing 76% of the total

value of imports (see figure 3). However, out of these top five trading partners, Canada was the only country with a decrease in value traded from 1996-2006. Germany and Sweden, who were not even in the top twenty in 1996, substantially increased their trade in lumber with the U.S. to claim top five positions. Chile and Brazil also increased their lumber imports into the United States to maintain dominant positions as two of the United States top 5 trading partners for lumber imports. China was another country that significantly increased its exports to the U.S. to move from the bottom of the list into eighth position among leading importers. While these countries showed gains in the value traded, Mexico fell precipitously in the ten year period and was not even one of the top twenty exporters of lumber to the U.S. in 2006. However, potential explanations for this may lie within the export side of the market.

Figure 2. Top 5 countries of origin for U.S. lumber imports in 1996

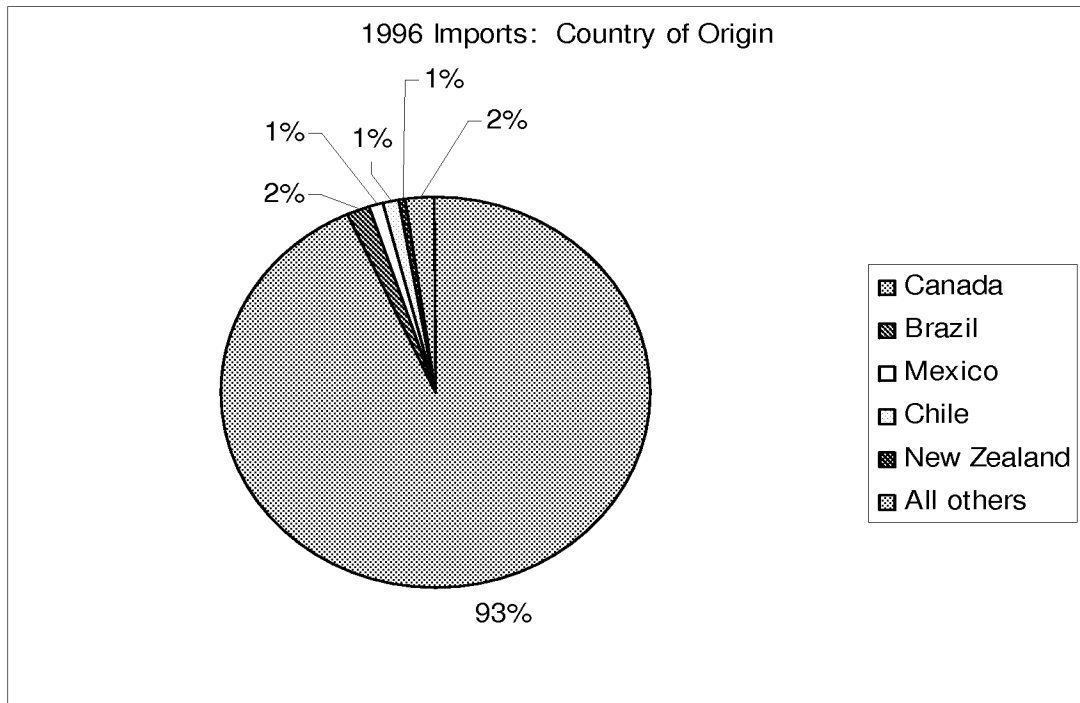
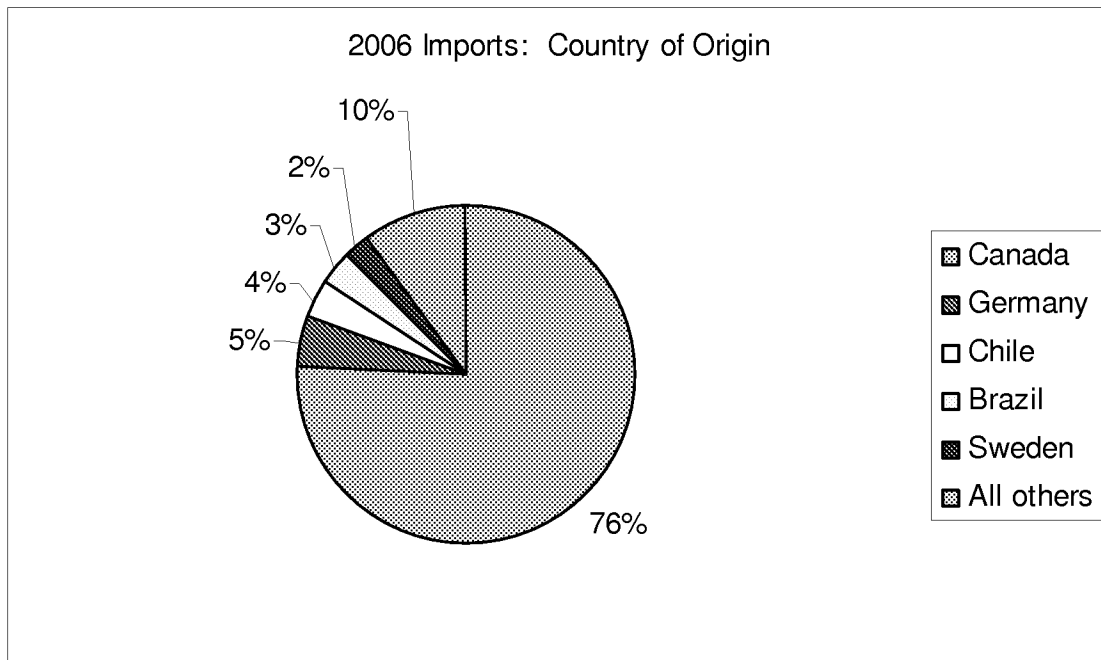


Figure 3. Top 5 countries of origin for U.S. lumber imports in 2006



Japan, Canada, Italy, Spain, and Germany accounted for the top five destinations of U.S. lumber exports in 1996 (see figure 4). In contrast to our lumber imports, our exports were not so overwhelmingly dominated by one country. However, Japan did account for 32% of the U.S. based exports. Most of the destinations for U.S. based lumber exports were dominated by European, Asian, and North American countries. Move to 2006, and much of our export trade is still dominated by these regions. However, there are some key differences when looking at individual countries and their effect on the U.S. lumber export market.

In 2006, the value of lumber exported to Japan declined in nominal terms by almost 90% dropping Japan from the top destination of U.S. lumber exports to the sixth position (see figure 5). The top five export destinations in 2006 consisted of Canada, China, Mexico, Spain, and Italy. Canada, China, and Mexico all clearly increased the amount of lumber imported from the United States while Spain and Italy remained pretty steady and held on to the top five positions as key destinations for U.S. lumber exports. The significant increases in lumber exported to Mexico and Canada is consistent with the decrease witnessed in the value of lumber imported into the United States from these two countries over the decade. China not only made a run on the import side of the market, but have also clearly climbed the ladder as a premier destination for U.S. lumber exports. In 1996, China was not among the top twenty destinations for U.S. lumber exports. However, in 2006, China moved into the number two position accounting for 13% of all U.S. based lumber exports! Form this immense set of trade data, some key trends and changes are evident.

Figure 4. Top 5 destination countries for U.S. lumber exports in 2006

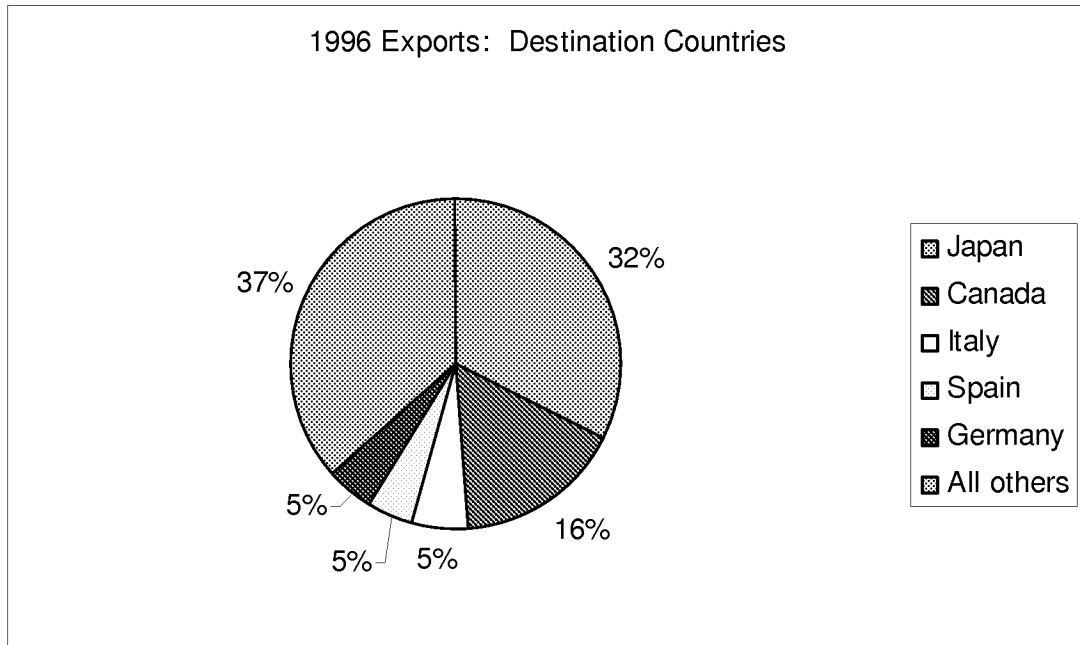


Figure 5. Top 5 destination countries for U.S. lumber exports in 2006



Overall, the net deficit in the United States lumber trade increased between the years of 1996 and 2006. Not only that, the value of exports dropped in both real and nominal terms. Canada is clearly the United States largest trading partner in lumber. However, the emergence of China as a significant presence in both the import and export side of trade was clearly evident over the ten year period. A shift was also witnessed in the trade with Canada and Mexico. Imports from both countries notably dropped off while exports to both countries considerably increased. With the emergence of some European countries on the import side of the trade, imports (with the exception of Canada) are now predominately made up of European and Latin American countries. On the other hand, export destinations consist mainly of North American countries along with Asian and European destinations.

Table 1. Aggregate lumber import and export data for 1996 and 2006

U.S. Lumber Imports

	1996 Imports		2006 Imports
Canada	6377961004	Canada	6296050187
Brazil	112914921	Germany	401686380
Mexico	80843783	Chile	317418670
Chile	64738214	Brazil	271785115
New Zealand	46383576	Sweden	193042889
Bolivia	34923296	New Zealand	181188115
Malaysia	21615460	Austria	95267928
Peru	10869556	China	68349660
Indonesia	8737131	Peru	61833964
		Czech Republic	44332386
Argentina	6342149	Argentina	41068164
Ghana	5950533	Malaysia	31126753
Ecuador	5238910	Lithuania	29277398
Finland	4361040	Ecuador	28558612
Burma	4139741	Russia	28413581
Singapore	3856729	Ghana	24201610
Honduras	2881742		

Guatemala	2824505	Cameroon	20496217
Nicaragua	2720505	Uruguay	20065182
Philippines	2580511	Bolivia	17791309
Thailand	2570023	Indonesia	13924853
Subtotal	6802453329	Subtotal	8185878973
All others	26739335	All others	135723192
Total	6829192664	Total	8321602165

