



## Implications of Liberalizing Korea-U.S. Trade in the Automobile Sector: Potential Impact of the Korea-U.S. Free Trade Agreement

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The automobile industry is a dynamic and significant sector in most of the major economies in the world. It is closely related to various other manufacturing sectors such as rubber, plastic, and chemicals; fabrics; steel; and mechanical, electric, and electronic equipment. Recently the automobile industry has been making progress toward further environmental friendliness, energy efficiency, and passenger safety with the use of information and communication technology. The automobile industry accounts for a significant share of world trade as well. In addition, the world automobile industry is experiencing structural changes, a fact that is a matter of great concern in world trade and the world's economies.

Korea's automobile industry has developed rapidly; hence, its exports have increased significantly during the past three decades or so. Its imports, however, have not grown impressively even considering the rapid growth in Korea's domestic market for automobiles. This situation has generated major trade concerns and tension between Korea and the United States. Various efforts have been made to solve the problems bilaterally.

The free trade agreement between Korea and the United States (the KORUS FTA)—negotiations were concluded in April 2007—is expected to contribute to general solutions to the auto-industry problems between the two countries because the agreement contains comprehensive trade liberalization and deregulation measures.

The purpose of this paper is to review trends and major issues in international trade in the automobile industries in Korea and the United States from the viewpoint of

bilateral trade, and then to examine their implications and the potential impact of the KORUS FTA.

### The Automobile Sector

#### World Trade in the Automobile Sector

According to the International Trade Center (UNCTAD/WTO) database, the value of automobiles and their parts (HS 87 vehicles other than railway, tramway; hereafter automobile sector)<sup>1</sup> among world exports amounted to \$999.6 billion and accounted for 8.8 percent of aggregate world merchandise trade in 2005 (*Table 1*). The United States occupied the third largest share, about 9.1 percent, of world automobile sector exports, following Germany (with 18.7 percent) and Japan (13.8 percent) in the same year (*Table 2*). Korea ranked the eighth largest, with about 4.1 percent of world automobile sector exports in 2005.

For imports, the United States ranked the first with 22.6 percent of the world's automobile sector imports, followed by Germany (7.6 percent), the United Kingdom (6.6 percent), and Canada (6.0 percent). In terms of net trade or trade balance, that is, exports less imports, Japan showed the largest value—\$111.26 billion—followed by Germany (\$102.10 billion), Korea (\$33.30 billion) and Canada (\$10.36 billion).

Net trade can be transformed into an index:  $([X-M]/[X+M]*100)$  as in *Table 1*. Among the top 20 largest exporters in the automobile sector, the net trade index is the largest in Japan (80.0) followed by Korea (79.9), Brazil (48.1), and Germany (42.8); and it is the smallest in the United States (-41.9), followed by the UK (-22.7), Italy (-18.4), and the Netherlands (-13.8).

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**Table 1: World Trade in the Automobile Sector (HS 87), 2005, in millions of dollars**

Country	Exports (X)	Imports (M)	Net trade (X-M)	Net trade index $(\frac{X-M}{X+M} * 100)$
World	999,550.9	900,021.1	9,529.8	0.5
Germany	170,403.4	68,305.0	102,098.4	42.8
Japan	125,125.8	13,865.6	111,260.2	80.0
United States	83,160.6	203,247.9	120,087.3	-41.9
Canada	64,663.6	54,302.6	10,361.1	8.7
France	59,683.2	51,955.2	7,728.0	6.9
Belgium	41,498.0	34,228.7	7,269.3	9.6
Spain	41,384.7	45,328.0	-3,943.3	-4.5
Korea	37,491.2	4,193.2	33,298.1	79.9
United Kingdom	37,316.7	59,259.6	-21,942.9	-22.7
Mexico	32,092.4	22,043.8	10,048.7	18.6
Italy	30,286.2	43,971.7	-13,685.5	-18.4
Sweden	18,006.7	12,200.7	5,806.0	19.2
China	16,594.4	12,309.1	4,285.4	14.8
Austria	13,969.30	13,879.00	90.30	0.3
Czech Republic	12,804.20	6,651.90	6,152.30	31.6
Netherlands	12,707.60	16,774.10	-4,066.50	-13.8
Poland	11,655.30	8,836.20	2,819.10	13.8
Brazil	11,531.20	4,040.90	7,490.40	48.1
Turkey	9,566.40	10,552.80	-986.40	-4.9
Thailand	8,152.30	4,035.70	4,116.50	33.8

Source: International Trade Center (UNCTAD/WTO) database, <http://www.intracen.org>. Note: HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

In sum, the automobile sector explains a significant portion of world merchandise trade. World trade in the auto-mobile sector is concentrated on a small number of countries. More specifically, the top three to five countries account for 40 to 50 percent of the world's exports and imports in the automobile sector. In addition, major players are clearly divided by whether they are export-oriented countries (Japan, Germany, and Korea) or import-oriented countries (the United States, the UK, and Italy) in terms of net trade or trade balance.

Between 2001 and 2005, Germany, Korea, the UK, Sweden, China, Austria, the Czech Republic, Poland, Brazil, Turkey, and Thailand experienced an increase in automobile exports and an increase in their net trade share in the world market (Table 2). In contrast, the United States, Canada, France, Belgium, Spain, Mexico, and Italy saw their exports and net trade share decreasing in the world automobile exports market during the same period. Over-

**Table 2: World Trade in the Automobile Sector (HS 87), Share of Countries, 2001 and 2005, percentage**

Country	Exports (X)		Imports (M)		Difference (X-M)	
	2001	2005	2001	2005	2001	2005
Germany	17.9	18.7	7.5	7.6	10.4	11.1
Japan	14.7	13.8	1.7	1.5	13.0	12.3
United States	10.6	9.1	28.8	22.6	-18.2	-13.5
Canada	9.6	7.1	6.8	6.0	2.8	1.1
France	6.8	6.6	5.5	5.8	1.3	0.8
Belgium	5.2	4.6	4.0	3.8	1.2	0.8
Spain	4.8	4.6	4.4	5.0	0.4	-0.4
Korea	2.8	4.1	0.3	0.5	2.5	3.6
United Kingdom	3.8	4.1	7.0	6.6	-3.2	-2.5
Mexico	5.0	3.5	3.0	2.4	2.0	1.1
Italy	3.6	3.3	4.8	4.9	-1.2	-1.6
Sweden	1.6	2.0	1.1	1.4	0.5	0.6
China	0.9	1.8	0.8	1.4	0.1	0.4
Austria	1.2	1.5	1.4	1.5	-0.2	0
Czech Republic	1.0	1.4	0.5	0.7	0.5	0.7
Netherlands	1.6	1.4	2.2	1.9	-0.6	-0.5
Poland	0.6	1.3	0.7	1.0	-0.1	0.3
Brazil	0.8	1.3	0.7	0.4	0.1	0.9
Turkey	0.4	1.1	0.3	1.2	0.1	-0.1
Thailand	0.5	0.9	0.4	0.4	0.1	0.5

Source: International Trade Center (UNCTAD/WTO) database, <http://www.intracen.org>. Note: HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

all, some Asian countries and eastern European countries expanded their market share at the expense of traditional major suppliers in North America and Europe, such as the United States, France, and Italy.

International trade in the automobile sector can be divided into two major subcategories: passenger cars (HS 8703), and parts and accessories for automobiles (HS 8708).<sup>2</sup> Germany, Japan, France, and Korea were significantly export oriented in both passenger cars, and parts and accessories for automobiles in 2005 (Table 3). In contrast, the United States, the UK, and the Netherlands are import oriented in both passenger cars, and parts and accessories for automobiles. Canada, Belgium, Spain, Mexico, and Sweden are export oriented in passenger cars but import oriented in parts and accessories for automobiles.

By denoting the country share of world trade in passenger cars and in parts and accessories of automobiles in 2005, we can identify major players in the world market more clearly (Table 4). A few countries explain the major portion of the world market of both passenger cars, and parts and accessories for automobiles. Countries can be

classified as export oriented or import oriented by sub-categories.

