



**The Economic Impact of the
U.S.-Dominican Republic-Central America
Free Trade Agreement (DR-CAFTA)
on Florida**

by Mark Smith
Managing Director, Western Hemisphere Affairs
U.S. Chamber of Commerce

The Economic Impact of the U.S.-Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) on Florida

Executive Summary

Introduction:

The U.S.-Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) will provide substantial new trade-related economic opportunities for Florida businesses, workers and citizens. Already, the Central American countries and the Dominican Republic together form Florida's largest export market in the world, accounting for \$3.1 billion of exports in 2003. This study draws upon the experiences of the North American Free Trade Agreement (NAFTA) and the recent U.S.-Chile Free Trade Agreement and uses the U.S. Department of Commerce's Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II) to offer a vision of the potential impact of the DR-CAFTA on the Florida economy.

Results:

- \$958 million (one year after implementation) and \$5.1 billion in increased output across all industries (nine years after implementation);
- \$226 million (one year after implementation) and \$1.2 billion in increased earnings of employees in all industries (nine years after implementation); and
- 6,879 (one year after implementation) and 36,308 new jobs created (nine years after implementation).

Conclusion:

The DR-CAFTA presents a substantial opportunity for Florida's elected leaders to make a substantial positive contribution to the state's economic growth, increase worker incomes, and provide new opportunities for those who are seeking work in higher-paying, export-oriented jobs. While the Central American countries and the Dominican Republic are small, the cumulative economic opportunity they create for Florida is great.

The Economic Impact of the U.S.-Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) on Florida

By Mark Smith
Managing Director, Western Hemisphere Affairs
U.S. Chamber of Commerce

Introduction:

The U.S.-Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) will provide substantial new trade-related economic opportunities for Florida businesses, workers and citizens. Already, the Central American countries and the Dominican Republic together form Florida's largest export market in the world, accounting for \$3.1 billion of exports in 2003. This study draws upon the experiences of the North American Free Trade Agreement (NAFTA) and the recent U.S.-Chile Free Trade Agreement and uses the U.S. Department of Commerce's Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II) to offer a vision of the potential impact of the DR-CAFTA on the Florida economy.

The results:

The findings illustrate the substantial opportunities that DR-CAFTA presents for the state. In the first year, our model shows a potential increase in output across all industries of \$958 million, increased earnings for employees in all industries of \$226 million, and the creation of 6,879 new jobs. Of course, the real impact of the agreement becomes clearer as we look further into the future. In nine years, our model shows a potential increase in output across all industries of \$5.1 billion, increased earnings of employees in all industries of \$1.2 billion, and the creation of 36,308 jobs.

How did we get there?

In order to estimate the potential impact of the DR-CAFTA, the input-output model that we used requires one to make predictions about the increase in output in various industries (for more information on the RIMS II model see pg. 10). In making these predictions, we drew on our experience with NAFTA and the U.S.-Chile FTA. In the first year of NAFTA, total trade with Mexico increased 20% and U.S. exports to Mexico increased 18%. In the first six months after the U.S.-Chile Free Trade Agreement, U.S. exports to Chile increased 25%. We decided to use a conservative 17% figure to calculate the first year impact of the agreement (see pg. 5). For the nine year estimate, we used the same increase in U.S. exports to Mexico between 1994 and 2003: 91% (see pg. 6). These estimates, while based on historical facts and experience, are predictions. The true results could surprise to either the upside or downside, but they allow us to make an educated guess about the economic impact of the agreement.

In terms of job losses due to imports, the DR-CAFTA agreement is much different than the NAFTA or the U.S.-Chile-FTA in that the United States has already "paid the price" of the increased access to our market given to our counterparts through the Caribbean Basin Initiative (CBI), other trade preferences and most-favored nation (MFN) treatment. In 2003, 77% of Central American and Dominican industrial products (including 99% of

non-apparel industrial products) and 99.5% of agricultural products entered our country duty-free. In areas where imports from Central America and the Dominican Republic are not duty-free, the U.S. average tariff is significantly lower than that faced by our exports to these countries. Central American and Dominican Republic average applied industrial tariffs are 30 to 100% higher than U.S. applied industrial rates. Whereas U.S. rates average 3.6%, Guatemala's average applied industrial tariff is 7.1%, Honduras's is 6.7%, El Salvador's is 6.5%, Nicaragua's is 4.9%, Costa Rica's is 4.6% and the Dominican Republic's is 10.7% (2001 figures).