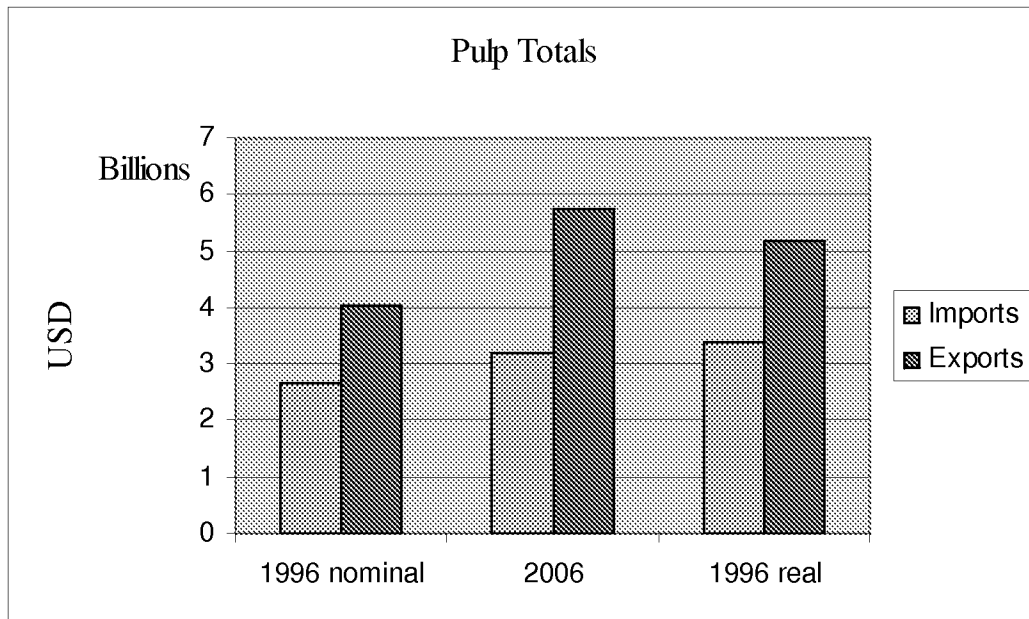
U.S. Lumber Exports

	1996 Exports		2006 Exports
Japan	788124938	Canada	541274772
Canada	395442363	China	297526456
Italy	129972292	Mexico	233594848
Spain	112797169	Spain	128142348
Germany	110215837	Italy	122539410
Mexico	102188647	Japan	98153540
United Kingdom	82516570	United Kingdom	90264728
Korea	72840167	Germany	45435155
Taiwan	66179655	Vietnam	43689866
		Dominican Rep	38333158
Belgium	64589191	Taiwan	37022866
Hong Kong	45576698	Hong Kong	36738915
Australia	36774962		
Dominican Rep	36347150	Portugal	33534382
France	31767353	Ireland	31037189
Netherlands	30949997	Indonesia	29530984
Jamaica	25621428	Thailand	28471439
Thailand	23217869	Philippines	27175736
South Africa	19840669	Sweden	21419191
Philippines	19183881	Denmark	21332295
Saudi Arabia	16404077	Belgium	20884414
Subtotal	2210250913	Subtotal	1926101692
All others	219922894	All others	284267690
Total	2430173807	Total	2210369382

Pulp:

Unlike lumber and many other product categories, a trade surplus exists for pulp in the United States (see figure 6). In fact, it actually increased in nominal and real terms over the ten year time-frame this study covers from \$1.39 billion in 1996 to \$2.55 billion in 2006. In nominal terms, the value of both imports and exports rose as well. Imports increased from \$2.65 billion to \$3.18 billion while exports increased from \$4.03 billion to \$5.74 billion. However, when looking at the values in real terms, the value of pulp imports actually decreased from an adjusted \$3.42 billion to \$3.18 billion. In contrast, even after adjusting to real terms, the value of pulp exports still showed gains from an adjusted \$5.18 billion to \$5.74 billion.

Figure 6. Total value of U.S. pulp imports and exports in USD for 1996 and 2006



Similar to lumber and various other forest products categories, Canada was the number one exporter of pulp to the United States in 1996 (see figure 7). And once again, their dominance was overwhelming. Approximately 84% of all pulp imported into the United States in 1996 originated from Canada! The only other seemingly significant country on the list was Brazil which accounted for 11% of pulp imports in 1996. South Africa, Chile, and New Zealand rounded out the top five with numerous European countries close behind.

By 2006, Canada and Brazil remained dominant as the leading exporters of pulp to the United States (see figure 8). Although Canada's control of pulp imports weakened, their dominance remained overwhelming with 76% of the total pulp imports. In nominal terms, pulp imports from Canada increased approximately 8% from \$2.21 billion to \$2.40 billion. However, in real terms, imports from Canada decreased nearly 16%! Unlike

Canada, Brazil's share of the trade increased from 11% to 18%. Furthermore, the value of pulp imports from Brazil more than doubled from \$277 million to \$578 million!

Finland, Sweden, and South Africa made-up the remainder of the top five countries in 2006 for pulp imports. And like 1996, numerous other European countries were present in the top twenty. Finland and Sweden showed huge gains in the value of pulp exported to the U.S., while South Africa nearly cut its trade in half and dropped from third position down to number five. Other significant decreases in pulp imports came from Chile and Mexico. The value of imports from Chile decreased by approximately \$2 million in nominal terms and resulted in Chile dropping out of the top five. Similar to lumber, pulp imports from Mexico also fell significantly and were only nearly one-third of what they were in 2006. Yet, losses in the value of imports from Mexico and some other countries were accounted for in gains on the export side of the U.S. pulp trade.

Figure 7. Top 5 countries of origin for U.S. pulp imports in 1996

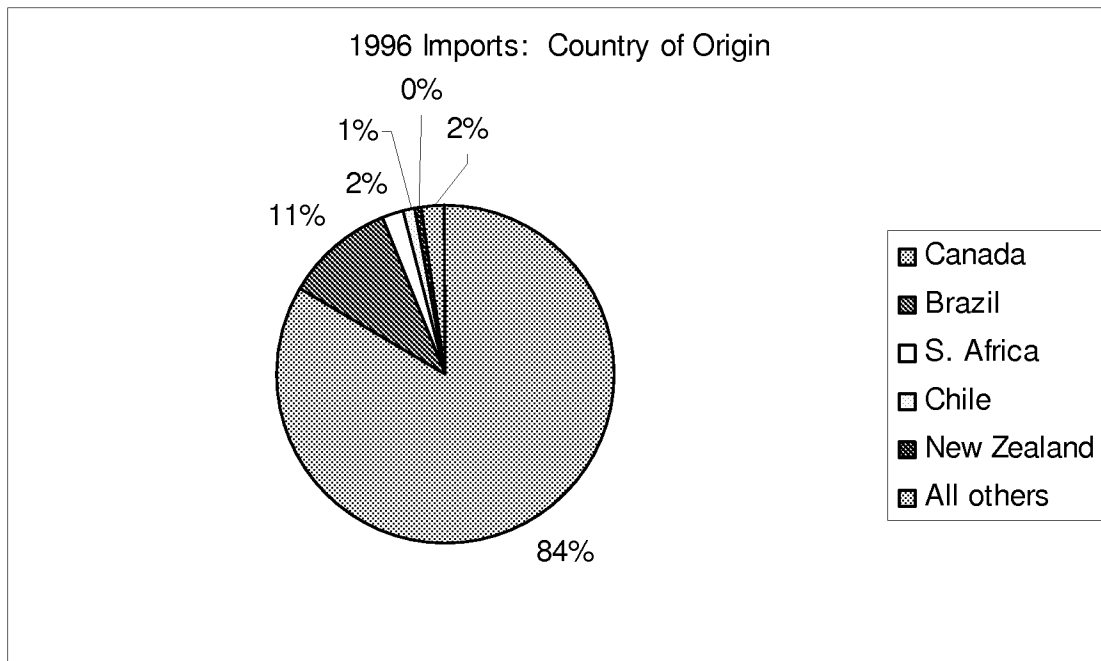
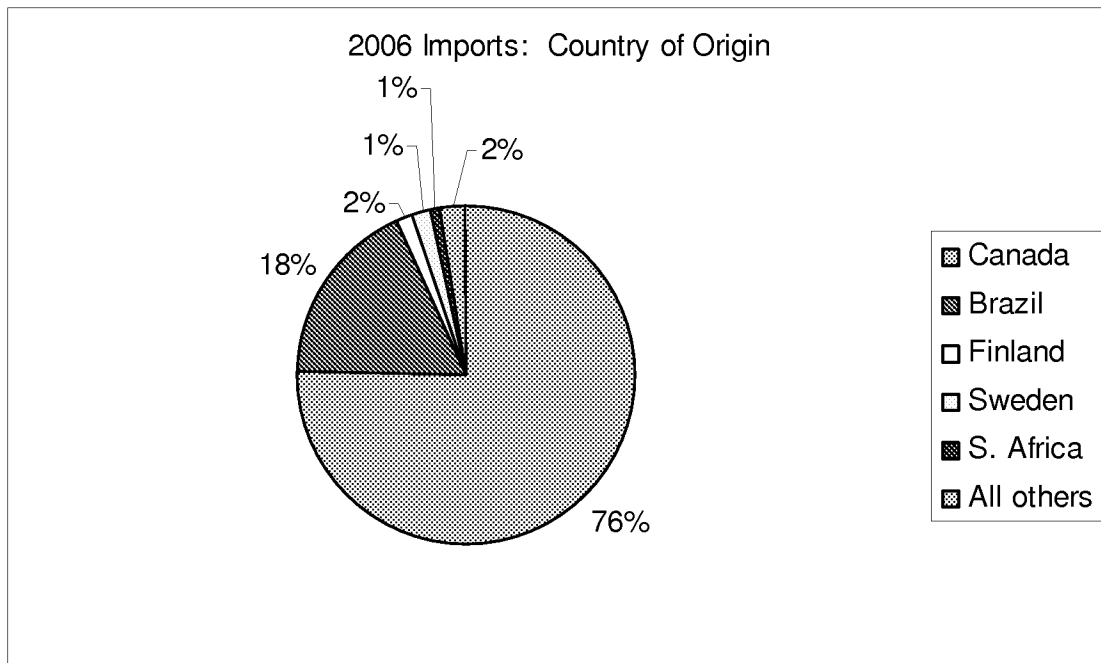


Figure 8. Top 5 countries of origin for U.S. pulp imports in 2006



Unlike pulp imports, in 1996, exports from the United States were not dominated by one or two countries. Japan, Korea, Mexico, Italy, and Canada were the top five destinations for U.S. pulp exports with Japan accounting for 14% of the trade (see figure 9). Once again, many of the exports were destined for Canada and Mexico, or other countries located in Asia and Europe. By 2006, much of the pulp exports were still destined to these regions. However, there were some substantial changes that took place.

Similar to changes in various other forest products, the value of pulp exported to Japan dropped off from 1996 to 2006. This removed Japan as the premier destination of U.S. pulp exports and landed them the number four position. Instead, China once again emerged out of nowhere to claim the top position. Exports to Korea also decreased, and were nearly cut in half moving Korea out of the top five. Additionally, a decline in exports to many European destinations such as Germany, the United Kingdom, and France was witnessed. On the contrary, exports increased to many countries.

In 1996, China was ranked 10th among the top twenty countries for U.S. pulp exports. By 2006, China was not only the number one destination, they accounted for 26% of all U.S. based pulp exports (over 2 ½ times more than any other country)! While imports from Canada and Mexico dropped over the ten year period, exports to these countries picked up significantly with the value of pulp exported to Mexico nearly doubling. Italy also showed considerable increases moving up to the number three position. The remainder of the exports were once again destined primarily to Asian and European countries.

