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# The medical products industry cluster in Tampa Bay and Florida : an analysis performed by Center for Economic Development Research, College of Business Administration, University of South Florida

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# **The Medical Products Industry Cluster in Tampa Bay and Florida**

An Analysis Performed by

CENTER FOR ECONOMIC DEVELOPMENT RESEARCH  
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## *Preface*

*This study was commissioned by the Florida Medical Manufacturers Consortium and performed by the Center for Economic Development Research, College of Business Administration, University of South Florida. The purpose of the study is to describe the extent of clustering and quantify the economic impacts of the Medical Products Industry Group in Tampa Bay and Florida. The Center for Economic Development Research provides information and conducts research on issues related to economic growth and development in the Nation, in the state of Florida, and particularly in the central Florida region. The Center serves the faculty, staff, and students of the College of Business Administration, the University, and individuals and organizations in the Tampa Bay region and statewide. Activities of the Center for Economic Development Research are designed to further the objectives of the University and specifically the objectives of the College of Business Administration.*

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## EXECUTIVE SUMMARY

The purpose of this research is to describe the extent of clustering of the medical manufacturing and associated industries in Tampa Bay and Florida. The Medical Products Industry Group consists of three segments: the Pharmaceutical Segment, the Biotech Segment, and the Medical Devices Segment. We determine the industries that combine with the group to form the Medical Products Industry Cluster. We determine the direct economic effects, or baseline contributions, of the industries in the Medical Products Industry Group in Tampa Bay and Florida. We also review the data to ascertain the quality and number of direct jobs in the Medical Products Industry Group. Finally, we estimate the economic contribution of the Medical Products Industry Cluster in Tampa Bay and Florida.

To analyze the extent of clustering of the Medical Products Industry Group, we observe whether the component industries in the group have similar supplier-industries. For the Medical Products Industry Group in Tampa Bay, Wholesale Trade exhibits the greatest supplier relationship to the group, followed by a number of service oriented supplier-industries. And, some of the primary industries provide inputs for other primary industries in the Medical Products Industry Group. Similar results are noticed in the analysis of Florida statewide, with some variation in the rankings and minimal substitution of individual supplier-industries. In general, the similarity of supplier-industries between the various primary industries leads us to conclude that the Medical Products Industry Group functions as an economic cluster.

Baseline contributions refer to the measures of output, employment, and labor income in the Medical Products Industry Group. We used the *IMPLAN™ Professional* software to determine the levels of each measure in Tampa Bay and Florida in 2004, which is the latest year we have data available from IMPLAN.

Baseline Contributions, Tampa Bay			
<u>Segment</u>	<u>Employment</u>	<u>Output</u> <u>(Millions 2004\$)</u>	<u>Labor Income</u> <u>(Millions 2004\$)</u>
Pharmaceutical	1,073	841.92	69.16
Biotech	2,684	241.73	137.09
Medical Devices	<u>8,712</u>	<u>2,388.54</u>	<u>683.17</u>
Total	12,469	3,472.19	889.42

In Tampa Bay, baseline industry output measured almost \$3.5 billion. Of this amount, more than two-thirds was produced by the Medical Devices Segment. There were nearly 12,500 baseline employees in the Medical Products Industry Group. These employees earned labor income of over \$889 million. These measures were heavily weighted in the Medical Devices Segment. Baseline contribution measures in Florida followed a similar pattern to Tampa Bay, except on an order of magnitude of about 3 to 4 times the levels in Tampa Bay.

Baseline Contributions, Florida

<u>Segment</u>	<u>Employment</u>	<u>Output</u> <u>(Millions 2004\$)</u>	<u>Labor Income</u> <u>(Millions 2004\$)</u>
Pharmaceutical	4,149	3,327.18	296.62
Biotech	18,045	1,883.68	1,184.99
Medical Devices	<u>26,398</u>	<u>6,997.77</u>	<u>2,045.91</u>
Total	48,592	12,208.63	3,527.52

Baseline output in the Medical Products Industry Group was over \$12.2 billion. Baseline employment totaled almost 48,600 workers, who earned more than \$3.5 billion in labor income. The baseline contribution amounts in Florida measured by output were composed of about 60% in the Medical Devices Segment, 25% in the Pharmaceutical Segment, and 15% in the Biotech Segment.