The 23% of industrial imports from Central America and the Dominican Republic that will receive improved access to our market under the agreement are almost exclusively apparel products. In the apparel area, our trade with the DR-CAFTA countries is far from a zero-sum game. During the past twenty years, and especially over the last 36 months, the United States and these six countries have developed an increasingly integrated supply chain and co-production relationship in textiles and apparel. As a result, Central America and the Dominican Republic have emerged as both one of the largest export markets for U.S. cotton growers, yarn spinners, and fabric mills, as well as one of the most important sourcing locations for U.S. apparel and retail companies. During 2003, U.S. fabric and yarn exports to the region stood at \$2.24 billion, or just over 26% of worldwide U.S. fabric and yarn exports. Apparel imports from the region surpassed 3.9 billion square meter equivalents (SMEs), or about 20.8% of all U.S. apparel imports. With the end of the multi-fiber arrangement in January 2005 and the anticipated surge in apparel exports from Asia, the one million textile and apparel workers in the United States, Central America, and the Dominican Republic depend upon each other more than ever to maintain a globally competitive textile and apparel industry in the Western Hemisphere.

While there is additional access in several product areas, the change from the status quo in the import area is minimal. The value of the agreement for Central America and the Dominican Republic is that their existing preferential access to our market would be locked in. Thus, in this study we have not made an effort to estimate potential Florida economic losses due to greater imports.

Conclusion:

The DR-CAFTA presents a substantial opportunity for Florida's elected leaders to make a substantial positive contribution to the state's economic growth, increase worker incomes, and provide new opportunities for those who are seeking work in higher-paying, export-oriented jobs. While the Central American countries and the Dominican Republic are small, the cumulative economic opportunity they create for Florida is great.

Results of the Study

In order to understand the potential of the U.S.-Dominican Republic-Central America Free Trade Agreement (DR-CAFTA), it is important to understand the existing trade relationship. Below, Florida's 2003 exports to Central America and the Dominican Republic are broken down by industry sector.

Export Product	Total 2003 Exports Central America and the Dominican Republic \$1,000s
Crop and animal Production	19,092.00
Forestry, fishing and related activities	6,014.00
Oil and Gas Extraction	43.00
Mining, except oil and gas	6,732.00
Wood product Manufacturing	23,112.00
Nonmetallic mineral product manufacturing	30,584.00
Primary Metal Manufacturing	42,692.00
Fabricated Metal Product Manufacturing	93,534.00
Machinery Manufacturing	263,567.00
Computer & Electronic Product Manufacturing	752,208.00
Electrical Equipment & Appliance Manufacturing	151,489.00
Transportation Equipment (Motor vehicle and other)	214,416.00
Furniture and Related Product Manufacturing	17,812.00
Misc. Manufacturing	118,176.00
Food, beverage and tobacco product Manufacturing	123,277.00
Apparel Manufactures	244,861.00
Non-apparel textile products	550,868.00
Leather and related Products	21,866.00
Paper Products	110,075.00
Printing & Related Products	24,649.00
Petroleum & Coal Products Manufacturing	9,558.00
Chemical Manufacturing	185,731.00
Plastics & Rubber Products Manufacturing	79,634.00
Publishing including software	130.00
Totals	3,090,120.00

Source: U.S. Department of Commerce

Year One:

We calculated the increased final output that a 17% increase in Florida exports to the DR-CAFTA countries would produce and its related ripple effects on output across all industries, on incomes and employment, resulting in the following total: a potential increase in output across all industries of \$958 million, increased earnings of employees in all industries of \$226 million and the creation of 6,879 new jobs.