Figure 9. Top 5 destination countries for U.S. pulp exports in 1996

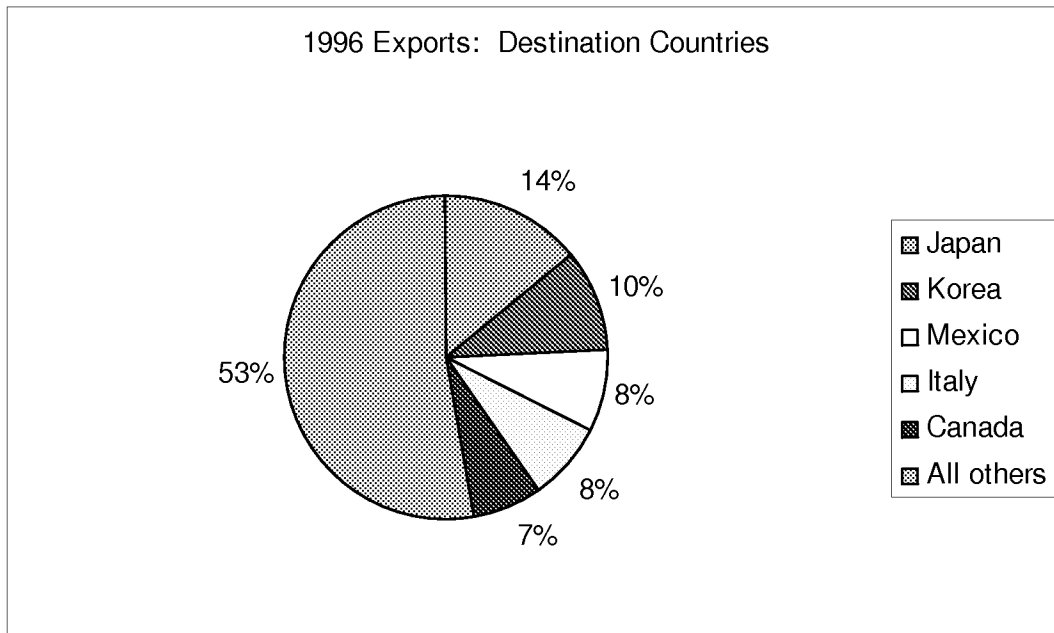
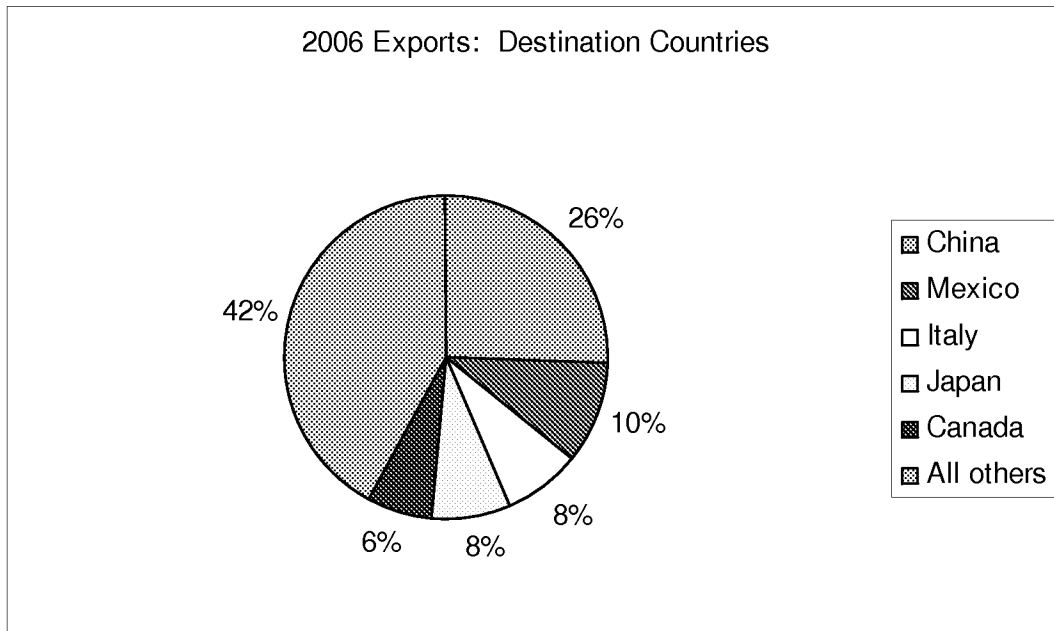


Figure 10. Top 5 destination countries for U.S. pulp exports in 2006



When looking at the United States' overall pulp trade between 1996 and 2006, there are some central patterns and changes that emerge. The trade surplus in pulp rose over the ten year period thanks in large part to China. This is also very different from the other forest products categories where the United States is a net importer. Imports from Brazil and European countries seem to be on the rise while imports from Canada and Mexico seem to be on a decline. However, like so many other product categories, U.S. pulp imports remain dominated by Canada. Where imports from Mexico and Canada dropped off, the slack was picked up by the increase in value of exports to these two countries. China once again emerged as a major player establishing its control over U.S. based pulp exports. On the contrary, Japan once again dropped off as the premier destination for U.S. exports. Furthermore, exports destined for many European countries seem to be on a decline.

Table 2. Aggregate pulp import and export data for 1996 and 2006

Pulp Imports

	1996 Imports		2006 Imports
Canada	2209483268	Canada	2390687068
Brazil	276838842	Brazil	577830644
South Africa	60968075	Finland	55390883
Chile	27356126	Sweden	47518508
New Zealand	12224657	South Africa	33535887
Mexico	11295348	Chile	25585690
Sweden	8793573	Indonesia	10679427
Spain	7020365	Spain	7327504
Indonesia	7015297	France	7285502
Finland	6676230	Mexico	4362049
Germany	6189877	Germany	4328391
United Kingdom	3547934	Costa Rica	2784901
Singapore	3019790	Russia	2780835
Swaziland	2861987	China	2555364

Philippines	790485	Philippines	1769204
Thailand	727894	Norway	1674063
		United	
Russia	567757	Kingdom	1361738
Taiwan	554418	Pakistan	923568
Netherlands	467346	Swaziland	859791
Tunisia	344773	Israel	517539
Subtotal	2646744042	Subtotal	3179758556
All others	1402713	All others	1774811
Total	2648146755	Total	3181533367

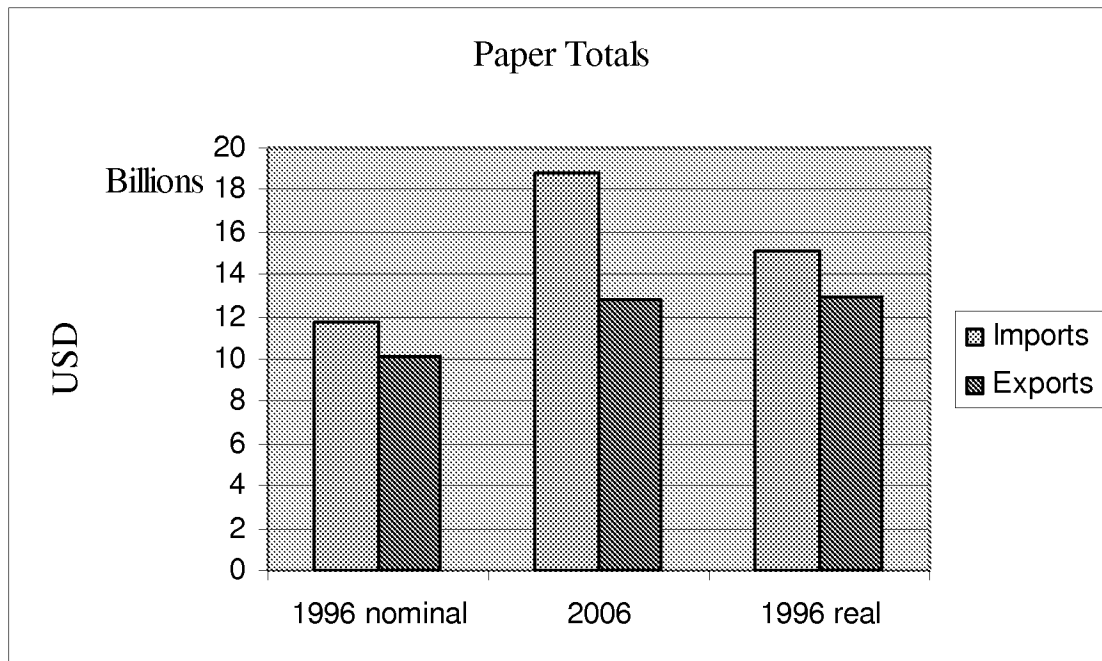
Pulp Exports

	1996 Exports		2006 Exports
Japan	574114028	China	1473231086
Korea	410319226	Mexico	580306497
Mexico	327379534	Italy	447761347
Italy	312732690	Japan	446226676
Canada	278642959	Canada	363510983
Germany	258554173	Korea	274593368
United			
Kingdom	205331042	Germany	245687719
		United	
France	198682282	Kingdom	178017112
Taiwan	195758542	Netherlands	164935672
China	186995173	India	156544908
Netherlands	141257436	France	140036493
Indonesia	114503100	Taiwan	102246345
Spain	76659816	Brazil	94873742
Brazil	73576404	Belgium	90852356
Venezuela	70903743	Indonesia	86266280
Thailand	67196659	Spain	83703480
Belgium	66958308	Turkey	82376486
India	56966359	Thailand	75812059
Argentina	40170353	Poland	55228498
Saudi Arabia	37599994	Sweden	43836702
Subtotal	3694301821	Subtotal	5186047809
All others	340098865	All others	550162221
Total	4034400686	Total	5736210030

Paper & Paper Articles:

Paper and Paper Articles represent another forest products category traded in the United States where a trade deficit is not only present, but also on the rise (see figure 11). Although the value of imports and exports rose between 1996 and 2006 in nominal terms, paper exports actually witnessed a slight decrease when compared in real terms. In nominal terms, the value of imports increased nearly 60% to \$18.79 billion while exports increased only 27% to \$12.83 billion. However, in real terms the value of paper exports decreased more than \$100 million. Finally, the United States' trade deficit in paper and paper articles increased more than 250% to nearly \$6 billion!

Figure 11. Total value of U.S. paper imports and exports in USD for 1996 and 2006



Once again, Canada showed its dominance in United States forest products imports. In 1996, Canada represented 72% of all paper products imported into the United States (see figure 12). Finland, Germany, Mexico, and the United Kingdom followed Canada in the value of paper and paper articles exported to the United States. Although Japan and China ranked sixth and seventh consecutively, the majority of the other countries represented in the top twenty consisted of European nations. However, in ten years significant gains would be witnessed from several non-European countries.

The value of paper imports increased approximately \$7 billion dollars by 2006 with gains in trade from numerous countries (see figure 13). Not surprisingly, Canada remained the leading exporter of paper products to the United States and accounted for 55% of the total paper imports valued at nearly \$10.5 billion! However, China once again emerged as a major player and the value of its paper imports into the United States

increased almost 600%. This moved China from seventh position in 1996 to second in 2006 where it accounted for 10% of the total value of paper imports. Finland, Germany, and Mexico rounded out the top five in 2006 and also showed significant gains in the value of paper exported to the United States. In contrast, imports from the United Kingdom dropped off over the ten year period moving the country out of the top five down to the eleventh position. Although many of the top twenty countries for paper imports still consisted of European nations in 2006, several non-European countries showed significant gains.

In addition to China, Korea, Brazil, and Indonesia all moved up in the top twenty while Japan held steady as the sixth largest exporter of paper to the United States. Korea moved from thirteenth to seventh while increasing the value of its paper imports approximately 600%. Brazil jumped from fifteenth to eighth with gains of almost \$200 million. Finally, Indonesia also showed gains of almost \$200 million dollars moving them from nineteenth up to twelfth.

Figure 12. Top 5 countries of origin for U.S. paper imports in 1996

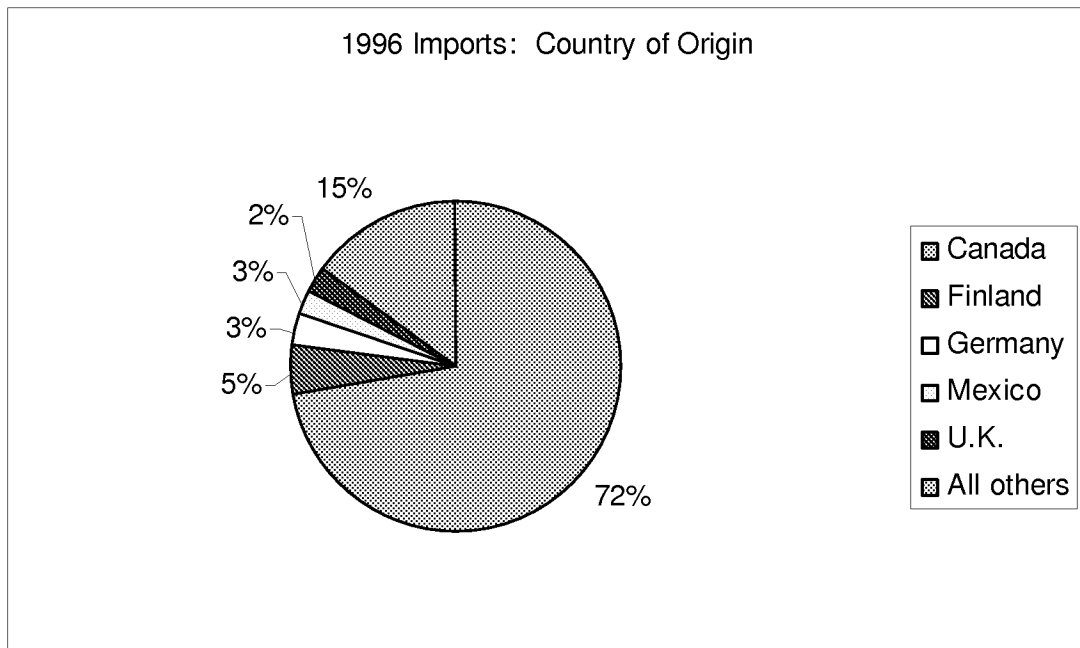
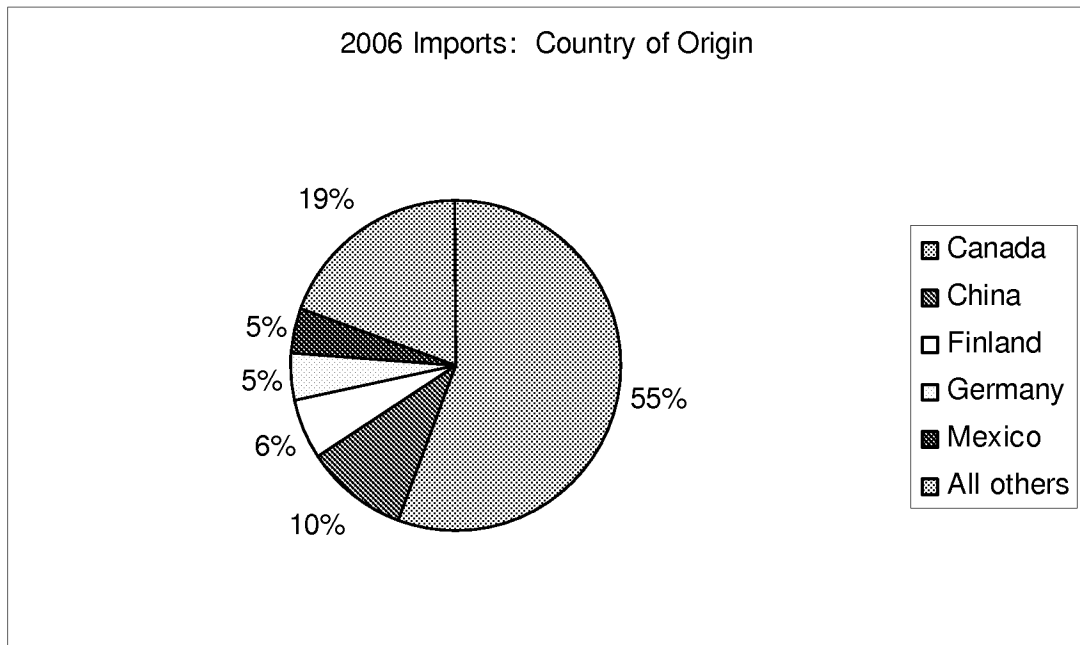