**Table 3: World Trade in Passenger Cars, and Parts and Accessories for Automobiles, 2005, in millions of dollars**

Country	Passenger cars (HS 8703)			Parts and accessories (HS 8708)		
	Exports	Imports	Net trade	Exports	Imports	Net trade
Germany	108,685.5	36,684.5	72,001.0	33,061.5	20,420.7	12,640.8
Japan	79,769.3	8,105.4	71,663.9	25,277.4	3,793.9	21,483.5
United States	31,277.2	125,602.9	-94,325.7	31,187.6	42,623.2	-11,435.6
Canada	37,200.8	20,083.5	17,117.3	13,405.3	20,233.5	-6,828.2
France	33,894.0	26,588.5	7,305.6	15,362.8	12,684.8	2,678.0
Belgium	28,939.9	19,269.1	9,670.8	6,190.0	9,264.5	-3,074.5
Spain	24,088.2	23,024.8	1,063.4	10,563.8	14,923.1	-4,359.3
Korea	27,256.1	1,370.0	25,886.1	7,719.0	2,197.1	5,521.9
United Kingdom	24,124.8	35,350.1	-11,225.3	7,634.6	13,169.2	-5,534.6
Mexico	13,404.4	7,840.2	5,564.2	9,788.2	10,612.2	-824.0
Italy	7,824.2	30,574.2	-22,750.0	12,168.9	5,611.5	6,557.4
Sweden	8,126.4	5,264.6	2,861.9	3,929.9	5,033.6	-1,103.8
Netherlands	2,756.7	8,580.9	-5,824.3	2,436.8	3,168.3	-731.5

Source: International Trade Center (UNCTAD/WTO) database, <http://www.intracen.org>. Note: HS 8703 refers to motor cars and other motor vehicles, including station wagons and racing cars, principally designed for the transport of persons; HS 8708 refers to parts and accessories of motor vehicles of headings 8701 to 8705 (for further categories, see note for Table 9).

**Table 4: World Trade in Passenger Cars, and Parts and Accessories for Automobiles, Share of Countries, 2005, percentage**

Country	Passenger cars (HS 8703)			Parts and accessories (HS 8708)		
	Share of world exports	Share of world imports	Difference	Share of world exports	Share of world imports	Difference
Germany	22.4	7.7	14.7	14.7	9.2	5.5
Japan	16.4	1.7	14.7	11.2	1.7	9.5
United States	6.4	26.2	-19.8	13.9	19.2	-5.3
Canada	7.7	4.2	3.5	6.0	9.1	-3.1
France	7.0	5.5	1.5	6.8	5.7	1.1
Belgium	6.0	4.0	2.0	2.8	4.2	-1.4
Spain	5.0	4.8	0.2	4.7	6.7	-2.0
Korea	5.6	0.3	5.3	3.4	1.0	2.4
United Kingdom	5.0	7.4	-2.4	3.4	5.9	-2.5
Mexico	2.8	1.6	1.2	4.4	4.8	-0.4
Italy	1.6	6.4	-4.8	5.4	2.5	2.9
Sweden	1.7	1.1	0.6	1.7	2.3	-0.6
Netherlands	0.6	1.8	-1.2	1.1	1.4	-0.3

Source: International Trade Center (UNCTAD/WTO) database, <http://www.intracen.org>. Note: HS 8703 refers to motor cars and other motor vehicles, including station wagons and racing cars, principally designed for the transport of persons; HS 8708 refers to parts and accessories of motor vehicles of headings 8701 to 8705 (for further categories, see note for Table 9).

### Comparative Advantage in the Automobile Sector

The comparative advantage of an individual country can be measured from its international trade performances by the revealed comparative advantage (RCA) index.<sup>3</sup> For the automobile sector as a whole, using 2005 data, Japan, Spain, Germany, Canada, Mexico, France, Sweden, and Korea showed a relatively high comparative advantage, with an RCA index ranging between 2.4 and 1.5 (*Table 5*). The United States, with an RCA index of 1.0, revealed no comparative advantage or disadvantage. Both Italy

and the Netherlands showed a comparative disadvantage, with RCA index scores at 0.9 and 0.4, respectively.

**Table 5: Exports and RCA Index in the Automobile Sector (HS 87), 2005, in millions of dollars and percentage**

Country	Exports	Percentage of world exports	RCA index
Germany	170,403.4	18.7	2.0
Japan	125,125.8	13.8	2.4
United States	83,160.6	9.1	1.0
Canada	64,663.6	7.1	2.0
France	59,683.2	6.6	1.6
Belgium	41,498.0	4.6	1.4
Spain	41,384.7	4.6	2.4
Korea	37,491.2	4.1	1.5
United Kingdom	37,316.7	4.1	1.1
Mexico	32,092.4	3.5	1.7
Italy	30,286.2	3.3	0.9
Sweden	18,006.7	2.0	1.6
Netherlands	12,707.6	1.4	0.4

Source: International Trade Center (UNCTAD/WTO) database, <http://www.intracen.org>. Notes: RCA = revealed comparative advantage. HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

The RCA index can be examined for the two major categories of the automobile sector, passenger cars, and parts and accessories for automobiles. For passenger cars, Japan, Germany, Spain, Canada, Korea, Belgium, and France showed a comparative advantage, whereas the Netherlands, Italy, and the United States showed a comparative disadvantage (*Table 6*). For parts and accessories for automobiles, Spain, Mexico, Japan, Canada, the United States, France, Germany, and Italy showed a comparative advantage, but the Netherlands, Belgium, and the UK showed a comparative disadvantage.

We can also trace the recent trend of comparative advantage for major exporters such as Germany, Japan, the United States, France, and Korea during the period 2001–2005. For the automobile sector as a whole, most of the major exporters can be observed to be further strengthening their comparative advantage, the most significant being Korea and France (*Table 7*).<sup>4</sup> For passenger cars, we can also observe further strengthening of a comparative advantage in most of the major exporters, especially Korea, France, and the United States.<sup>5</sup> Some differentiated trends can be observed in parts and accessories. Korea, Germany, and Japan experienced their RCA indexes increasing whereas the United States and France saw their RCA indexes decreasing.<sup>6</sup>

**Table 6: Exports and RCA Index for Passenger Cars, and Parts and Accessories for Automobiles, 2005, in millions of dollars and percentage**

Country	Passenger cars (HS 8703)			Parts and accessories (HS 8708)		
	Exports	Percentage of world exports	RCA index	Exports	Percentage of world exports	RCA index
Germany	108,685.5	22.4	2.4	33,061.5	14.7	1.5
Japan	79,769.3	16.4	2.8	25,277.4	11.2	1.9
United States	31,277.2	6.4	0.7	31,187.6	13.9	1.6
Canada	37,200.8	7.7	2.2	13,405.8	6.0	1.7
France	33,894.0	7.0	1.7	15,362.8	6.8	1.6
Belgium	28,939.9	6.0	1.8	6,190.0	2.8	0.8
Spain	24,088.2	5.0	2.6	10,563.8	4.7	2.5
Korea	27,256.1	5.6	2.0	7,719.0	3.4	1.2
United Kingdom	24,124.8	5.0	1.3	7,634.6	3.4	0.9
Mexico	13,404.4	2.8	1.3	9,788.2	4.4	2.1
Italy	7,824.2	1.6	0.4	12,168.9	5.4	1.5
Sweden	8,126.4	1.7	1.3	3,929.9	1.7	1.4
Netherlands	2,756.7	0.6	0.2	2,436.8	1.1	0.3

Source: International Trade Center (ITC), UNCTAD/WTO database, <http://www.intracen.org>. Notes: RCA = revealed comparative advantage. HS 8703 refers to motor cars and other motor vehicles, including station wagons and racing cars, principally designed for the transport of persons; HS 8708 refers to parts and accessories of motor vehicles of headings 8701 to 8705 (for further categories, see note for Table 9).