We used the State of Florida Unemployment Insurance data to ascertain the number of jobs in the Medical Products Industry Group. The latest annualized data available is for 2005.

Tampa Bay Unemployment Insurance Data

<u>Segment</u>	<u>Firms</u>	<u>Covered Jobs</u>	<u>Jobs paying &lt;\$36k</u>	<u>Jobs paying &gt;\$36k</u>
Pharmaceutical	23	1,171	18	1,153
Biotech	146	1,720	3	1,717
Medical Devices	<u>119</u>	<u>7,048</u>	<u>1,080</u>	<u>5,968</u>
Total	288	9,939	1,101	8,838

Florida Unemployment Insurance Data

<u>Segment</u>	<u>Firms</u>	<u>Covered Jobs</u>	<u>Average Wage</u>
Pharmaceutical	94	4,141	\$55,416
Biotech	779	10,741	\$69,845
Medical Devices	<u>522</u>	<u>25,434</u>	<u>\$49,390</u>
Total	1,395	40,316	\$55,458

In 2005, there were 288 firms in Tampa Bay and 1,395 in Florida that were a part of the Medical Products Industry Group. In Tampa Bay, these firms employed 9,939 workers, almost 90% of which were paid more than the statewide average wage. Over 70% of the Medical Products Industry Group employment in Tampa Bay was in the Medical Devices Segment. In Florida, there were more than 40,000 workers employed in the Medical Products Industry Group. Of these, about 65% were employed in the Medical Devices Segment, 25% were in the Biotech Segment, and 10% in the Pharmaceutical Segment. Average wages were highest in the Biotech Segment, and closely followed by the Pharmaceutical Segment. On average, wages of \$55,458 throughout the Medical Products Industry Group in Florida were significantly higher than the statewide average wage of just over \$36,000.

We also estimate the economic contribution of the Medical Products Industry Cluster to Tampa Bay and Florida in 2004. The economic stimulus is the existence of jobs in the Medical Products Industry Group. When we virtually remove these jobs, including the value of the output they produce and the income earned by their employees, a ripple effect occurs throughout the economy. The indirect effect is the impact to supplier-industries while the induced effect results from the loss of consumer spending by the displaced workers. We report this total economic contribution in terms of output, employment, and labor income.

Economic Contributions, Tampa Bay

<u>Segment</u>	<u>Employment</u>	<u>Output</u> <u>(Millions 2004\$)</u>	<u>Labor Income</u> <u>(Millions 2004\$)</u>
Pharmaceutical	5,752	1,486.87	263.42
Biotech	5,280	507.01	227.16
Medical Devices	<u>25,957</u>	<u>4,411.21</u>	<u>1,359.56</u>
Total	36,989	6,405.09	1,850.15

Economic Contributions, Florida

<u>Segment</u>	<u>Employment</u>	<u>Output</u> <u>(Millions 2004\$)</u>	<u>Labor Income</u> <u>(Millions 2004\$)</u>
Pharmaceutical	22,136	5,832.86	1,068.33
Biotech	37,932	3,931.44	1,880.67
Medical Devices	<u>75,386</u>	<u>12,834.37</u>	<u>4,011.78</u>
Total	135,454	22,598.67	6,960.78

In 2004, the number of jobs provided by firms associated with the Medical Product Industry Cluster was almost 37,000 in Tampa Bay and over 135,000 in Florida. This is a multiple of almost three times the number of direct jobs in the Medical Products Industry Group. The labor income earned by workers in these jobs exceeded \$1.85 billion in Tampa Bay and more than \$6.96 billion in Florida. Workers in these jobs produced output valued at more than \$6.4 billion in Tampa Bay and nearly \$22.6 billion in Florida.