Export Product	Total 2003 Exports to Central America and the Dominican Republic \$1,000s	Projected Post DR-CAFTA Exports in thousands (17% increase) \$1,000s	Change in Total Output for all industries \$	Change in Earnings for Households Employed By All Industries \$	Change in number of jobs in all industries
Crop and animal Production	19,092.00	3,245.64	5,937,898.38	1,313,510.51	60.89
Forestry, fishing and related activities	6,014.00	1,022.38	2,085,041.77	614,143.67	36.02
Oil and Gas Extraction	43.00	7.31	12,742.06	2,661.57	0.14
Mining, except oil and gas	6,732.00	1,144.44	2,064,798.65	540,290.12	13.84
Wood product Manufacturing	23,112.00	3,929.04	7,347,697.70	1,686,736.87	61.72
Nonmetallic mineral product manufacturing	30,584.00	5,199.28	10,045,008.96	2,406,226.78	73.39
Primary Metal Manufacturing	42,692.00	7,257.64	12,327,827.30	2,725,969.58	79.69
Fabricated Metal Product Manufacturing	93,534.00	15,900.78	27,780,252.74	7,110,828.82	224.85
Machinery Manufacturing	263,567.00	44,806.39	81,865,755.17	20,808,087.52	572.73
Computer & Electronic Product Manufacturing	752,208.00	127,875.36	241,786,730.69	59,577,130.22	1,479.06
Electrical Equipment & Appliance Manufacturing	151,489.00	25,753.13	46,695,575.32	11,220,638.74	346.08
Transportation Equipment (Motor vehicle and other)	214,416.00	36,450.72	62,964,973.73	13,825,758.10	406.30
Furniture and Related Product Manufacturing	17,812.00	3,028.04	5,530,109.45	1,459,818.08	53.91
Misc. Manufacturing	118,176.00	20,089.92	37,427,520.96	10,173,535.49	306.52
Food, beverage and tobacco product Manufacturing	123,277.00	20,957.09	38,990,665.95	7,378,991.39	229.86
Apparel Manufactures	244,861.00	41,626.37	73,761,927.64	17,528,864.41	677.07
Non-apparel textile products	550,868.00	93,647.56	168,088,005.44	39,500,540.81	1,424.98
Leather and related Products	21,866.00	3,717.22	6,586,913.84	1,565,321.34	60.46
Paper Products	110,075.00	18,712.75	33,742,830.80	7,174,468.35	202.90
Printing & Related Products	24,649.00	4,190.33	8,070,994.61	2,281,634.69	75.18
Petroleum & Coal Products Manufacturing	9,558.00	1,624.86	2,975,118.66	694,140.19	16.99
Chemical Manufacturing	185,731.00	31,574.27	59,195,441.40	11,616,173.93	302.86
Plastics & Rubber Products Manufacturing	79,634.00	13,537.78	23,630,194.99	5,538,305.80	174.45
Publishing including software	130.00	22.10	245,219.00	12,835.68	0.35
Totals	3,090,120.00	525,320.40	958,914,026.21	226,743,776.98	6,879

Source: Input-output model, U.S. Department of Commerce

Year Nine:

Next, we calculated the increased final output that a 91% increase in Florida exports to the DR-CAFTA countries would produce and its related ripple effects on output across all industries, on incomes and employment, resulting in the following total: a potential increase in output across all industries of \$5.1 billion, increased earnings of employees in all industries of \$1.2 billion and the creation of 36,308 jobs.