**Table 7: Trends of RCA Index in Automobile Sector, 2001–2005**

Country	2001	2002	2003	2004	2005
<b>Automobile sector (HS 87)</b>					
Germany	1.9	1.9	1.9	1.9	2.0
Japan	2.2	2.4	2.3	2.2	2.4
United States	0.9	0.9	0.9	1.0	1.0
France	1.4	1.5	1.5	1.6	1.6
Korea	1.1	1.1	1.2	1.4	1.5
<b>Passenger cars (HS 8703)</b>					
Germany	2.3	2.3	2.3	2.2	2.4
Japan	2.6	2.8	2.7	2.6	2.8
United States	0.5	0.6	0.6	0.6	0.7
France	1.4	1.6	1.6	1.7	1.7
Korea	1.6	1.5	1.7	1.9	2.0
<b>Parts and accessories (HS 8708)</b>					
Germany	1.3	1.4	1.4	1.5	1.5
Japan	1.7	1.7	1.8	1.8	1.9
United States	1.8	1.8	1.6	1.6	1.6
France	1.8	1.7	1.7	1.7	1.6
Korea	0.6	0.6	0.8	0.9	1.2

Source: Author's calculations. Note: HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof. HS 8703 refers to motor cars and other motor vehicles, including station wagons and racing cars, principally designed for the transport of persons; HS 8708 refers to parts and accessories of motor vehicles of headings 8701 to 8705 (for further categories, see note for Table 9).

In summary, Korea revealed a comparative advantage in its automobile sector, especially significant in passenger cars, and a marginal comparative advantage in parts and accessories for automobiles. Korea continued to improve its comparative advantage rapidly in the automobile sector in both passenger cars, and parts and accessories for automobiles even though its comparative advantage is still not as significant in parts and accessories for automobiles. The United States stands between comparative advantage and comparative disadvantage in the automobile sector as a whole, and its RCA index has shown improvement. The United States showed a comparative disadvantage in passenger cars but a comparative advantage in parts and accessories for automobiles, with decreasing trends in recent years.

## International Trade in the Automobile Sector—Korea and the United States

### Korea

**Korea's automobile sector imports and exports.** The Korean economy recorded a dramatic increase in its auto-mobile sector exports, from \$3.8 billion in 1988 to \$42.6 billion in 2006 (*Table 8*). The automobile sector accounted for about 13.1 percent of the Korean economy's total merchandise exports in 2006. However, imports in the automobile sector have not grown fast relative to exports: from \$730.6 million in 1988 to \$5,242.0 million in 2006. The automobile sector accounted for about 1.7 percent of the Korean economy's total merchandise imports in 2006. As a result, the net trade or trade balance in Korea's automob-ile sector was \$37.36 billion, which is more than double Korea's aggregate trade surplus in 2006.

Passenger cars (HS 8703), and parts and accessories for automobiles (HS 8708) are two major subcategories in Korea's automobile sector trade. They explained about 94.0 percent of exports and 84.9 percent of imports in Korea's automobile sector trade in 2006 (*Table 9*). Thus, our focus will be on these two subcategories.

Among its major trading partners, Korea's automobile sector exports largely concentrate on the U.S. market (*Table 10*) although the share has decreased rapidly as Korea's export market has diversified in the process of its export growth. More specifically, 87.2 percent of Korea's passenger car exports and 49.9 percent of parts and accessories for automobiles exports were directed to the U.S.



**Table 8: Korea's International Trade in the Automobile Sector (HS 87), 1988–2006, in millions of dollars**

Year	Exports (X)	Imports (M)	Net trade (X–M)
1988	3,806.6 (6.3%)	730.6 (1.4%)	3,076.0 (34.6%)
1990	2,324.1	930.3	1,393.8
1995	9,358.5	2,070.2	7,288.3
2000	15,265.5	1,631.3	13,634.3
2001	15,400.6	1,804.9	13,595.7
2002	17,266.3	2,644.4	14,622.0
2003	23,024.6	3,175.3	19,849.3
2004	32,106.2	3,584.9	28,521.2
2005	37,491.2	4,193.2	33,298.1
2006	42,605.3 (13.1%)	5,242.0 (1.7%)	37,363.3 (232.3%)

Source: Korea International Trade Association (KITA), KOTIS database, <http://stat.kita.net>. Notes: The numbers in the parenthesis are share of total merchandise exports, imports, or net trade in Korea. HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

**Table 9: Korea's International Trade in the Automobile Sector by Major Subcategories, 2006, in millions of dollars**

HS heading	Exports (X)	Imports (M)	Net trade (X–M)
HS 87	42,605.3	5,242.0	37,363.3
HS 8701	238.0	183.7	54.3
HS 8702	523.1	5.5	517.6
HS 8703	30,597.2	1,902.9	28,694.3
HS 8704	1,447.6	144.1	1,303.6
HS 8705	90.5	96.7	-6.3
HS 8706	37.7	0.5	37.2
HS 8707	3.1	0.1	3.0
HS 8708	9,458.1	2,548.4	6,909.7
HS 8709	7.5	45.8	-38.3

Source: Korea International Trade Association (KITA), KOTIS database, <http://stat.kita.net>. Note: HS chapter 87 and headings 8701 to 8709 include commodities as follows.

HS 87 vehicles other than railway or tramway rolling stock, and parts and accessories thereof

HS 8701 tractors (other than tractors of heading 8709)

HS 8702 motor vehicles for the transport of 10 or more persons, including the driver

HS 8703 motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars

HS 8704 motor vehicles for the transport of goods

HS 8705 special purpose motor vehicles, other than those principally designed for the transport of persons or goods

HS 8706 chassis fitted with engines, for the motor vehicles of headings 8701 to 8705

HS 8707 bodies (including cabs), for the motor vehicles of headings 8701 to 8705

HS 8708 parts and accessories of the motor vehicles of headings 8701 to 8705

HS 8709 work trucks, self-propelled, not fitted with lift.

market in 1988. These shares declined to 40.7 percent and 25.2 percent, respectively, in 2006. Recently, China emerged as one of the major export markets for Korea's parts and accessories for automobiles, and exports to China accounted for about one-third of Korea's parts and accessories for automobiles exports.

For Korea's automobile sector imports, Japan remained the largest source of Korea's imported parts and accessories for automobiles even though Japan's share has decreased from 82.2 percent in 1988 to 36.6 percent in 2006. Korea has diversified its sources and now imports more from Germany, the United States, and, recently, China. Regarding Korea's imports of passenger cars, the U.S. share has decreased from 65.3 percent in 1989 (not shown) and 50.6 percent in 1990 to 5.0 percent in 2006 as Germany and Japan increased their shares in 2006 to 59.0 percent and 22.0 percent, respectively.<sup>7</sup>

One thing we have to remember is that since 1997, even with the rapid growth of passenger car exports, Korea's trade balance in parts and accessories for automobiles has been transformed from deficit to surplus. This could have been the result of Korea's large investment in research and development and support from the growth of its stable domestic market.

**Domestic automobile market in Korea.** Since the 1987 liberalization of laws governing the importation into Korea of passenger cars, the sales and registrations of imported passenger cars have been increasing rapidly (*Table II*). The share of imports in Korea's passenger car sales and registrations in terms of number of units has increased from less than 0.1 percent in 1988 to more than 5 percent in 2007.<sup>8</sup> These changes might have resulted from the overall socioeconomic progress toward trade liberalization, improvement in consumer perceptions about imports, and above all the reduced price gap between domestic and imported passenger cars. As the share of imported passenger car sales and registrations increased quickly, the share of imports by country of origin also changed significantly (*Table 12*). For example, the share of imports from the United States has decreased significantly, from 49.2 percent in 1996 to 11.7 percent in 2007. In contrast, the share of imports from Japan has increased rapidly since the abolition of the Import Source Diversification Program (see note 7) in 1999, from zero percent in 2000 to 33.0 percent in 2007. The share of imports from the European Union (mostly from

**Table 10: Trends in Korea's Automobile Sector Trade by Major Country, 1988–2006, in millions of dollars and percentage**