Figure 13. Top 5 countries of origin for U.S. paper imports in 2006



Like the import side of the market, paper exports were also dominated by Canada. In 1996, Canada accounted for 27% of U.S. paper exports or roughly \$2.7 billion. Mexico, Japan, Hong Kong, and the United Kingdom followed Canada with a wide array of destinations rounding out the top twenty (see figure 14). Other than Canada, Mexico and Japan seemed to be the only other two nations receiving rather significant amounts of paper and paper articles in 1996. Much of this would remain true over the next ten years.

By 2006, paper exports from the United States decreased or showed very little gains to most countries in the top twenty (see figure 15). In fact, had it not been for the increased exports to Canada and Mexico, U.S. based paper exports would have showed a significant decline over the decade. The top five destinations remained very much the same with the exception of China replacing Hong Kong in the number four position. Exports to Hong Kong decreased nearly 70% moving them down to fifteenth, while exports to China increased almost 85%. Although Japan and the United Kingdom remained in third and fifth respectively, exports to both countries dropped off. With the exception of a handful of countries, this was the case for U.S. paper exports. Other than Canada, Mexico, and China, the vast majority of gains in exports were witnessed in Latin American nations such as Costa Rica, the Dominican Republic, Ecuador, Guatemala, and Columbia.

Figure 14. Top 5 destination countries for U.S. paper exports in 1996

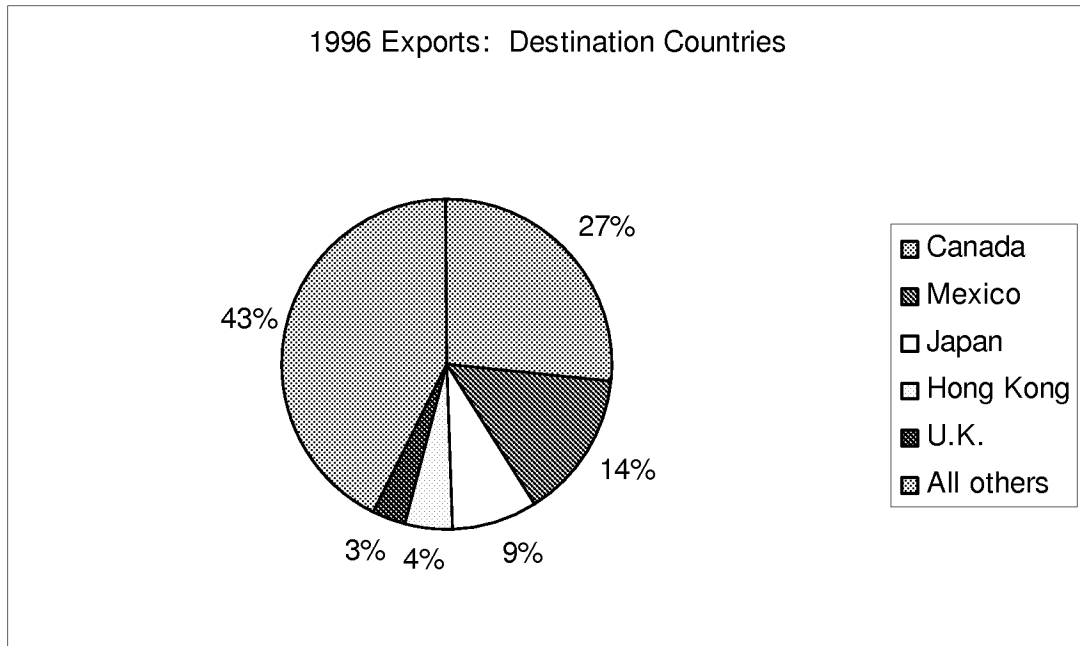
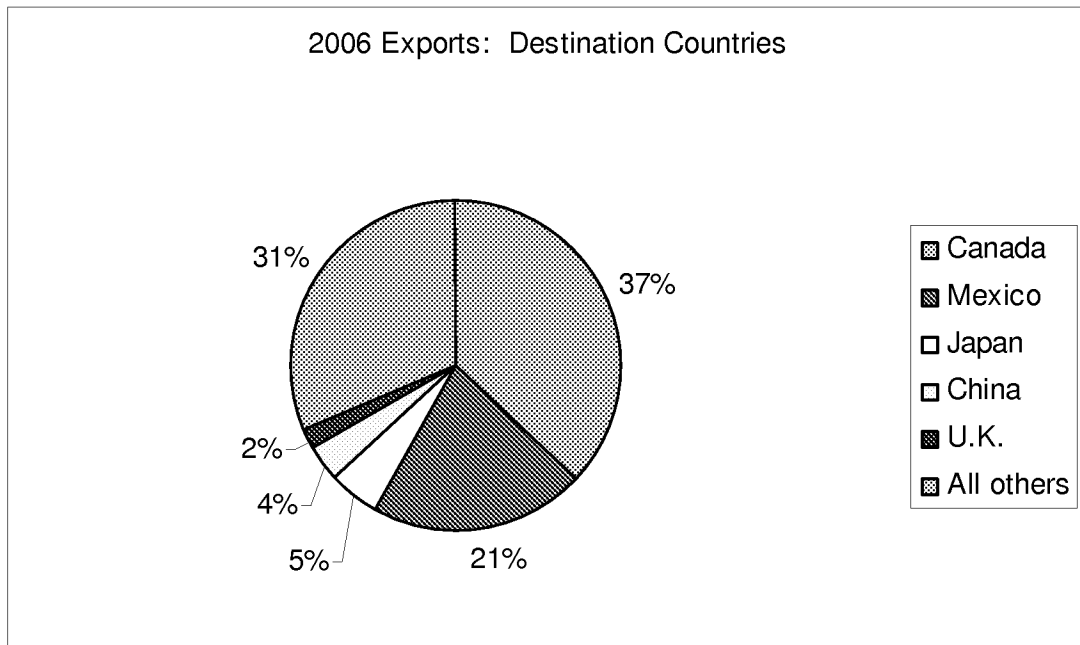


Figure 15. Top 5 destination countries for U.S. paper exports in 2006



In the process of combining all this information, several key changes and patterns emerge. First, paper imports seem to be on the rise, while exports, for the most part, appear to be on a decline. Canada's dominance in both the imports and exports seems unwavering. However, as witnessed elsewhere, China has once again emerged as a major player and may one day overtake Canada as the largest trading partner in forest products with the United States. Although many paper imports originate in Europe, significant gains were witnessed from countries located elsewhere. Had it not been for the markets of Canada and Mexico, paper exports would have showed a considerable decline. Although paper exports to most other countries appear to be on decline, exports destined for many Latin American nations seem to be on the rise. However, gains witnessed from these Latin American countries alone will not negate the losses evidenced in so many other countries.

Table 3. Aggregate paper import and export data for 1996 and 2006

Paper Imports

	1996 Imports		2006 Imports
Canada	8488543855	Canada	10437658880
Finland	574018715	China	1865046211
Germany	353419990	Finland	1107385366
Mexico	304682943	Germany	891087785
United Kingdom	281565311	Mexico	858579245
Japan	281514341	Japan	541138864
China	269715985	Korea	470434185
France	192298650	Brazil	254195452
Norway	140345305	France	238131386
Netherlands	113684202	Sweden	227993588
Sweden	106348046	United Kingdom	225705612
Italy	86895630	Indonesia	221552730
Korea	66580878	Italy	201615407
Austria	65637461	Norway	146982518
Brazil	56448559	Austria	132648875

Taiwan	46656907
Belgium	43819712
Switzerland	40611985
Indonesia	39259865
Spain	35255767
Subtotal	11587304107
All others	178879599
Total	11766183706

Netherlands	111973583
Portugal	88418470
Spain	85412234
Taiwan	80199803
Hong Kong	73519990
Subtotal	18259680184
All others	531568296
Total	18791248480

Paper Exports

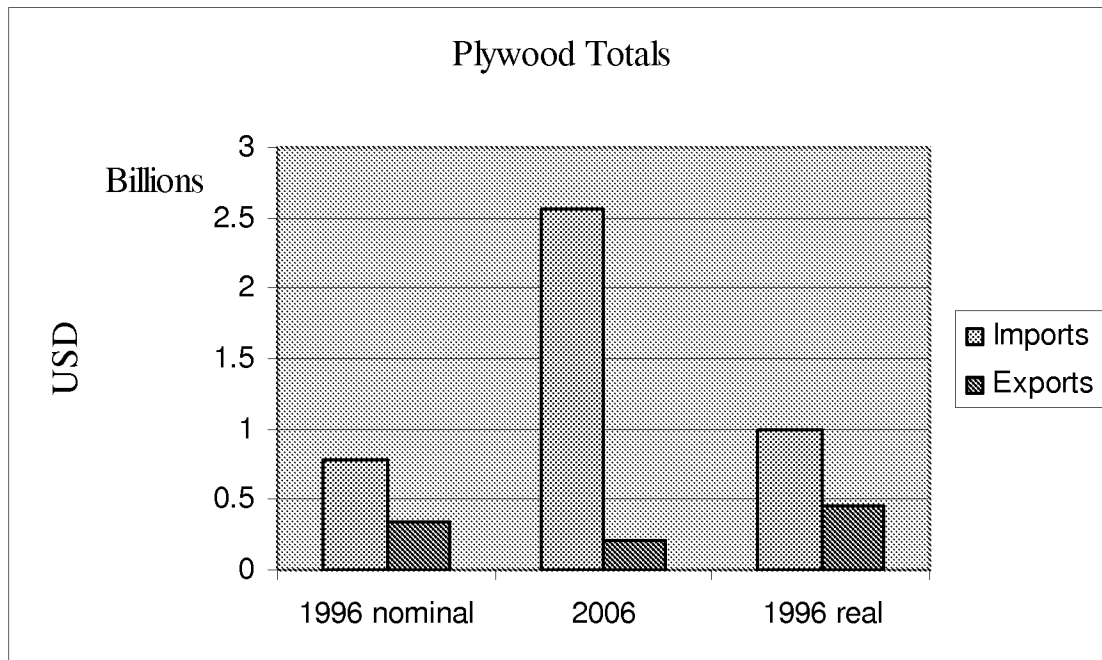
	1996 Exports
Canada	2685980033
Mexico	1449969705
Japan	856510564
Hong Kong	445308960
United Kingdom	319039557
China	249568508
Korea	247198852
Netherlands	241022374
Brazil	235528212
Australia	225096054
Taiwan	213800661
Germany	203668555
Ecuador	141492707
Costa Rica	129727997
Italy	129031179
Singapore	124591988
Malaysia	118919244
France	116728900
Belgium	107339569
Chile	100980723
Subtotal	8341504342
All others	1732759208
Total	10074263550

	2006 Exports
Canada	4750276571
Mexico	2719922806
Japan	619063926
China	460644097
United Kingdom	264163376
Australia	207904542
Costa Rica	203536973
Netherlands	194990137
Korea	188232696
Germany	176462602
Dominican Republic	158198886
Ecuador	151868317
Italy	150077076
Taiwan	147754075
Hong Kong	140170524
Guatemala	137528728
Colombia	135030371
France	126053502
Belgium	121349541
Brazil	113752980
Subtotal	11166981726
All others	1672803861
Total	12839785587

Plywood:

The trend of increasing imports and decreasing exports of forest products in the United States is noticeably evident when looking at the trade of plywood (see figure 16). The rising trade deficit is astonishing in both real and nominal terms. Although the United States was already a net importer of plywood in 1996, the deficit was not so astounding. Not only did plywood imports dramatically increase over the ten year period, but the exports also fell off. In nominal terms, imports rose nearly 230% while exports dropped off approximately 40%. In real terms, imports still increased by roughly 157%, and exports fell over 50%. In 1996, U.S. plywood exports were equal to almost one half the value of plywood imports. However, by 2006, exports did not even equal a tenth the value of the imports! This resulted in a 450% rise in the trade deficit to approximately \$2.4 billion.