Export Product	Total 2003 Exports to Central America and the Dominican Republic \$1,000s	Projected Additional Exports in Year Nine (91% increase) \$1,000	Projected Change in Total Output for All Industries in Year Nine	Change in Earnings for Households Employed By All Industries in Year Nine	Projected Change in Jobs in All Industries by Year Nine
Crop and animal Production	\$ 19,092.00	\$17,373.72	\$ 31,785,220.74	\$ 7,031,144.48	325.9362
Forestry, fishing and related activities	\$ 6,014.00	\$5,472.74	\$ 11,161,105.96	\$ 3,287,474.92	192.80846
Oil and Gas Extraction	\$ 43.00	\$39.13	\$ 68,207.50	\$ 14,247.23	0.7231576
Mining, except oil and gas	\$ 6,732.00	\$6,126.12	\$ 11,052,745.70	\$ 2,892,141.25	74.107674
Wood product Manufacturing	\$ 23,112.00	\$21,031.92	\$ 39,331,793.59	\$ 9,029,003.26	330.37781
Nonmetallic mineral product manufacturing	\$ 30,584.00	\$27,831.44	\$ 53,770,342.08	\$ 12,880,390.43	392.86861
Primary Metal Manufacturing	\$ 42,692.00	\$38,849.72	\$ 65,990,134.39	\$ 14,591,954.83	426.5777
Fabricated Metal Product Manufacturing	\$ 93,534.00	\$85,115.94	\$ 148,706,058.77	\$ 38,063,848.37	1203.6245
Machinery Manufacturing	\$ 263,567.00	\$239,845.97	\$ 438,222,571.79	\$ 111,384,468.47	3065.8071
Computer & Electronic Product Manufacturing	\$ 752,208.00	\$684,509.28	\$ 1,294,270,146.62	\$ 318,912,873.55	7917.3081
Electrical Equipment & Appliance Manufacturing	\$ 151,489.00	\$137,854.99	\$ 249,958,667.87	\$ 60,063,419.14	1852.5505
Transportation Equipment (Motor vehicle and other)	\$ 214,416.00	\$195,118.56	\$ 337,047,800.54	\$ 74,008,469.81	2174.889
Furniture and Related Product Manufacturing	\$ 17,812.00	\$16,208.92	\$ 29,602,350.60	\$ 7,814,320.33	288.55281
Misc. Manufacturing	\$ 118,176.00	\$107,540.16	\$ 200,347,318.08	\$ 54,458,337.02	1640.7832
Food, beverage and tobacco product Manufacturing	\$ 123,277.00	\$112,182.07	\$ 208,714,741.24	\$ 39,499,306.85	1230.4017
Apparel Manufactures	\$ 244,861.00	\$222,823.51	\$ 394,843,259.72	\$ 93,830,980.06	3624.3135
Non-apparel textile products	\$ 550,868.00	\$501,289.88	\$ 899,765,205.61	\$ 211,444,071.38	7627.8273

Leather and related Products	\$ 21,866.00	\$19,898.06	\$ 35,259,362.32	\$ 8,379,073.07	323.64991
Paper Products	\$ 110,075.00	\$100,168.25	\$ 180,623,388.40	\$ 38,404,507.05	1086.1344
Printing & Related Products	\$ 24,649.00	\$22,430.59	\$ 43,203,559.40	\$ 12,213,456.26	402.42946
Petroleum & Coal Products Manufacturing	\$ 9,558.00	\$8,697.78	\$ 15,925,635.18	\$ 3,715,691.62	90.93616
Chemical Manufacturing	\$ 185,731.00	\$169,015.21	\$ 316,869,715.71	\$ 62,180,695.76	1621.177
Plastics & Rubber Products Manufacturing	\$ 79,634.00	\$72,466.94	\$ 126,491,043.77	\$ 29,646,225.15	933.84522
Publishing including software	\$ 130.00	\$118.30	\$ 223,149.29	\$ 68,708.64	1.8903749
Totals	\$ 3,090,120.00	\$2,812,009.20	\$ 5,133,010,375.58	\$ 1,213,746,100.29	36,308

Source: Input-output model, U.S. Department of Commerce

Economic Impact on Tampa Metro Area and Western Florida:

In order to help provide some insights into the impact of the DR-CAFTA agreement on the Tampa metropolitan area and West Central Florida, we took a look at the current amount of trade through the Port of Tampa to the DR-CAFTA countries. The Tampa Port Authority is the largest economic engine in West Central Florida, impacting 108,000 jobs in a seven county area and generating an annual \$13 billion economic impact on the region. In 2003, total trade with the DR-CAFTA countries reached 461,000 tons (of that figure or 372,000 are exports). Based on the same assumptions underpinning our state-wide economic analysis (17% growth in year one and 91% in year nine), exports to the DR-CAFTA countries could grow to 436,000 tons the year after implementation of the agreement and 712,000 tons nine years out. We've also provided some information on the Tampa area businesses that would benefit most from the agreement. Companies like Angel Auto Sales and Tropical Sports Wear who sell \$10 and \$7 million to the region, respectively, should see a tremendous benefit from the agreement, as well as farmers in the poultry sector and suppliers of fishing nets. Clearly, given the tremendous economic impact that port traffic has on the city of Tampa and its surroundings, we anticipate a significant positive impact for area businesses, employee salaries and employment.

**Port of Tampa Trade with DR-CAFTA Countries
Fiscal Year 2003**

Country	Commodity	Imports (net tons)	Exports (net tons)	Total (net tons)
Costa Rica	Containerized	1,122	718	1,840
	Commodities NOS	51	212	263
	Concentrate, Citrus, Bulk	16,685	596	17,281
	Construction equipment	-	9	9
	Fertilizer, bagged	-	322	322
	Machinery	22	78	100
	Paper/Paper Products	17	-	17
	Phosphatic Chemical, bulk	-	73,875	73,875
	Steel, Misc.	-	4	4
	Steel, Pipe	-	1	1
	Steel, Plates/Sheets	-	29	29
	Tractors	-	35	35
	Trailers	-	143	143
	Vehicles	1	7,144	7,145
	Yahts and Boats	-	7	7
Total Costa Rica		17,898	83,173	101,071
Dominican Republic	Phosphatic Chemical, Bulk	-	99,959	99,959
	Tallow, Bulk	-	11,942	11,942
	Trailers, Other	173	173	346
Total Dominican Republic		173	112,074	112,247
El Salvador	Phosphatic Chemical, Bulk	-	26,786	26,786
	Vehicles	-	239	239
Total El Salvador		-	27,025	27,025
Guatemala	Commodities NOS	1	395	396
	Containerized	66	4,010	4,076
	Fruit, Melons	44,650	-	44,650
	Insect/Fungicides, Pkgd	-	59	59
	Lube Oil, Pkgd.	-	22	22
	Lumber, NOS	74	-	74
	Lumber, Pine	99	-	99
	Lumber, Tomato Stakes	145	-	145
	Machinery	-	21	21
	Paper/Paper Products	-	3,568	3,568
	Phosphatic Chemical, Bulk	-	69,012	69,012

	Slag	5,817	-	5,817
	Steel, Misc.	-	18	18
	Steel, Pipe	454	1	455
	Steel, Plates/Sheets	-	431	431
	Tractors	-	7	7
	Trailers	-	3	3
	Vegetables, Fresh	3	-	3
	Vehicles	2	8,197	8,197
	Yachts and Boats	-	2	2
Total Guatemala		51,311	85,746	137,057
Honduras	Commodities NOS	355	923	1,278
	Containerized	1,264	3,933	5,197
	Lumber, NOS	12	-	12
	Lumber, Pine	1,199	-	1,199
	Lumber, Tomato Stakes	15,775	-	15,775
	Petroleum Products	-	3,234	3,234
	Phosphatic Chemical, Bulk	-	44,940	44,940
	Seafood, Fresh	540	-	540
	Tallow, Bulk	-	1,544	1,544
	Vehicles	165	2,847	3,012
Total Honduras		19,310	57,421	76,731
Nicaragua	Phosphatic Chemical, Bulk	-	7,526	7,526
Total Nicaragua		-	7,526	7,526
DR-CAFTA Total		88,692	372,965	461,657

Source: Port of Tampa authority

Expected Increase in Exports from Port of Tampa to DR-CAFTA countries

Country	2003 Total Exports (net tons)	Total Projected 1 st year with 17% increase (net tons)	Total Projected after 9 years with 91% increase (net tons)
Costa Rica	83,173	97,312	158,860
Dominican Republic	112,074	131,127	214,061
El Salvador	27,025	31,619	51,618
Guatemala	85,746	100,323	163,775
Honduras	57,421	67,183	109,674
Nicaragua	7,526	8,805	14,375
DR-CAFTA Total	372,965	436,369	712,363