Exports									
Year	Total (dollars, millions)	United States (%)	Canada (%)	United Kingdom (%)	Germany (%)	Italy (%)	Spain (%)	Australia (%)	China (%)
HS 87									
1988	3,806.6	82.3	4.4	1.2	0.1	0.5	0.0	0.6	0.2
1990	2,324.1	55.5	13.4	1.2	0.1	1.3	0.2	2.6	0.2
1995	9,358.5	17.9	1.1	4.2	7.2	1.6	2.2	4.7	2.5
2000	15,265.5	36.4	3.6	2.9	2.2	3.9	3.4	3.5	1.1
2001	15,400.6	41.9	4.4	2.7	2.5	3.4	2.6	2.5	1.3
2002	17,266.3	44.4	5.0	2.8	2.6	3.2	2.6	2.2	2.1
2003	23,024.6	39.7	5.0	2.7	3.8	3.2	2.9	2.0	5.9
2004	32,106.2	34.5	4.3	3.3	3.4	2.9	3.9	2.1	6.5
2005	37,491.2	28.3	3.7	3.0	3.6	3.2	3.9	2.4	8.6
2006	42,605.3	26.3	3.3	2.4	3.7	2.9	3.9	2.5	7.4
HS 8703									
1988	3,336.2	87.2	4.6	1.1	0.0	0.6	0.0	0.5	0.0
1990	1,856.3	60.3	15.4	1.2	0.0	1.0	0.1	2.8	0.2
1995	7,242.8	20.3	1.2	5.1	8.6	1.9	2.8	5.7	1.4
2000	11,896.0	42.3	4.5	3.5	2.4	4.7	4.1	4.2	0.4
2001	12,029.4	48.9	5.3	3.2	2.7	4.1	3.2	2.8	0.9
2002	13,466.8	51.5	6.0	3.4	2.9	3.9	3.2	2.4	1.4
2003	17,535.7	47.3	6.3	3.3	4.5	4.0	3.7	2.1	2.5
2004	24,632.1	40.7	5.3	4.1	3.9	3.7	4.8	2.1	1.7
2005	17,535.7	47.3	6.3	3.3	4.5	4.0	3.7	2.1	2.5
2006	24,632.1	40.7	5.3	4.1	3.9	3.7	4.8	2.1	1.7
HS 8708									
1988	184.7	49.9	5.0	1.9	0.5	0.4	0.7	2.2	0.0
1990	245.8	49.8	7.6	2.0	0.7	0.5	1.0	2.7	0.1
1995	652.9	26.3	2.6	2.6	4.0	0.7	0.7	3.4	2.6
2000	1,745.8	22.3	1.4	1.0	2.0	0.8	0.4	2.0	3.0
2001	1,867.6	25.3	1.8	1.0	2.0	0.6	0.4	1.8	2.7
2002	2,288.3	26.4	2.0	1.0	1.9	0.5	0.3	1.8	5.1
2003	3,694.5	18.2	1.5	0.9	2.0	0.4	0.2	1.5	22.9
2004	5,271.3	16.6	1.4	0.7	2.0	0.4	0.3	1.8	31.0
2005	7,719.0	23.6	1.3	0.7	1.7	0.4	0.2	1.3	33.5
2006	9,458.1	25.2	1.3	0.9	1.4	0.4	0.3	1.1	26.9

Imports									
Year	Total (dollars, millions)	Germany (%)	Japan (%)	United States (%)	Sweden (%)	United Kingdom (%)	France (%)	Italy (%)	China (%)
HS 87									
1988	730.6	6.3	67.1	12.5	0.5	1.3	0.9	2.8	0.0
1990	930.3	13.7	47.0	19.4	7.1	3.2	1.0	1.5	0.4
1995	2,070.2	19.3	37.7	24.5	5.6	2.2	1.4	2.6	0.7
2000	1,631.3	14.7	40.4	20.9	2.4	1.1	0.3	2.5	3.6
2001	1,804.9	16.5	38.4	18.8	3.2	0.9	0.3	3.1	2.9
2002	2,644.4	22.3	33.0	15.5	3.9	2.8	0.6	2.4	3.3
2003	3,175.3	26.6	30.0	14.6	4.3	2.8	0.9	2.1	3.2
2004	3,584.9	29.9	28.4	14.3	3.1	3.2	1.1	2.8	4.0
2005	4,193.2	31.1	27.6	12.3	2.6	2.5	1.0	3.0	6.2
2006	5,242.0	32.7	27.3	11.0	2.4	2.0	1.3	2.3	8.7
HS 8703									
1988	50.7	15.5	8.1	31.1	3.8	0.3	1.3	22.5	0.0
1990	98.5	22.3	6.6	50.6	5.9	3.3	2.8	1.3	0.0
1995	226.8	42.7	3.8	32.3	9.6	1.6	2.5	0.6	0.1
2000	154.9	51.8	7.7	18.5	6.4	3.7	0.2	0.1	1.0
2001	249.7	55.8	17.2	12.5	4.6	0.9	0.2	0.1	0.1
2002	603.7	59.4	18.7	10.6	2.7	1.2	0.2	0.4	0.1
2003	762.0	63.3	16.7	8.6	3.3	1.2	0.5	0.6	0.1
2004	909.4	55.7	25.8	7.1	2.7	1.5	1.2	0.6	0.1
2005	1,370.0	54.3	22.2	6.8	3.1	1.6	1.7	1.0	0.1
2006	1,902.9	59.0	22.0	5.0	1.7	1.8	2.1	1.0	0.1
HS 8708									
1988	536.8	5.3	82.2	9.3	0.1	1.0	1.0	0.0	0.0
1990	483.1	9.4	65.9	17.5	0.9	1.6	0.6	0.3	0.0
1995	1,301.2	13.4	54.0	23.1	2.3	1.1	0.9	0.7	0.1
2000	1,206.3	11.0	49.1	21.0	1.3	0.4	0.3	1.6	1.9
2001	1,193.6	10.5	50.0	19.6	1.4	0.6	0.3	2.9	0.8
2002	1,536.8	12.5	45.0	16.9	1.6	3.9	0.9	2.7	1.0
2003	1,772.3	15.4	43.0	15.7	1.5	4.2	1.4	2.8	1.4
2004	1,965.7	21.5	36.6	16.2	1.5	5.0	1.5	3.7	2.4
2005	2,197.1	20.6	36.5	15.9	1.0	3.4	0.9	4.1	6.2
2006	2,548.4	17.5	36.6	15.5	1.0	2.5	1.0	2.7	11.2

Source: Calculated by author from Korea International Trade Association (KITA), KOTIS database, <http://stat.kita.net>. Note: HS chapter 87 and headings 8703 and 8708 include commodities as follows.

HS 87	vehicles other than railway or tramway rolling stock, and parts and accessories thereof
HS 8703	motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars
HS 8708	parts and accessories of the motor vehicles of headings 8701 to 8705.

**Table 11: Imports in Korea's Passenger Car Market, 1988–2007, in number of units and percentage of Table 14: U.S. Trade in the Automobile Sector (HS 87), 1995–2007, in millions of dollars and imports percentage**

Year	Domestic			Imports	
	Production	Exports	Sales (A)	Sales (B)	Share (B/[A+B])
1988	872,074	564,511	323,561	263	0.08%
1990	986,751	339,672	626,126	2,325	0.37%
1995	2,003,146	856,368	1,149,409	6,921	0.60%
2000	2,602,008	1,544,473	1,057,620	4,414	0.42%
2001	2,471,444	1,397,015	1,065,161	7,747	0.73%
2002	2,651,723	1,413,723	1,225,210	16,119	1.32%
2003	2,767,716	1,720,124	1,001,874	19,481	1.94%
2004 <sub>a</sub>	3,122,600	2,276,576	857,977	23,345	2.65%
2005 <sub>a</sub>	3,357,094	2,456,525	913,550	30,901	3.27%
2006 <sub>a</sub>	3,489,136	2,530,180	953,681	40,530	4.15%
2007 <sub>a</sub>	3,723,482	2,718,548	986,416	53,390	5.13%

Source: Korea Automobile Importers and Distributors Association, <http://www.kaida.co.kr>.

a. Beginning in 2004, “number of units” refers to registrations of units made instead of sales.