Figure 16. Total value of U.S. plywood imports and exports in USD for 1996 and 2006



Plywood imports were not so overwhelmingly dominated by one country, such as Canada, as witnessed in many other product categories. Instead, a diverse mix of countries accounted for the majority of plywood imported into the United States in 1996 (see figure 17). Indonesia, which accounted for 42% of the total plywood imports, was clearly the largest single supplier of plywood to the U.S. in 1996. They were followed by Malaysia, Canada, Brazil, and Russia in the top five. For once, Canada was not the dominant force. The remaining countries in the top twenty were made-up of a host of nations from across the globe. However, their individual contributions to the total plywood imports were, for the most part, marginal at best.

By 2006, Indonesia and Malaysia had fallen off as the dominant suppliers of plywood to the United States. However, their slack was picked up by several other countries (see figure 18). China once again emerged as a major player to claim the dominant position as the United States' largest single supplier of plywood. In fact they moved all the way up from twelfth position. Even more astonishing was the amount by which their plywood exports to the U.S. increased. Over ten years, Chinese plywood imports increased from just over \$4 million to almost \$1 billion! Canada, Brazil, Malaysia, and Indonesia took-up the remaining top five positions. Like China, Canada and Brazil also showed substantial gains in the value of plywood exported to the United States. Canada more than quadrupled its plywood exports to the U.S. while Brazil came close to quadrupling theirs. Two other countries not in the top five that witnessed sizeable gains were Russia and Chile. Imports from Russia increased roughly 225% holding them steady as the sixth largest exporter of plywood to the U.S. Chile climbed from outside the top twenty up to seventh and accounted for nearly \$100 million worth of plywood imports. Although the value of plywood imports from Malaysia did in fact increase, the gains were far too small to reside as the number two supplier of plywood to the U.S. Instead, the country dropped down to the number four position. Even though Indonesia remained in the top five, plywood imports originating there decreased nearly 40%. As in 1996, the remaining countries in the top twenty consisted of a wide variety of countries. However, imports from these countries were small in comparison to the countries aforementioned.

Figure 17. Top 5 countries of origin for U.S. plywood imports in 1996

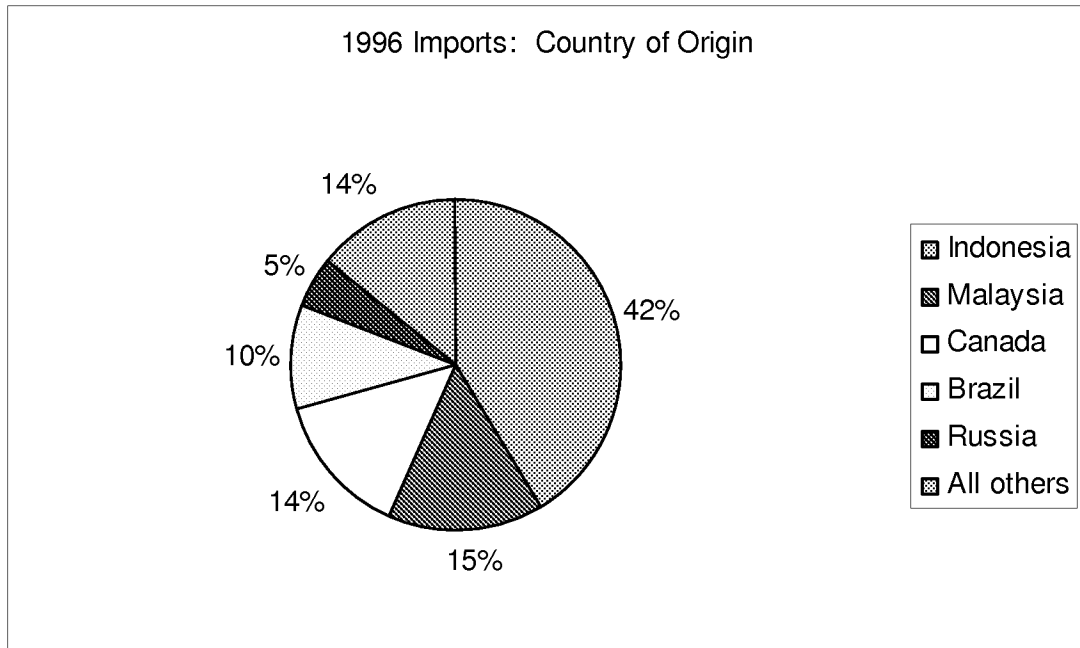
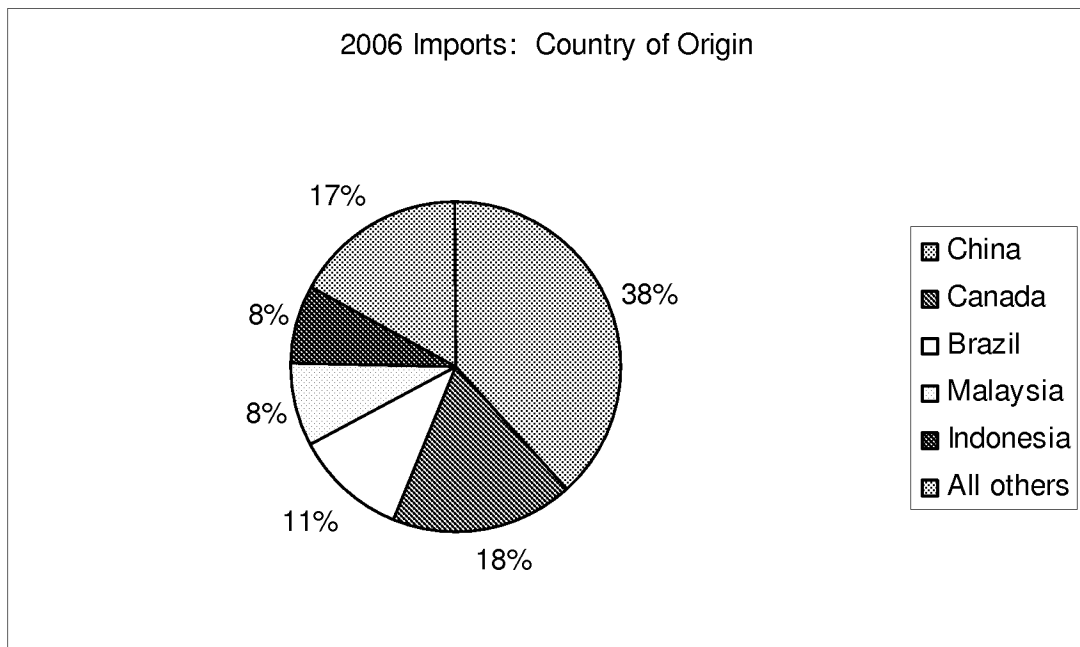


Figure 18. Top 5 countries of origin for U.S. plywood imports in 2006



The top five destinations for U.S. based plywood exports in 1996 were made-up of Canada, the United Kingdom, Germany, Mexico, and the Netherlands (see figure 19). Although small in comparison to many other categories, Canada served as the destination for 22% of the plywood exported from the United States. The top five destinations alone accounted for 83% of all plywood exports, and were by far the most significant contributors to the overall total. Outside the top five, yet still in the top twenty were a diverse mix of countries. For the first time, several Caribbean nations appear as key destinations for U.S. based forest products exports.

As stated earlier, there was a considerable decline in plywood exports from the United States between 1996 and 2006 (see figure 20). However, exports did not drop-off to all destinations. Plywood exports to Canada rose approximately 30% in nominal terms leaving Canada as the premier destination for U.S. based plywood exports. Furthermore, Canada accounted for 47% of all plywood exports originating in the United States. Other than Canada, Mexico seemed to be the only other seemingly sizeable contributor to the United States' plywood export market. Exports to Mexico also increased moving the nation to second position and making-up 24% of the plywood exports in 2006. The Bahamas, China, and the Dominican Republic rounded out the top five all moving up in position from 1996. Although the Bahamas and China showed gains in their trade, exports to the Dominican Republic actually fell. Amazingly, due to the sharp decline in U.S. plywood exports, the Dominican Republic actually moved up from ninth to fifth. In addition, virtually all non-Caribbean nations listed in the top twenty in 1996 were replaced in 2006 by countries located in the Caribbean. However, instead of this being

attributed to a rise in exports to the Caribbean nations, a decrease in exports to the other nations is the main culprit.

Figure 19. Top 5 destination countries for U.S. plywood exports in 1996

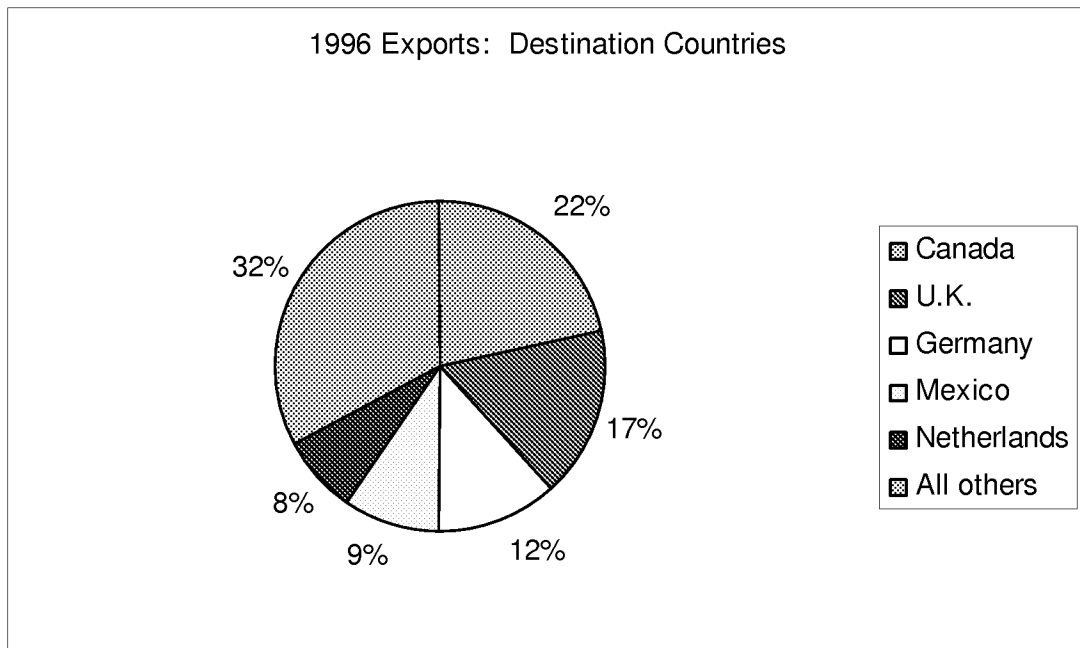


Figure 20. Top 5 destination countries for U.S. plywood exports in 2006



It is blatantly obvious when looking at the trade of plywood that many of the United States' forest products exports are on the decline while imports are on the rise. On the import side of the plywood trade, China once again emerged as a major player and exerted its control over the market. A noteworthy influx of imports was also witnessed from Canada, Brazil, Russia, and Chile. On the other hand, dropping out of the two leading positions were Indonesia and Malaysia. Another common trend emerged on the export side of the market. Exports increased to both Canada and Mexico totaling over 70% of all plywood exports leaving the United States by 2006. Furthermore, in addition to a decline in exports to most all of the countries listed in the top twenty in 1996 is the fact that they were replaced by predominately Caribbean nations by 2006. With a few exceptions, primarily Canada and Mexico, most all plywood exported from the U.S. is now destined to the Caribbean.