Source: Tampa Port Authority, author

**11th District of Florida
The Honorable Jim Davis**

Trade with Central America, 2003

Leading 11th District Exporters to Central America

Exporter	Value (\$)
Angel Auto Sales	10,014,955
Tropical Sportswear	7,457,114
Copher Equities	6,631,652
Ball	4,705,672
Tampa Tank and Welding	4,504,600
Best Car Exports and Shipping	2,596,471
Cargill, Inc.	2,541,706

Leading Products Exported to Central America from the 11th District

Product Description	Value (\$)
Fresh, Frozen or Chilled Poultry Meat and Offal	57,037
Fishing Nets	7,554
Epoxide Resins	2,724
Electromechanical Food Grinder, Processor, Mixer	555
Fans	491

Regional Multipliers from the Regional Input-Output Modeling System (RIMS II): A Brief Description

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

Overview

Effective planning for public- and private-sector projects and programs at the State and local levels requires a systematic analysis of the economic impacts of these projects and programs on affected regions. In turn, systematic analysis of economic impacts must account for the interindustry relationships within regions because these relationships largely determine how regional economies are likely to respond to project and program changes. Thus, regional input-output (I-O) multipliers, which account for interindustry relationships within regions, are useful tools for conducting regional economic impact analysis.

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for estimating regional I-O multipliers known as RIMS (Regional Industrial Multiplier System), which was based on the work of Garnick and Drake. ^{1/} In the 1980's, BEA completed an enhancement of RIMS, known as RIMS II (Regional Input-Output Modeling System), and published a handbook for RIMS II users. ^{2/} In 1992, BEA published a second edition of the handbook in which the multipliers were based on more recent data and improved methodology. In 1997, BEA published a third edition of the handbook that provides more detail on the use of the multipliers and the data sources and methods for estimating them.

RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the industrial distribution of inputs purchased and outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table ([pdf](#)) ([html](#)), which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to show a region's industrial structure and trading patterns. ^{3/}

Using RIMS II for impact analysis has several advantages. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry, or group of industries, in the national I-O table. The accessibility of the main data sources for RIMS II keeps the cost of estimating regional multipliers relatively low. Empirical tests show that estimates based on relatively expensive surveys and RIMS II-based estimates are similar in magnitude. ^{4/}

BEA's RIMS multipliers can be a cost-effective way for analysts to estimate the economic impacts of changes in a regional economy. However, it is important to keep in mind that, like all economic impact models, RIMS provides approximate order-of-magnitude estimates of impacts. RIMS multipliers are best suited for estimating the impacts of small changes on a regional economy. For some applications, users may want to supplement RIMS estimates with information they gather from the region undergoing the potential change. Examples of case studies where it is appropriate to use RIMS multipliers appear in the RIMS II User Handbook.

To effectively use the multipliers for impact analysis, users must provide geographically and industrially detailed information on the initial changes in output, earnings, or employment that are associated with the project or program under study. The multipliers can then be used to estimate the total impact of the project or program on regional output, earnings, and employment.

RIMS II is widely used in both the public and private sector. In the public sector, for example, the Department of Defense uses RIMS II to estimate the regional impacts of military base closings. State transportation departments use RIMS II to estimate the regional impacts of airport construction and expansion. In the private-sector, analysts and consultants use RIMS II to estimate the regional impacts of a variety of projects, such as the development of shopping malls and sports stadiums.

RIMS II Methodology

RIMS II uses BEA's 1997 benchmark I-O table for the nation, which shows the input and output structure for approximately 500 industries. Since a particular region may not contain all the industries found at the national level, some direct input requirements cannot be supplied by that region's industries. Input requirements that are not produced in a study region are identified using BEA's regional economic accounts. Currently, data for 2001 are used.