**Table 12: Imports by Country of Origin in Korea's Passenger Car Market, 1994–2007, number of units and percentage**

Year	United States		European Union		Japan	
	Sales	Share	Sales	Share	Sales	Share
1994	1,903	49.2%	1,962	50.8%	0	0.0%
1995	2,578	37.2%	4,343	62.8%	0	0.0%
2000	1,238	28.0%	3,176	72.0%	0	0.0%
2001	1,502	19.4%	5,404	69.8%	841	10.9%
2002	2,969	18.4%	10,182	63.2%	2,968	18.4%
2003	3,172	16.3%	12,535	64.3%	3,774	19.4%
2004 <sub>a</sub>	3,509	15.0%	12,999	55.7%	6,837	29.3%
2005 <sub>a</sub>	3,811	12.3%	18,010	58.3%	9,080	29.4%
2006 <sub>a</sub>	4,556	11.2%	23,769	58.6%	12,205	30.1%
2007 <sub>a</sub>	6,235	11.7%	29,522	55.3%	17,633	33.0%

Source: Korea Automobile Importers and Distributors Association, <http://www.kaida.co.kr>.

a. Beginning in 2004, “number of units” refers to registrations of units made instead of sales.

**Table 13: Passenger Car Registrations and Sales in Korea, by Engine Cylinder Capacity, 2005, number of units and percentage**

Automobiles		Less than or equal to 2,000 cc		Greater than 2,000 cc	
		Number	Percentage	Number	Percentage
		Domestic	Registration	8,882,005	80.2
	Sales	482,931	52.9	430,619	47.1
Imports	Registration	33,280	21.6	120,956	78.4
	Sales	7,163	23.2	23,738	76.8

Source: Korea Automobile Importers and Distributors Association, <http://www.kaida.co.kr>.

Germany) has somewhat decreased and remained around 60 percent in recent years.

Recently consumer demand in Korea has narrowed the gap in engine cylinder capacity between domestic passenger cars and imports (*Table 13*). For example, the share of passenger cars registered with an engine cylinder capacity greater than 2,000 cc was 19.8 percent for domestic automobiles and 78.4 percent for imports in 2005. However, the share of passenger cars sold with an engine cylinder capacity greater than 2,000 cc was 47.1 percent for domestic autos and 76.8 percent for imports in the same year.

## United States

**U.S. automobile sector imports and exports.** U.S. exports in the automobile sector grew steadily from \$51.78 billion in 1995 to \$106.99 billion in 2007 (*Table 14*). Automobile exports as a share of total U.S. merchandise exports maintained a position at about 9 percent. U.S. exports in the automobile sector to Korea decreased during the early 2000s, mainly because of the Asian financial crisis, and, accordingly, Korea's share in the U.S. automobile sector exports fell from 1.3 percent in 1995 to 0.6 percent in 2003, although it recovered to 0.9 percent in 2007. U.S. imports in the automobile sector also grew steadily, from \$102.33 billion in 1995 to \$214.47 billion in 2007. However, the automobile sector's share of total U.S. merchandise imports fell from 13.8 percent to 11.0 percent during the same period.

U.S. automobile sector imports from Korea grew rapidly, from \$1.82 billion in 1995 to \$10.55 billion in 2007. Thus, Korea's share of U.S. automobile sector imports rose from 1.8 percent to 4.9 percent during the same period. The U.S. trade balance for the automobile sector recorded a \$50.55 billion deficit in 1995 (equivalent to 31.3 percent of the total U.S. trade deficit in 1995). While the amount of automobile sector trade deficit has risen to \$107.47 billion, the ratio compared with the total U.S. trade deficit fell to 13.6 percent in 2007. Overall, the U.S. trade performance in automobiles has somewhat stabilized since 2003 or so.

**Domestic automobile market in the United States.** U.S. domestic automobile registrations were 241.2 million units for all vehicles (136.6 million cars and 103.8 million trucks) in 2005 (*Table 15a*). Registrations of cars showed a decreasing trend beginning in 2002 and 2003 while registrations of trucks continued to increase. Total automobile sales were 17.0 million units in 2006 (7.8 million cars and 8.7 million light trucks) and revealed a decreasing trend after 2001 (*Table 15b*). Because total



**Table 14: U.S. Trade in the Automobile Sector (HS 87), 1995–2007, in millions of dollars and imports percentage**

<b>Exports</b>					
Year	Total merchandise exports (A)	Automobile sector exports to the world		Automobile sector exports to Korea	
		Value (B)	Percentage (B/A*100)	Value (C)	Percentage (C/B*100)
1995	582,076.8	51,775.7	8.9	658.6	1.3
2000	780,418.6	61,927.6	7.9	450.0	0.7
2001	731,025.9	58,749.5	8.0	427.9	0.7
2002	693,257.3	62,511.2	9.0	449.1	0.7
2003	723,743.2	65,182.4	9.0	414.7	0.6
2004	816,547.6	73,099.8	9.0	543.0	0.7
2005	904,379.8	83,160.6	9.2	682.3	0.8
2006	1,037,143.0	92,702.8	8.9	756.8	0.8
2007	1,162,708.3	106,993.5	9.2	962.2	0.9
<b>Imports</b>					
Year	Total merchandise imports (A)	Automobile sector imports from the world		Automobile sector imports from Korea	
		Value (B)	Percentage (B/A*100)	Value (C)	Percentage (C/B*100)
1995	743,500.0	102,329.0	13.8	1,815.5	1.8
2000	1,216,887.5	163,854.3	13.5	5,306.1	3.2
2001	1,141,959.1	159,341.5	14.0	6,803.3	4.3
2002	1,163,548.6	170,515.8	14.7	7,394.2	4.3
2003	1,259,395.6	175,164.8	13.9	8,631.6	4.9
2004	1,469,670.8	191,249.6	13.0	10,898.8	5.7
2005	1,670,940.4	199,805.9	12.0	10,203.3	5.1
2006	1,855,119.3	215,378.7	11.6	10,852.7	5.0
2007	1,953,698.8	214,466.7	11.0	10,550.5	4.9
<b>Trade balance</b>					
Year	U.S. trade balance (A)	Automobile sector trade balance		Automobile sector trade balance with Korea	
		Value (B)	Percentage (B/A*100)	Value (C)	Percentage (C/B*100)
1995	-161,423.2	-50,553.3	31.3	-1,156.9	2.3
2000	-436,468.9	-101,926.7	23.4	-4,856.1	4.8
2001	-410,933.2	-100,592.0	24.5	-6,375.4	6.3
2002	-470,291.3	-108,004.6	23.0	-6,945.1	6.4
2003	-535,652.5	-109,982.4	20.5	-8,216.9	7.5
2004	-653,123.1	-118,149.8	18.1	-10,355.8	8.8
2005	-766,560.6	-116,645.3	15.2	-9,521.0	8.2
2006	-817,976.3	-122,675.9	15.0	-10,095.9	8.2

Source: Calculated by author from Korea International Trade Association (KITA), KOTIS database, <http://stat.kita.net>. Note: HS 87 refers to vehicles other than railway or tramway rolling stock, and parts and accessories thereof. .

domestic production was about 11.3 million units (4.4 million cars and 6.4 million light trucks) in 2006, the difference between domestic production and sales—5.7 million units (3.4 million cars and 2.3 million light trucks)—was imported units.