Table 4. Aggregate plywood import and export data for 1996 and 2006

Plywood Imports

	1996 Imports		2006 Imports
Indonesia	322431298	China	980703829
Malaysia	117091817	Canada	460009000
Canada	109476316	Brazil	278068299
Brazil	79733138	Malaysia	213047857
Russia	39481526	Indonesia	201138674
Guyana	23791775	Russia	128348279
Mexico	15300830	Chile	96613038
Taiwan	13393860	Finland	30416911
Ecuador	13058948	Taiwan	22740484
Paraguay	11639241	Ecuador	22325918
Finland	10761547	New Zealand	16948187
China	4154453	Thailand	16402661
Italy	2799396	Germany	13389674
Colombia	1871835	Spain	9002763
Sweden	1688387	Sweden	8169216

Singapore	1629387	Italy	7037186
Poland	1394088	Australia	5517466
Estonia	1123156	Guatemala	5515643
Peru	935467	France	4867718
Costa Rica	814338	Poland	4495715
Subtotal	772570803	Subtotal	2524758518
All others	5983469	All others	42595654
Total	778554272	Total	2567354172

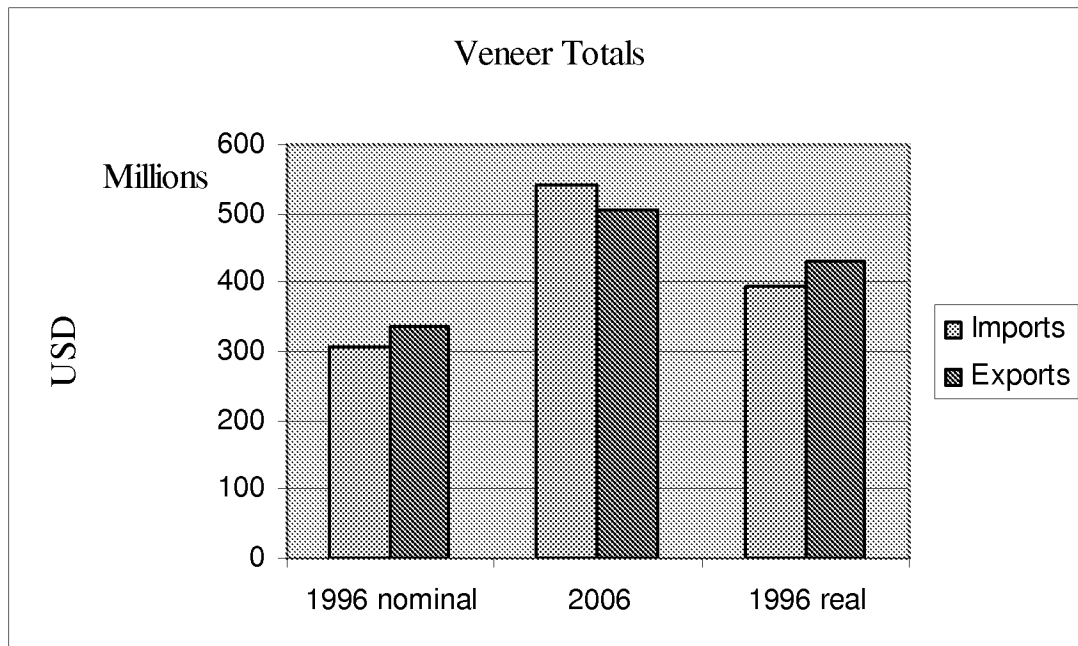
Plywood Exports:

	1996 Exports		2006 Exports
Canada	75968645	Canada	99046860
United Kingdom	58131445	Mexico	51278833
Germany	40893513	Bahamas	9974629
Mexico	33214925	China	6069097
		Dominican Republic	5358737
Netherlands	26608147	Guadeloupe	3549982
Belgium	15713429	Barbados	2689511
Japan	12716750	Grenada Is	2621924
Ireland	6666090		
Dominican Republic	5919876	Cayman Is	2398343
Denmark	5560772	St. Lucia Is	2190569
Italy	5340472	Turks & Caic Is	1971965
Trin & Tobago	5072554	Antigua Barbuda	1820845
Jamaica	4849045	Jamaica	1569376
Bahamas	4791931	Trin & Tobago	1568623
Netherlands Ant	4198657	Hong Kong	1552929
Guadeloupe	4119071	Netherlands	1002303
Antigua Barbuda	2611912	Bermuda	940241
Sweden	2566478	St Vinc & Gren	933371
Israel	2455469	Netherlands Ant	913005
France	2350822	Vietnam	788328
Subtotal	319750003	Subtotal	198239471
All others	30700256	All others	11526616
Total	350450259	Total	209766087

Veneer:

The trend of the United States becoming a net importer of forest products coupled with another trade deficit appears yet again with veneer (see figure 21). While the values of veneer imports and exports were very close in 1996, the United States was a net exporter of this forest product. However, due to the rising imports coupled with the inability of the exports to keep up, the U.S. witnessed a trade deficit in veneer by the year 2006. Imports and exports rose over the ten year period in both real and nominal terms. In nominal terms, imports showed a 77% gain while exports rose only 51%. In real terms, the gains were 38% and 18% respectively. Over the decade, the United States went from having a trade surplus of approximately \$29 million to having a trade deficit valued over \$36 million.

Figure 21. Total value of U.S. veneer imports and exports in USD for 1996 and 2006



In 1996, Canada made-up the vast majority of veneer imported into the United States (see figure 22). They were the leading exporter of veneer to the United States and accounted for 65% of all veneer imported into the country. Brazil was a distant second with 12% of the total veneer imports. Following Brazil were Italy, Germany, and Cote d'Ivoire. Imports from most other countries in the top twenty were very small in comparison to the countries just mentioned.

Canada remained the leading exporter of veneer to the United States over the ten year period (see figure 23). By 2006, veneer imports from Canada increased nearly 86% and made-up 69% of all veneer imports. Brazil also remained in the number two position but actually showed a slight decrease in the value of veneer exported to the U.S. from \$36 million in 1996 to just over \$34 million in 2006. Imports from Germany nearly doubled moving them into third while Italy fell to fourth even after gains of 129%. China once

again emerged out of nowhere to round-out the top five. Imports from China increased more than \$20 million to move them up from the eighteenth slot. Outside of the top five, one country in particular showed impressive gains. Ghana increased its veneer exports to the United States more than \$13 million, or nearly 330%, to slide into sixth. Following Ghana, imports from other countries fall off dramatically and are seemingly insignificant when compared in the overall picture.

Figure 22. Top 5 countries of origin for U.S. veneer imports in 1996

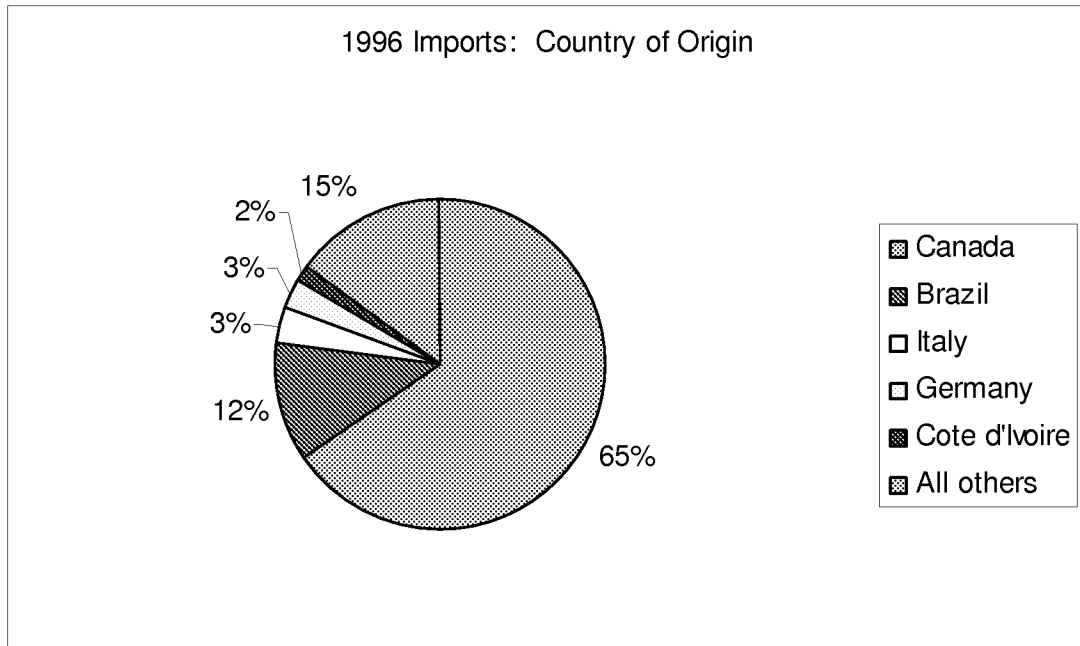
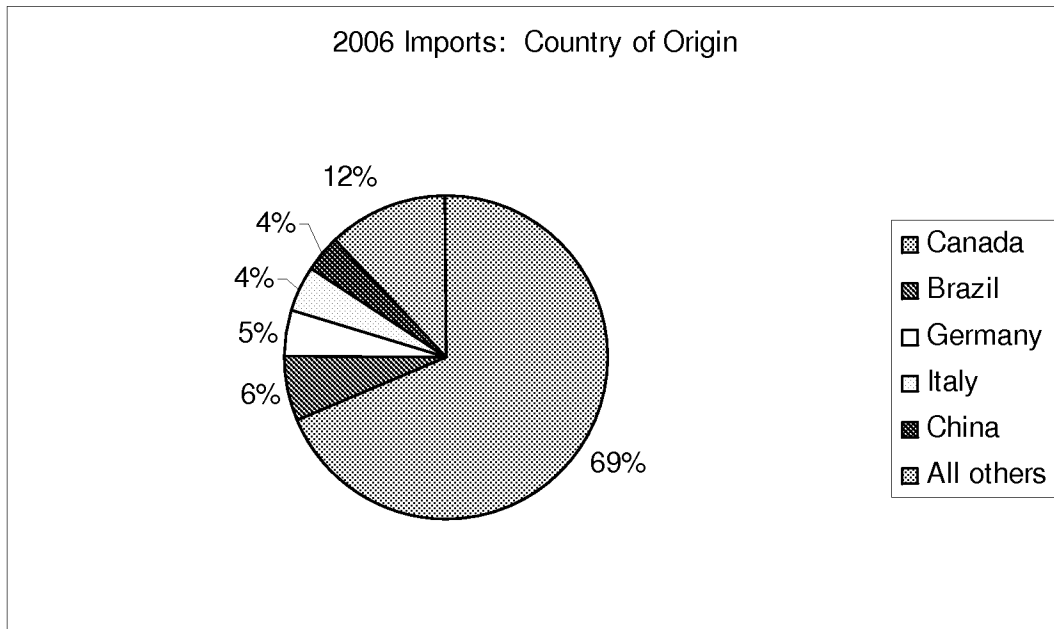


Figure 23. Top 5 countries of origin for U.S. veneer imports in 2006



Germany served as the primary destination of veneer exported from the United States in 1996 and accounted for 26% of the total exports (see figure 24). Canada was not far behind with 19% of all veneer exported from the U.S. Spain, the United Kingdom, and Japan all imported very similar amounts of veneer from the U.S. and rounded-out the top five. Numerous other Asian and European nations were found in the top twenty. However, following Belgium and Italy in the sixth and seventh positions, export values seemed to drop off rather significantly.