The RIMS II method for estimating regional I-O multipliers can be viewed as a three-step process. In the first step, the producer portion of the national I-O table is made region-specific by using six-digit NAICS location quotients (LQ's). The LQ's estimate the extent to which input requirements are supplied by firms within the region. RIMS II uses LQ's based on two types of data: BEA's personal income data (by place of residence) are used to calculate LQ's in the service industries; and BEA's wage-and-salary data (by place of work) are used to calculate LQ's in the nonservice industries.

In the second step, the household row and the household column from the national I-O table are made region-specific. The household row coefficients, which are derived from the value-added row of the national I-O table, are adjusted to reflect regional earnings leakages resulting from individuals working in the region but residing outside the region. The household column coefficients, which are based on the personal consumption expenditure column of the national I-O table, are adjusted to account for regional consumption leakages stemming from personal taxes and savings.

In the last step, the Leontief inversion approach is used to estimate multipliers. This inversion approach produces output, earnings, and employment multipliers, which can be used to trace the impacts of changes in final demand on directly and indirectly affected industries.

Accuracy of RIMS II

Empirical tests indicate that RIMS II yields multipliers that are not substantially different in magnitude from those generated by regional I-O models based on relatively expensive surveys. For example, a comparison of 224 industry-specific multipliers from survey-based tables for Florida, Washington, and West Virginia indicates that the RIMS II average multipliers overestimate the average multipliers from the survey-based tables by approximately 5%. For the majority of individual industry-specific multipliers, the difference between RIMS II and survey-based multipliers is less than 10%. In addition, RIMS II and survey multipliers show statistically similar distributions of affected industries.

Advantages of RIMS II

There are numerous advantages to using RIMS II. First, the accessibility of the main data sources makes it possible to estimate regional multipliers without conducting relatively expensive surveys. Second, the level of industrial detail used in RIMS II helps avoid aggregation errors, which often occur when industries are combined. Third, RIMS II multipliers can be compared across areas because they are based on a consistent set of estimating procedures nationwide. Fourth, RIMS II multipliers are updated to reflect the most recent local-area wage-and-salary and personal income data.

Applications of RIMS II

RIMS II multipliers can be used in a wide variety of impact studies. For example, the U.S. Nuclear Regulatory Commission has used RIMS II multipliers in environmental impact statements required for licensing nuclear electricity-generating facilities. The U.S. Department of Housing and Urban Development has used RIMS II multipliers to estimate the impacts of various types of urban redevelopment expenditures. In addition, BEA has provided RIMS II multipliers to numerous individuals and groups outside the Federal Government. RIMS II multipliers have been used to estimate the regional economic and industrial impacts of the following: opening or closing military bases, hypothetical nuclear reactor accidents, tourist expenditures, new energy facilities, energy conservation, offshore drilling, opening or closing manufacturing plants, shopping malls, new sports stadiums, and new airport or port facilities.

1. See Daniel H. Garnick, "Differential Regional Multiplier Models," *Journal of Regional Science* 10 (February 1970): 35-47; and Ronald L. Drake, "A Short-Cut to Estimates of Regional Input-Output Multipliers," *International Regional Science Review* 1 (Fall 1976): 1-17.

2. See U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Input-Output Modeling System (RIMS II): Estimation, Evaluation, and Application of a Disaggregated Regional Impact Model* (Washington, DC: U.S. Government Printing Office, 1981). Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; order no. PB-82-168-865; price \$26.

3. See U.S. Department of Commerce, Bureau of Economic Analysis, *The Detailed Input-Output Structure of the U.S. Economy, Volume II* (Washington, DC: U.S. Government Printing Office, November 1994); and U.S. Department of Commerce, Bureau of Economic Analysis, *State Personal Income, 1929-93* (Washington, DC: U.S. Government Printing Office, June 1995).

4. See U.S. Department of Commerce, *Regional Input-Output Modeling System (RIMS II)*, chapter 5. Also see Sharon M. Brucker, Steven E. Hastings, and William R. Latham III, "The Variation of Estimated Impacts from Five Regional Input-Output Models," *International Regional Science Review* 13 (1990): 119-39.