**Table 15a: Automobile Registrations in the United States, 1999–2003, in millions of units** **Table 16: U.S. Exports and Imports of Passenger Cars and Light Trucks, 1999–2004, in millions of dollars (exports: FAS; imports: customs value)**

Year	Cars	Trucks	All vehicles
1999	132.4	83.1	216.3
2000	133.6	87.1	221.5
2001	137.6	92.0	230.4
2002	135.9	92.9	229.6
2003	135.7	94.9	231.4
2004	136.4	100.0	236.4
2005	136.6	103.8	241.2

**Table 15b: Automobile Sales and Production in the United States, 1998–2004, in millions of units**

Year	Light vehicles			Medium and heavy trucks	Total	Total LV
	Cars	Light trucks	Total			
<b>Sales</b>						
1998	8.1	7.4	15.5	0.4	16.0	
1999	8.7	8.2	16.9	0.5	17.4	
2000	8.8	8.5	17.3	0.5	17.8	
2001	8.4	8.7	17.1	0.4	17.5	
2002	8.2	8.7	16.9	0.3	17.2	
2003	7.6	9.0	16.6	0.3	16.9	
2004	7.5	9.3	16.8	0.4	17.3	
2005	7.7	9.2	16.9	0.5	17.4	
2006	7.8	8.7	16.5	0.5	17.0	
<b>Production</b>						
1998	5.6	6.0	11.6	0.4	12.0	
1999	5.6	7.0	12.6	0.4	13.0	
2000	5.5	6.8	12.4	0.4	12.8	
2001	4.8	6.3	11.2	0.3	11.4	
2002	5.0	7.0	12.0	0.3	12.3	
2003	4.5	7.3	11.8	0.3	12.1	
2004	4.2	7.3	11.6	0.4	12.0	
2005	4.3	7.2	11.5	0.4	11.9	
2006	4.4	6.4	10.8	0.5	11.3	

Source: The Road Ahead for the U.S. Auto Market (Washington, D.C.: U.S. Department of Commerce, Office of Aerospace and Automotive Industries, March 2007), <http://www.ita.doc.gov/td/auto/domestic/2007RoadAhead.pdf>.

The top five sources of passenger cars and light trucks that were imported into the United States were Canada, Japan, Germany, Mexico, and Korea (**Table 16**). Canada had a 29.0 percent share; Japan, 28.9 percent; Germany, 14.6 percent; Mexico, 13.0 percent; and Korea, 5.9 percent in 2006. Together they accounted for more than 90 percent of U.S. imports of passenger cars and light trucks.

Recently the shares of Germany and Korea have been increasing while Canada's share has been decreasing. The top five markets to which the United States exported passenger cars and light trucks were Canada, Germany, Mexico, Saudi Arabia, and the UK. Individual countries' shares in 2006 were: Canada 45.0 percent, Germany 12.9 percent, Mexico 10.4 percent, Saudi Arabia 5.6 percent, and the UK 3.2 percent. Canada had a major share with a decreasing trend, and Germany's share was growing rapidly.

## Effect of the Korea-U.S. Free Trade Agreement on the Automobile Sector

### Major Results from Automobile Sector Negotiations

Negotiations leading to the Korea-U.S. Free Trade Agreement (KORUS FTA) were finalized on 2 April 2007. The automobile sector was one of the major sectors on the negotiation agenda, together with beef, pharmaceuticals, and the screen quota. The United States has the world largest automobile market, with a demand for about 17 million units of brand-new automobiles annually, as was shown in Table 15. Korea also has a stable domestic market with a demand for about 1 million units of brand-new automobiles a year, with a rapidly increasing demand for imports, shown in Table 11. Korea exports approximately 600,000 units of passenger cars to the U.S. market each year.<sup>9</sup> Korea imported over 6,000 units of passenger cars from the United States in 2007.

Tariffs are 8 percent in Korea and 2.5 percent in the United States for passenger cars and parts and accessories for automobiles; tariffs are 10 percent in Korea and 25 percent in the United States for trucks. Most of the tariff barriers in Korea will be eliminated on the date the KORUS FTA enters into force. The tariff barriers in the United States will be eliminated on the date the KORUS FTA enters into force, with some exceptions: For passenger cars with spark ignition internal combustion engines with cylinder capacity greater than 3,000 cc or with a compression ignition internal combustion engine, the tariffs in the United States will be removed in three equal annual stages beginning on the date the KORUS FTA enters into force. Such passenger cars will be duty-free, effective January 1 of year three.<sup>10</sup> For trucks, tariffs in the United States will be removed in 10 equal annual stages beginning on the date the KORUS FTA enters into force and will be duty-free, effective January 1 of year 10.

In addition, domestic taxes on passenger cars in Korea will be simplified and will benefit the passenger cars with larger engine cylinder capacities. For automobiles produced by an automotive manufacturer that sells 10,000

**Table 16: U.S. Exports and Imports of Passenger Cars and Light Trucks, 1999–2004, in millions of dollars (exports: FAS; imports: customs value)**

	1999	2000	2001	2002	2003	2004	2005	2006
<b>Exports</b>								
World	20,606	21,646	21,348	24,606	26,838	29,499	35,374	40,179
Top five markets								
Canada	12,363	12,648	11,214	13,526	14,082	14,686	16,184	18,083
Germany	1,175	1,177	1,768	2,786	3,928	3,980	3,661	5,177
Mexico	2,387	3,462	3,755	3,799	3,178	3,987	4,438	4,160
Saudi Arabia	493	646	848	901	660	1,040	2,162	2,267
United Kingdom	533	333	523	624	863	852	821	1,006
<b>Imports</b>								
World	108,521	122,035	120,317	127,562	127,906	135,148	136,450	148,364
Top five sources								
Canada	42,264	42,246	38,436	39,056	38,332	43,255	44,009	43,058
Japan	29,191	32,092	30,559	34,344	31,596	31,625	34,413	42,898
Germany	13,459	14,649	15,004	17,796	19,711	20,345	16,945	21,701
Mexico	13,816	20,211	20,727	19,773	18,261	17,407	20,307	19,233
Korea	2,879	4,839	6,341	6,796	7,933	10,040	8,769	8,761

Source: The Road Ahead for the U.S. Auto Market (Washington, D.C.: U.S. Department of Commerce, Office of Aerospace and Automotive Industries, March 2007), <http://www.ita.doc.gov/td/auto/domestic/2007RoadAhead.pdf>.

or fewer units per year in Korea, the requirement in the ministerial notice adopted pursuant to the Air Quality Conservation Act will not be applied. It is expected that most of the trade concerns between Korea and the United States in the automobile sector will be resolved with the passage of the KORUS FTA.

### Potential Impact of the KORUS FTA

To examine the potential effects of the KORUS FTA in the automobile sector, the GTAP model (version 6, with the year 2001 based data set) was used.<sup>11</sup> The GTAP model is a multiregion, multisector, computable general equilibrium model and offers a standard modeling framework to conduct quantitative analyses of international trade issues in a global and economywide context. In version 6 of the GTAP database, we can model the world economy for up to 87 countries and regions, and 57 commodities and industries.

**Model specifications.** For the purpose of our analysis, the 87 countries and regions in the GTAP model were consolidated into 8 countries and regions as follows (*Table 17*): Korea (KOR), the United States (US), other American countries (OAM), Japan (JAP), other Asian and Oceania countries (OAS), EU member countries (EU), other European countries (OEU), and the rest of the world (ROW). To simplify our analysis, 57 commodities and industries in the GTAP model were grouped into 8 categories: agriculture, fishery, and food (AGF); textiles and other manufacturing (TOM); chemical prod-

ucts (CHM); mineral and metal products (MMT); automobiles and parts (AMP);<sup>12</sup> other transportation equipment (OTE); electric and electronic equipment (EEM); construction and other services (CSV).

**Parameters of concern.** Tariffs on automobiles and parts are one of the most important parameters for our analysis. Trade-weighted bilateral tariffs for automobiles and parts between two countries or regions concerned can be calculated from the GTAP database. For example, they are calculated as 7.9 percent for Korea's imports from the United States and 2.4 percent for U.S. imports from Korea (*Table 18*).

Other behavioral parameters important for the analysis are elasticity of substitution between domestic goods and aggregate imports and that between the imports from different countries of origin (based on the Armington assumption). The former was assumed as 2.8 and the latter as 5.6 for automobiles and parts in the GTAP model version 6. The elasticity of substitution determines the conditional price responsiveness to demand for domestic goods or imports from different countries of origin.