By 2006, Canada had replaced Germany as the premier destination of veneer exported from the U.S. In fact, had it not been for the substantial increase in veneer exports to Canada, export gains would have been greatly reduced and the trade deficit would be much larger (see figure 25). Exports to Canada increased more than \$100 million and drove Canada's share of U.S. based veneer exports up to 32%. Germany swapped places with Canada between 1996 and 2006 and actually imported roughly \$7 million less in 2006 than in 1996. Spain, China, and Italy followed Germany in the top five and all showed impressive gains. Exports to both Spain and Italy more than doubled while exports to China overwhelmingly increased moving them from outside the top twenty in 1996 to the fourth position in 2006. This trend with China mimics those witnessed in many other forest products categories. A couple other similar trends that stand out when looking at veneer exports are those of decreasing exports to Japan and increasing exports to Mexico. Exports to Japan dropped off so significantly that Japan fell from being the fifth largest destination of U.S. based veneer exports out of the top twenty all together. On the other hand, veneer exports to Mexico nearly tripled moving the country into sixth position by 2006. Imports to other countries in the top twenty

seemed to fall off rather significantly following Mexico. And, as in 1996, numerous European and Asian nations helped make-up the top twenty destinations for veneer exports.

Figure 24. Top 5 destination countries for U.S. veneer exports in 1996

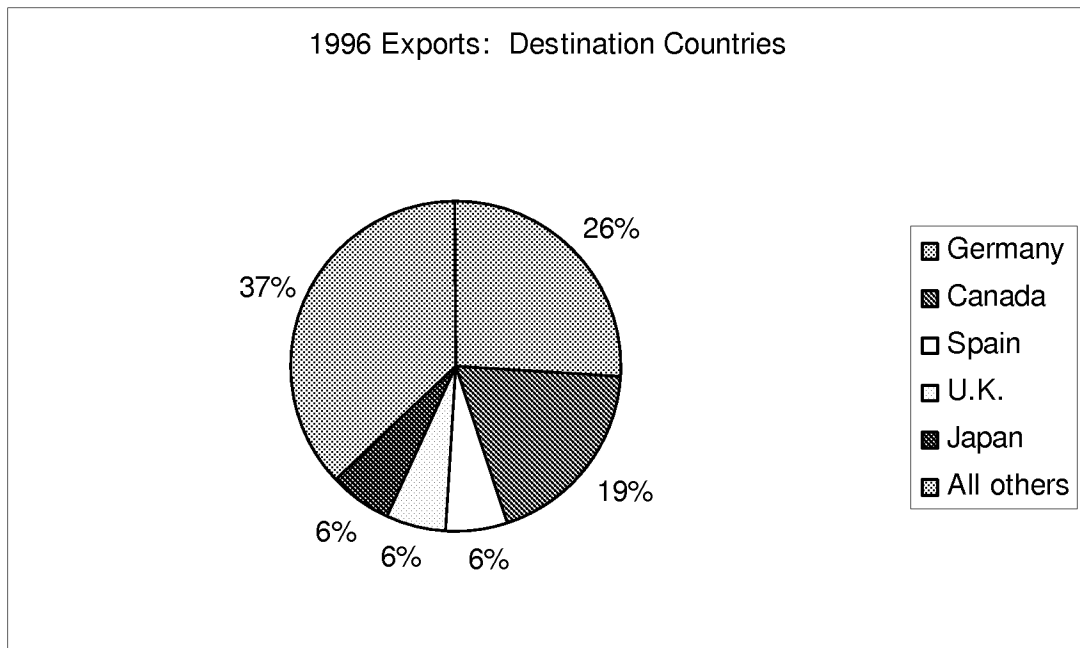
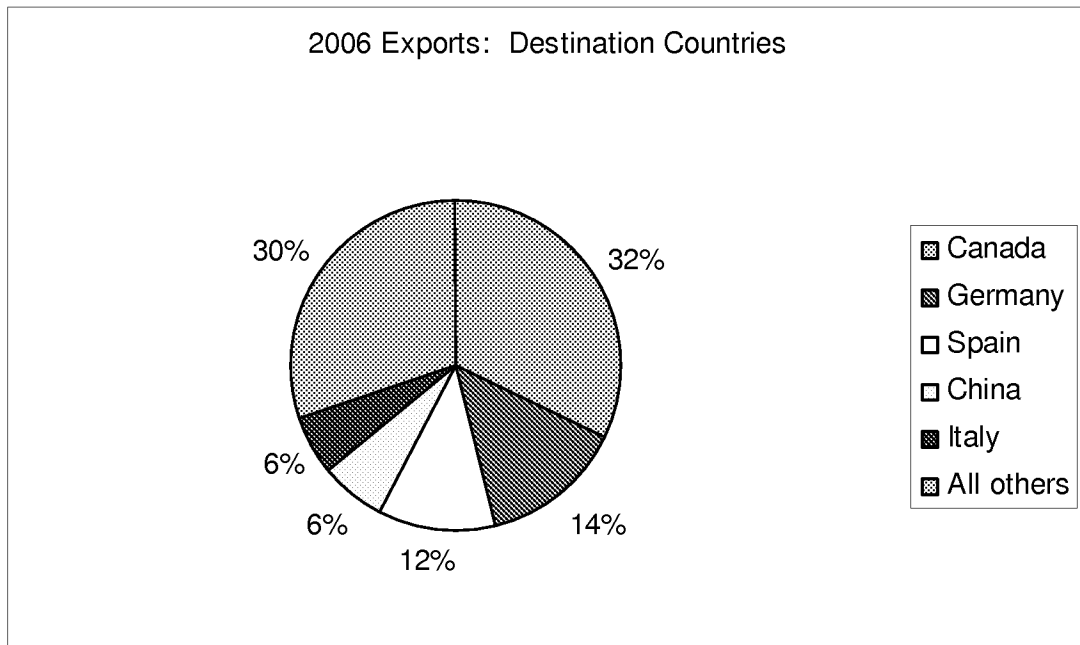


Figure 25. Top 5 destination countries for U.S. veneer exports in 2006



In review, a shift was witnessed in the trade of veneer in the form of the United States transitioning from a net exporter of veneer to that of a net importer. Had it not been for the large influx of exports to Canada, the trade deficit would be much worse. In addition to the gains in exports to Canada, increases in veneer imports from Canada were even greater leaving the country as both the dominant importer and exporter of veneer with the United States. Numerous other recurring trends were witnessed as well. China's emergence was prevalent in both the import and export market. Brazil once again stood out as a major exporter of forest products to the United States. Japan continues to fall off as primary destination for U.S. forest products exports. Finally, Mexico seems to be following behind Canada as forest products exported from the United States to Mexico are on the rise.

Table 5. Aggregate veneer import and export data for 1996 and 2006

Veneer Imports:

	1996 Imports		2006 Imports
Canada	200444625	Canada	372585834
Brazil	35937177	Brazil	34229312
Italy	10623552	Germany	25625474
Germany	9063552	Italy	24328952
Cote d'Ivoire	5019944	China	20640422
Congo (ROC)	4437666	Ghana	17265393
Paraguay	4230419	Cote d'Ivoire	5454033
Ghana	4028674	France	5161390
Mexico	3149222	Spain	4986568
United Kingdom	2803495	Mexico	3869019
France	2655305	Japan	2960741
Fiji	2530702	India	2478877
Chile	2448683	Netherlands	2016307
Malaysia	2304180	Finland	2009402
Japan	2183412	United Kingdom	1518596
Belgium	2096493	Ecuador	1318502
Spain	1742475	Cameroon	1227305
China	1624572	Gabon	1091418

India	1097844	Switzerland	1086240
Thailand	957342	Czech Republic	1052109
Subtotal	299379695	Subtotal	530905889
All others	7538692	All others	11968030
Total	306918387	Total	542873919

Veneer Exports:

	1996 Exports		2006 Exports
Germany	87718585	Canada	163659547
Canada	62855055	Germany	69519448
Spain	20026107	Spain	58927273
United Kingdom	19827647	China	31725738
Japan	19756711	Italy	30054742
Belgium	14790131	Mexico	25341437
Italy	13186625	Hong Kong	12345327
Mexico	9784182	Taiwan	12157214
Hong Kong	9435384	Belgium	11432045
Korea	9215446	Egypt	9839812
Taiwan	8896693	United Kingdom	7514097
Malaysia	8742359	Portugal	6559823
South Africa	5101185	Indonesia	5963941
Greece	4041999	Malaysia	5429344
Indonesia	3065736	Vietnam	4730560
Denmark	2971372	South Africa	4581901
Egypt	2969361	Greece	4429132
Sweden	2690212	Denmark	3237742
Singapore	2486729	Korea	3093543
France	2423016	Netherlands	2504970
Subtotal	309984485	Subtotal	473047636
All others	25549205	All others	33658337
Total	335533690	Total	506705973

DISCUSSION

After dissecting the trade data on the various forest products categories, numerous trends and changing patterns of trade emerge involving the global trade of forest products with the United States. These changing patterns of trade will have very real ramifications for not only the forest products industry in the United States, but also those associated with it. By revealing many of these new and emerging trade patterns, some insight will be gained as to the future role of the United States in global forest products.

Furthermore, although this research has focused primarily on identifying the recent changes in the market, there are numerous factors driving the change.

As witnessed in four out of the five categories covered in this study, the trade deficit in forest products is for the most part, on the rise in the United States. Even with a healthy forest industry, United States' imports are increasing across the board. The issue of concern for the United States is its ability to competitively manufacture (Winistorfer 2005). It is difficult to compete in today's global market with other countries that can produce the same commodity quicker and/or cheaper. This is why Winistorfer (2005) suggests the prevailing domestic thought is that American producers must move up the value-chain if they are to sustain the manufacturing base and economic output from the sector. Although a trade deficit was already present in 1996 for lumber, paper, and plywood, the margin increased over the ten year time-frame covered in this study. In some cases, the amount by which the trade deficit rose was extraordinary. In addition,

the U.S. went from being a net exporter of veneer in 1996 to a net importer by 2006. On the other hand, pulp was the only product category that did not share this common trend. Thanks in large part to increased shipments to China, the trade of pulp in the United States experienced a rise in the trade surplus.

Two countries that consistently stand out when looking at the trade of forest products with the U.S. are Canada and Mexico. Not surprisingly, these are the two countries coupled with the United States in the North American Free Trade Agreement (NAFTA). However, due to the fact that extensive trade in forest products with these nations dates back long before the creation of NAFTA, it is difficult at best to pinpoint exactly how much trade can be attributed to the trade agreement. Regardless, Canada continually appeared as the dominant trading partner with the United States in many of the categories, especially involving U.S. imports. Canada is by far the largest single trading partner with the U.S. in forest products. Mexico also made routine appearances as one of the leading trading partners with the U.S. in the various categories. However, there was a common theme that emerged.

Exports to both Canada and Mexico seem to be increasing much more than imports from the two countries (see figures 26 and 27). Furthermore, Canada's dominance appears to be weakening over much of the import market. The percentage of lumber, pulp, and paper imported from Canada as opposed to other countries showed a significant decline from 1996 to 2006. The same was true for Mexico in every category but paper and paper articles. However, while U.S. forest products exports are experiencing an overall decline with respect to most countries, exports to Canada and Mexico are on the rise. Exports to Canada and Mexico increased in every single category

over the ten year period. In many cases, the increase in exports to these countries helped prevent an even larger rise in the trade deficit.

Another noteworthy trend that emerged when looking at the recent history in the trade of forest products involved Japan. Between 1996 and 2006, Japan showed a significant decline as one of the United States single largest destinations for forest products exports. In 1996, Japan was among the top five destinations for U.S. exports in every category but plywood, where it was seventh. Moreover, it served as the largest destination for both pulp and lumber. Over the 1996-2006 period, exports to Japan declined in every single category. By 2006, Japan appeared as a top five export destination only in pulp and paper and was not even listed among the top twenty in plywood and veneer.

There are most likely numerous explanations for Japan's fall, some of which may include several economic recessions and the hasty growth of China. Japan's economy rapidly faltered in the 1990s which was very likely a significant contributor to Japan's decline as a premier destination for U.S. forest products exports. In addition, China's rapid economic expansion and growth in the forest products industry coupled with their close proximity to Japan may have very likely further crippled Japan's trade in forest products with the United States. Surprisingly, the value of the yen relative to the US dollar does not seem to be a likely cause for the decline in trade with Japan. Although there was some fluctuation in the value of the yen between 1996 and 2006, the value of the yen relative to the dollar in 1996 and in 2006 was very similar. However, the yen did have a slightly higher value in 1996 than 2006.

In contrast to Japan, trade with several Latin American nations expanded over the decade under consideration, especially trade involving forest products imported into the United States. This may come as no surprise considering the vast forest resources and favorable growing climates found in much of Latin America. In addition, exchange rates between the U.S. and Latin American nations became more favorable for the United States between 1996 and 2006 increasing the United States' purchasing power of Latin American forest products. Brazil and Chile stand out among the Latin American nations as the largest trading partners of forest products with the United States. Brazil is by far the most dominant, appearing as one of the top five leading exporters of forest products to the United States in four out of the five categories covered in this research. Additionally, imports from Brazil increased in four out of the five categories. Overall, Latin America continues to be a leading source of forest products imported into the U.S.

Like Latin America, imports from Europe also showed significant gains in many cases. Imports from a number of European countries rose in all five product categories. Several countries that specifically stand out among European nations as leading exporters of forest products to the U.S. are Germany, Finland, Sweden, and Italy. At least two of these countries were among the top five exporters in 2006 in every category other than plywood. Similar to the overall trend of U.S. forest products, exports to Europe are, for the most part, in a decline. One case in particular involves the United Kingdom. Much like Japan, the U.K. served as a key destination for U.S. exports and ranked among the top seven in all five categories in 1996. However, by 2006, exports destined for the United Kingdom declined significantly and took with it a large portion of the United States export market. As exports to the U.K. and other countries in the region continue to

fall and imports continue to rise, Europe will remain a leading supplier of forest products to the United States.

Likely the most significant change seen over the ten years was the emergence and in some cases dominance of China in the trade of forest products with the U.S. Substantial increases in the value of forest products imported into the United States from China were seen in all five categories. In fact, China now dominates the plywood imports and is closing in on Canada in the paper market. Not only has China become a major source of U.S. imports, they have also provided a much needed destination for U.S. exports. In addition to Canada and Mexico, China played a huge role in salvaging much of the U.S. export market. Like Chinese imports, exports destined for China also increased in all five categories. By 2006, China was among the top five destinations for U.S. exports in all five categories and was by far the largest single destination for pulp products. If the trend continues, China could quite possibly overtake Canada as the largest single trading partner in forest products with the United States.

Although the objective of this study was not to determine the factors driving the many changes taking place in the market, there are several obvious factors that have most certainly played a key role. Globalization, trade agreements, exchange rates, foreign investment, economic growth and recessions are among the plausible factors that have contributed to much of the change depicted in this study. Trade agreements, such as NAFTA, stimulate global trade through the reduction of trade barriers and contribute to globalization. Although the exact contribution of NAFTA is difficult to pinpoint, it has very likely had an impact on the trade of forest products with Canada and Mexico. Exchange rates, in one way or another, have played a role in the trade with all the

countries mentioned here. According to Bolkesjo et al. (2006) and Babula et al. (1995), exchange rates affect a country's competitiveness in global markets. For example, the large influx in imports received from Brazil may very likely piggyback the value of the USD more than doubling in value to the Brazilian Real between 1996 and 2006. A great deal of foreign investment in the forest products industry has taken place in South America. This may provide some reasoning behind many of the trends witnessed with the Latin American nations along with an example of how foreign investment could be one of the driving factors behind the change. Finally, significant economic growth such as that taking place in China or economic recessions such as those experienced in Japan may provide evidence of how these factors drive change in the global forest products market. Additional research into the reasons behind the change could prove beneficial in providing more valuable information as to the future role of the United States in the global forest products market.

Figure 26. Combined imports for all five categories – Top 10 countries of origin (Note Canada is graphed separately due to differences in scaling)

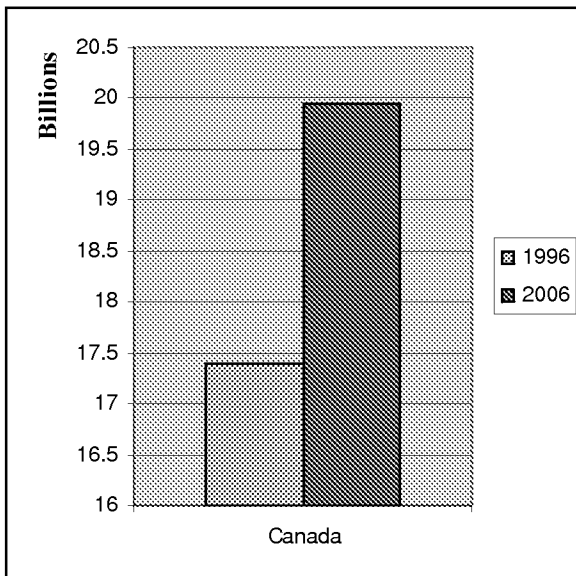
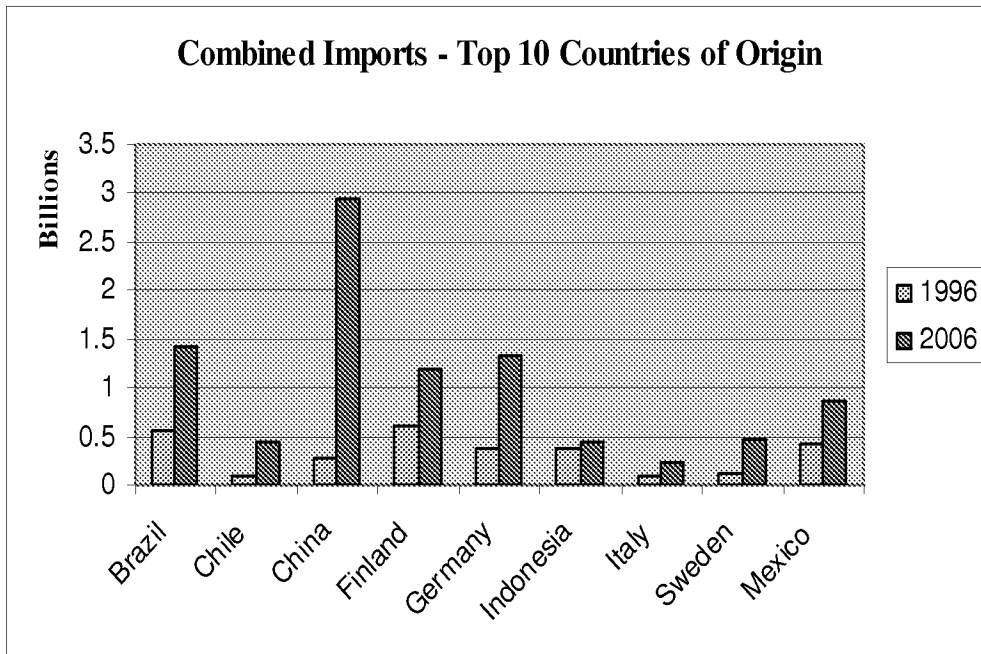
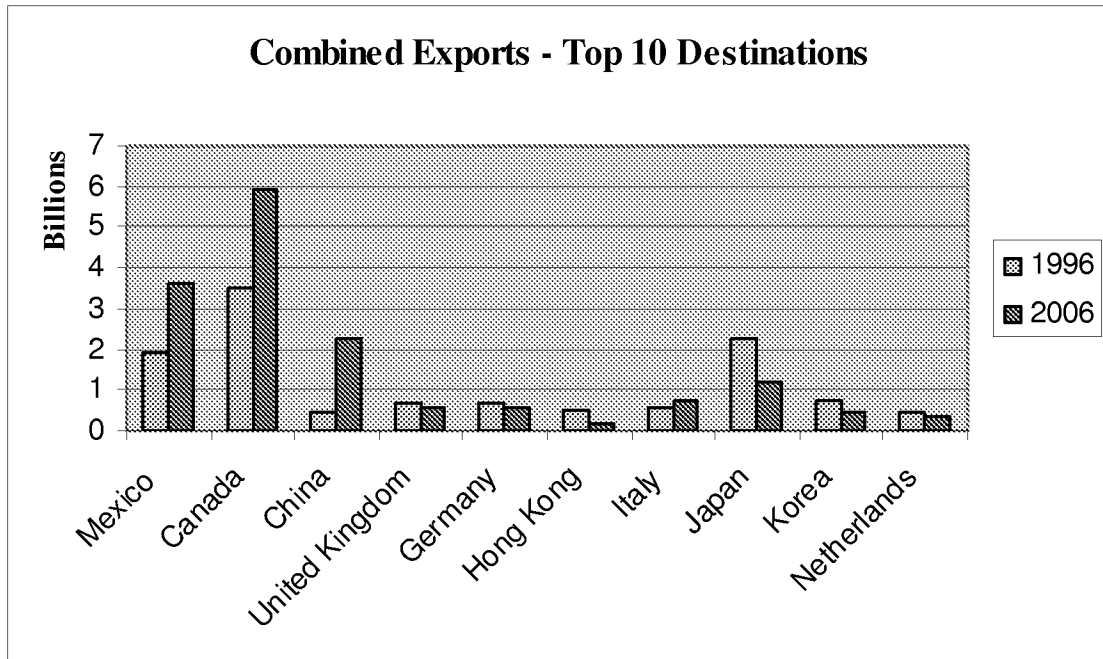


Figure 27. Combined exports for all five categories – Top 10 destination countries



REFERENCES

- Adams, J. 2005 October. Forest products hold steady at port: effects of Hurricane Katrina on market still being determined. *Alabama Seaport*: 4-7
- Arda, M. 2004. A general picture of the world commodity economy. *Unasylva*, 55: 11-18.
- Babula, R.A., F.J. Ruppel, and D.A. Bessler. 1995. US Corn exports: the role of the exchange rate. *Agricultural Economics*, 13, 75-88.
- Bolkesjo, T.F. and J. Buongiorno. 2006. Short and long-run exchange rate effects on forest product trade: evidence from panel data. *Journal of Forest Economics*, 11: 205-221.
- Bowyer, J.L. 2004. Changing realities in forest sector markets. *Unasylva*, 55: 59-64.
- Conditions of Competition in U.S. Forest Products Trade* (Inv. No. 332-400, USITC Publication 3246, October 1999)
- Ferrill, P. 2006. Report identifies pulp mills most at risk in south USA. *IFPTA Journal*, 23 (3): 11.
- Freese, R. 1998. Fiscal 1999 outlook for U.S. forest products trade: U.S. solid wood exports to decline slightly; imports may increase further. *FAS Forest Products News Reports*. Dec. 1998. (<http://www.fas.usda.gov/ffpd/wood-circulars/dec98/news.pdf>)
- Gan, J. and S. Ganguli. 2003. Effects of global trade liberalization on U.S. forest products industries and trade: a computable general equilibrium analysis. *Forest Products Journal*, 53 (4): 29-35.
- Haas, M. P. and P.M. Smith. 1997. Global markets for U.S. hardwood components. *Forest Products Journal*, 47 (3): 45-51.
- Hammett, A. L. III and C.E. DeForest. 1993. Southern hardwood lumber exporters: practices and problems. *Forest Products Journal* 43 (3): 9-14.
- Hashiramoto, O., J. Castano, and S. Johnson. 2004. Changing global picture of trade in wood products. *Unasylva*, 55: 19-26.

- Holland, I.I. 1962. Foreign trade in forest products from the point of view of an importing country: the United States. *Journal of Forestry*, 60 (8): 538-545.
- Luppold, W.G. 1994. The U.S. hardwood log export situation: what is the problem? *Forest Products Journal*, 44 (9): 63-67.
- Meyer, D. 2004. Impacts of imports and exports on the U.S. hardwood industry. Lake States Lumber Association meeting, Forest Products Imports/Exports-How Will It Affect Your Future? Wausau, Wisconsin, USA, 24 February.
- Peck, T. 2002. The international timber trade. *Forest Products Journal*, 52 (9): 10-19.
- Puttock, G.D., M. Sabourin, and K.D. Meilke. 1994. International trade in forest products: an overview. *Forest Products Journal*, 44 (3): 49-56.
- US International Trade Commission 2007. URL: http://www.usitc.gov/tradeshifts/2006/tradeshifts_forest.htm. Accessed May 2007.
- Winistorfer, P.M. 2005. Competitiveness, manufacturing, and the role of education in the supply chain for the forest industry. *Forest Products Journal*, 55 (6): 6-16.
- Wisdom, H.W. 1977. Expanding role for the south in world trade. *Southern Journal of Applied Forestry*, 1 (4): 11-15.