**Table 17: Symbols Used in the Model – Country and Commodity Classification**

Countries and regions	Symbol
Korea	KOR
United States	US
Other American countries	OAM
Japan	JAP
Other Asian and Oceania countries	OAS
European Union member countries	EU
Other European countries	OEU
Rest of the world	ROW
Commodities and industries	
Agriculture, fishery, and food	AGF
Textiles and other manufacturing	TOM
Chemical products	CHM
Mineral and metal products	MMT
Automobiles and parts	AMP
Other transportation equipment	OTE
Electric and electronic equipment	EEM
Construction and other services	CSV

Source: Reclassified from GTAP database; see Global Trade Analysis Project at Purdue University, <http://www.gtap.agecon.purdue.edu>.

**Table 18: Trade-Weighted Bilateral Tariffs for Automobiles and Parts, percentage**

Exporter	Importer							
	KOR	US	OAM	JAP	OAS	EU	OEU	ROW
KOR	0.0	2.4	15.4	0.0	36.4	10.3	4.2	18.9
US	7.9	0.0	0.9	0.0	19.0	6.4	5.2	12.9
OAM	8.0	0.0	12.2	0.0	24.4	1.6	4.0	19.9
JAP	7.9	2.4	12.5	0.0	24.2	8.6	5.5	10.3
OAS	7.4	1.4	9.8	0.0	16.6	4.4	4.2	11.2
EU	8.0	2.2	14.4	0.0	27.7	0.3	3.5	14.5
OEU	7.5	1.0	11.5	0.0	18.4	1.0	2.1	26.1
ROW	7.5	0.0	12.0	0.0	19.5	3.8	3.5	7.4

Source: Calculated from the GTAP database, version 6; see Global Trade Analysis Project at Purdue University, <http://www.gtap.agecon.purdue.edu>.

Policy simulations. For the base policy simulation (SIM I), tariffs on automobiles and parts are assumed to be removed between the two signatories to the KORUS FTA (see *Table 19*). To pinpoint the effects of the FTA in automobiles and parts, tariffs in other sectors remain unchanged. As an alternative policy simulation (SIM II), we tried to consider improvements in consumer perceptions of imported automobiles in addition to the elimination of tariffs in automobiles and parts between Korea and the United States. To incorporate the improvement in the GTAP model, we adjust the Armington elasticity, the degree of substitution between domestic and imported automobiles and parts (2.8) to be the same value as the elasticity of substitution among the imports from different countries of origin in the same sector (5.6).<sup>13</sup> So, conditional price responsiveness in consumer demand will be the same between domestic goods and imports and among imports from different countries of origin in the automobile sector.

**Table 19: Policy Simulations**

	Description
SIM I	Base simulation: Tariff barriers are removed between Korea and the United States in automobiles and parts. Tariff barriers in other commodities and industries and in other countries and regions remain unchanged.
SIM II	Alternative simulation: In addition to SIM I. Modify the Armington parameter for automobiles and parts (2.8) as the same value as the elasticity of substitution among the imports from different country of origin in the same sector (5.6).

Source: Author’s calculations.

Because of tariff elimination for automobiles and parts between Korea and the United States (SIM I), exports and imports in the sector are calculated as increasing in the two FTA signatory countries. From the base simulation (SIM I), exports from Korea to the United States are calculated to increase by 12.8 percent and from the United States to Korea by 40.1 percent, reflecting the difference in tariffs between the two countries (*Table 20a*). By applying these rates of change to base-year (2001) bilateral trade data (from Korea to the United States \$6,969.4 million, and from the United States to Korea \$323.8 million; see *Table 20b*), we calculate an increase in value terms of bilateral exports of automobiles and parts from Korea to the United States of \$892.1 million and from the United States to Korea of \$129.8 million. Thus, the changes in the bilateral trade balance in the automobile sector will be a \$762.3 million increase in the surplus for Korea and an equivalent increase in the deficit for the United States.

By adding the improvement of consumer responsiveness for imports in the automobile sector (SIM II), we can get further increases in bilateral exports over the base simulation (SIM I), that is, from Korea to the United States an increase of \$20.9 million and from the United States to Korea an increase of \$6.8 million. The bilateral trade balance in the automobile sector will be changed further: a \$14.1 million increase in Korea’s surplus and in the U.S. deficit. That is, the improvement of consumer responsiveness for imports in the automobile sector will bring additional growth in bilateral trade between Korea and the United States in the automobile sector owing to the elimination of bilateral tariffs. The effects will be larger in value for Korea relative to the United States because Korea has a comparative advantage over the United States in the automobile sector; in other words, Korea has been much more successful in accessing the U.S. market than the United States has been in accessing the Korean market.<sup>14</sup>

**Table 20a: Bilateral Trade between Korea and the United States in the Automobile Sector**

Country	Bilateral exports in automobiles and parts (millions of dollars)	Changes in bilateral exports in automobiles and parts (percent)			Changes in bilateral exports in automobiles and parts (millions of dollars)		
	Value in base year	SIM I (A)	SIM II (B)	Net effect (B-A)	SIM I (A)	SIM II (B)	Net effect (B-A)
KOR to US	6,969.4	12.8	13.1	0.3	892.1	913.0	20.9
US to KOR	323.8	40.1	42.2	2.1	129.8	136.6	6.8

**Table 20b: Bilateral Trade between Korea and the United States in the Automobile Sector**

Country	Bilateral exports in automobiles and parts (millions of dollars)	Changes in bilateral trade balance in automobiles and parts (millions of dollars)		
	Value in base year	SIM I (A)	SIM II (B)	Net effect (B-A)
KOR	6,969.4	762.3	776.4	14.1
US	323.8	-762.3	-776.4	-14.1

Source: Author's calculations.

For the global trade in automobiles and parts, bilateral tariff elimination between Korea and the United States (SIM I) will increase the two countries' exports and imports of automobiles and parts at the expense of other countries (*Tables 21a* and *21b*). OAM and JAP will see the largest negative effect, followed by OAS, in both their exports and imports of automobiles and parts because they are competing with Korea in the U.S. market as well as competing with the United States in Korea's market. However, improvements in consumer responsiveness toward imports in the automobile sector in addition to the base simulation (SIM II) will diffuse the bilateral tariff elimination effects all over the world, and will increase every country's or region's exports and imports in the automobile sector, not just increase bilateral trade between Korea and the United States. As a result, the net effect (from SIM II over SIM I) will be beneficial all around the world except in Korea and the United States.

For welfare, Korea is calculated to have a \$178.1 million gain in value terms for (SIM I) and a \$161.7 million gain in value terms for (SIM II).<sup>15</sup> However, the United States is calculated to have a small loss, mostly caused by trade diversion effects: a \$19.9 million loss in value terms for (SIM I) and a \$47.4 million loss in value terms for (SIM II).

## Implications

We are able to derive some possible implications from the preceding discussion.

First, needless to say, every model or forecast has its weak points. The GTAP model, even with its strong characteristics of possessing a multicountry, multisector

analysis capability, is not an empirical statistical model but a mathematical calculation model, and it is heavily dependent on some parameters, for example, elasticity of substitution between domestic goods and imports, that are difficult to estimate and has to be assumed. So the simulation results need to be considered as a reference.

Second, we cannot overemphasize the importance of observing our economies on the whole. That is, even though the automobile sector is important for both Korea and the United States, we cannot totally separate the sector from those economies to arrive at a fair and balanced evaluation of economic effects from, for example, the KORUS FTA. Various industries and economic sectors are closely linked and complement each other.

Third, to gain benefits from trade liberalization or even from the improvement of consumer perceptions against imports, comparative advantage needs to be accompanied by other measures. In other words, trade liberalization is not a sufficient condition, but it is a necessary condition to achieve gains from trade expansion.

Fourth, we need to learn from competition and from our successful competitors. Successful competitors not only are the leaders of market trends but also are very responsive to the market. Every market wants variety but each has its own specific demands.

Fifth, both competition and cooperation are important. Korea and the United States are and can be complementary, especially in the future automobile market. They can cooperate further in designing, manufacturing, distributing, and servicing and maintaining automobiles as well as carry out research and development for next-genera-



**Table 21a: Policy Simulation Results of KORUS FTA: World Exports, Imports, and Trade Balance in the Automobile Sector, in millions of dollars and percentage**

Country or region	Exports in automobiles and parts			Imports in automobiles and parts			Trade balance in automobiles and parts		
	SIM I (A)	SIM II (B)	Net effect (B-A)	SIM I (A)	SIM II (B)	Net effect (B-A)	SIM I (A)	SIM II (B)	Net effect (B-A)
KOR	5.65	5.83	0.18	4.33	6.48	2.15	769.6	740.5	-29.1
US	0.17	0.22	0.05	0.21	0.40	0.19	-221.3	-485.2	-263.9
OAM	0.35	-0.18	0.17	-0.09	-0.05	0.04	-214.9	-113.2	101.7
JAP	0.22	-0.11	0.11	-0.02	0.0006	0.02	-179.0	-88.5	90.5
OAS	0.16	0.004	0.16	-0.004	0.006	0.01	-17.2	-1.5	15.7
EU	-0.06	-0.03	0.03	-0.01	-0.004	0.01	-144.1	-69.5	73.6
OEU	-0.04	-0.01	0.03	0.00003	0.002	0.002	-2.0	-1.1	0.9
ROW	-0.06	-0.03	0.03	-0.003	-0.0007	0.002	-1.6	-0.9	0.7

Source: Author's calculations. Note: Numbers for exports and imports are percent changes from the base year level due to policy simulation. Numbers in trade balance are value of changes in millions of dollars from the base year level due to policy simulation.

**Table 21b: Policy Simulation Results of KORUS FTA: World Production in the Automobile Sector, Overall Trade Balance, and Welfare (EV), in millions of dollars and percentage**

Country or region	Production in automobiles and parts			Trade balance (overall)			Welfare (EV)		
	SIM I (A)	SIM II (B)	Net effect (B-A)	SIM I (A)	SIM II (B)	Net effect (B-A)	SIM I (A)	SIM II (B)	Net effect (B-A)
KOR	2.77	2.65	-0.12	6.4	12.6	6.2	178.1	161.7	-16.4
US	-0.05	-0.12	-0.07	-83.6	-70.6	13.0	-19.9	-47.4	-27.5
OAM	-0.21	-0.11	0.10	15.7	9.2	-6.5	-43.9	-22.3	21.6
JAP	-0.10	-0.05	0.05	25.5	15.5	-10.0	-21.4	-2.5	18.9
OAS	-0.02	-0.004	0.02	7.5	7.5	0.0	-22.5	-15.7	6.8
EU	-0.04	-0.02	0.02	22.0	19.7	-2.3	-14.4	-3.4	11.0
OEU	-0.006	-0.004	0.002	2.1	2.6	0.5	0.2	0.6	0.4
ROW	-0.02	-0.01	0.01	4.3	3.5	-0.8	-5.3	-2.7	2.6

Source: Author's calculations. Note: Numbers for production are percent changes in automobile sector production from the base year level due to policy simulation. Numbers in overall trade balance and welfare (equivalent variation, or EV) are value of changes in million of dollars from the base year level due to policy simulation.

tion automobiles such as environmentally friendly and energy-efficient automobiles, hybrid or fuel-cell cars.

Sixth, the world automobile market is changing. Japan and Germany are not the only competitors. The emerging Chinese and Indian markets will be not only an opportunity but also a threat. Cooperation based on complementarity between Korea and the United States will maximize the opportunity and minimize the threat.

Seventh, Korea's market for automobile imports is growing as consumers are demanding upgrades for domestic automobiles, seeking price reductions because of parallel imports, and experiencing improvements in their perceptions of imports. Demand for imports has been diversifying from only luxury automobiles to ordinary automobiles. Japanese automakers have been active in responding to these market demands. U.S. automakers might want to use this opportunity because U.S. automobiles have a comparative advantage in the ordinary automobile market rather than in the luxury market in Korea. U.S. automakers need to be responsive to Korean

consumers because Korean automobile buyers are very selective.

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## Endnotes

<sup>1</sup> HS denotes the Harmonized Commodity Description and Coding System, known as the harmonized system. HS, developed by the World Customs Organization (WCO), is a multipurpose goods nomenclature used as the basis for tariffs and for the compilation of trade statistics all over the world.

<sup>2</sup> Refer to the Note following Table 9 for the subcategories under HS 87.

<sup>3</sup> The RCA index denotes comparative advantage in terms of export performances in international trade. More specifically, the RCA index of country *i* in commodity *j* is calculated as:  $RCA_{ij} = (X_{ij}/XW_j)/(X_i/XW)$ , where  $X_{ij}$  is country *i*'s exports of commodity *j*,  $XW_j$  is total world exports of commodity *j*,  $X_i$  is aggregate exports of country *i*, and  $XW$  is aggregate world exports. If the value of the RCA index is greater than 1, it implies that the country has a comparative advantage in the commodity concerned.

<sup>4</sup> Korea recorded significant improvements in its RCA index, from 0.4 in 1990 and 0.9 in 1995.

<sup>5</sup> Korea continued its rapid improvements in its RCA index from 0.6 in 1990 and 1.2 in 1995.

<sup>6</sup> Korea showed dramatic improvements in its RCA index from 0.16 in 1990 and 0.22 in 1995.

<sup>7</sup> The rapid growth of Japan's share in Korea's imports of passenger cars is closely related to the Import Source Diversification Program (ISDP). The program was designed to diversify the sources of imports for those goods for which Korea was running a chronic trade deficit from a single source. The ISDP was introduced in 1978 as a way of accelerating market opening while minimizing its adverse effects. Effectively, the program has served to reduce imports of certain goods, including passenger cars, from Japan, with which Korea had been running chronic trade deficits. With the abolition of the ISDP in June 1999, Korea liberalized imports of passenger cars from Japan.

<sup>8</sup> For reference, Japan removed tariff barriers on imports of passenger cars in 1979, and the share of imported passenger cars in Japan did not increase to more than 4 percent until the early 1990s. "Imports in terms of number of units" might have a different meaning from "imports in value" because imports are usually much more expensive than the average domestic passenger car. In terms of the number of units registered, the share of domestic passenger cars (including recreational vehicles) with an engine cylinder capacity over 2,000 cubic centimeters was about 19.8 percent in 2005, and the corresponding share for imports was about 78.4 percent in the same year.

<sup>9</sup> This number decreased from about 700,000 units a year after the opening of the Hyundai motor factory in Alabama.

<sup>10</sup> Approximately one-third, by value, of Korea's passenger car exports to the United States have corresponded to this category in recent years.

<sup>11</sup> GTAP stands for the Global Trade Analysis Project, a consortium organized by Purdue University. For further information, refer to Thomas Hertel, ed., *Global Trade Analysis: Modeling and Applications* (New York: Cambridge University Press, 1997); Betina V. Dimaranan, ed., *Global Trade, Assistance, and Production: The GTAP 6 Data Base* (West Lafayette, Ind.: Purdue University, Center for Global Trade Analysis, 2006); and the Web site of the Global Trade Analysis Project at Purdue University, [www.gtap.agecon.purdue.edu](http://www.gtap.agecon.purdue.edu).

<sup>12</sup> In the current GTAP database, automobiles and parts is considered as one commodity or industry that cannot be further disaggregated.

<sup>13</sup> Because of the restrictions of the GTAP model, the Armington parameters for automobiles and parts are assumed to be changed and the same value as the elasticity of substitution among the imports from different countries and regions for all countries and regions, including Korea and the United States.

<sup>14</sup> Nam Sang-yirl and Junsok Yang, "Potential Impact of Changes in Consumer Preferences on Trade in the Korean and World Motor Vehicle Industry," Working Paper 03-08 (Seoul: Korea Institute for International Economic Policy, 2003), showed that, when con-

sumer perceptions against imports were improved unilaterally in Korea's automobile sector, most of the beneficiary countries were the net exporters in the world automobile market—Japan and Germany, for example; beneficiaries were not net importers such as the United States.

<sup>15</sup> Welfare changes in the GTAP model are measured by equivalent variation (EV), which tries to find how much output is left over, or how much additional output is required in order to maintain the same consumption level after an exogenous shock as before the shock.



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