As the effects of the economic activity of the Medical Products Industry Group ripple through the economy, there is added economic activity. The total economic contribution, in terms of the value of the output produced, is over 2.8% of the value of all economic activity in Tampa Bay. In Florida, output in the cluster represents more than 2.2% of total economic activity. The Medical Product Industry Cluster represents a substantial contribution to the diverse economy of the Tampa Bay region and to Florida. The economic contributions are both growing and sustainable. In terms of business life cycle, the economic contribution is characteristic of an industry in the early stages of maturation, one which has not yet reached its peak and which has significant room for further growth.

## I. Introduction.

The purpose of this research is to analyze the extent of clustering and to estimate the economic impacts of the Medical Products Industry to Tampa Bay and Florida. We define Tampa Bay as the seven-county region which includes: Hernando, Hillsborough, Manatee, Pasco, Pinellas, Polk, and Sarasota counties. Additionally, we report on the level of employment and average wages in the various industry segments of the Medical Products Industry Group. We begin with an Operational Definition of the Medical Products Industry Group in **Section II**. The definition is derived from an analysis of potential primary industries. We chose the primary industries after discussions with industry representatives, officials with Pinellas County Economic Development and economic development experts at the Tampa Bay Partnership. We used the North American Industry Classification System (NAICS) descriptions of each potential primary industry to compare with industry groupings formulated by others and to confirm the applicability of each potential primary industry for inclusion in the analysis.<sup>1</sup> We then used this industry code to model an economic impact in each primary industry and rank the supplier-industries in Tampa Bay and Florida. We judge these supplier-industry rankings to determine if there are geographic concentrations of these industries.

Next, we describe the Baseline Contributions of the Primary Industries of the Medical Products Industry Group in Tampa Bay and Florida. **Section III** presents the results of analysis of these baseline contributions, and sets up the basis for developing the analysis of economic contribution.

In **Section IV**, we describe the quality of jobs found in the Medical Products Industry Group. The number of jobs and average wage in each sector are identified from the Florida Unemployment Insurance data provided by firms to the state. The average wage is an indication of the quality of jobs in the primary sectors.

We analyze the economic contributions of the Medical Products Industry Cluster in **Section V**. In this analysis, we virtually remove all baseline contributions from the economy. This virtual elimination of the industry activity results in a ripple effect throughout the economy, and produces the total economic contribution of the cluster. Economic contribution analysis includes a direct effect as well as an indirect effect and an induced effect. When jobs are created in an industry, these jobs motivate the creation of additional jobs in related industries. This phenomenon of job creation, with concomitant increased levels of income, production, and consumer spending, is called the multiplier or ripple effect. For this analysis, we estimate the phenomenon of *economic contribution*, as it ripples through the economy, using the *IMPLAN<sup>TM</sup> Professional* regional economic input-output model. We describe the model in **Appendix A**.

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<sup>1</sup> The North American Industry Classification System (NAICS) groups establishments into industries based on the activities in which they are primarily engaged. The system uses a hierarchical structure that progresses from individual industries (5-digit) to industry groups (4-digit) to industry subsectors (3-digit) to industry sectors (2-digit).



## II. An Operational Definition of the Medical Products Industry Cluster in Tampa Bay and Florida.

The purpose of this section is to develop an understanding of the functional characteristics of firms in industries associated with medical products in Tampa Bay and Florida.

Harvard economist, Michael Porter, in *The Competitive Advantage of Nations* (1990) and in *On Competition* (1998), develops a model in which competitive advantages are generated by the spatial concentration of firms in an industry as they interact with regional and national factors conducive to their profitability. As applied to a regional economy, Porter's model relates the growth of a regional industry to regional infrastructure, the spatial proximity of upstream industries that supply inputs into the production process, and to the proximity of downstream customers who purchase the industries products and services.<sup>2</sup> Porter calls the grouping of firms, along with their upstream suppliers and downstream customers, an industry cluster.

In order to develop a picture of the Medical Products Industry Cluster in Tampa Bay and Florida, we start with selected **primary industries** and use the *IMPLAN Professional*<sup>TM</sup> input-output model (based on 2004 data, the latest version available at the time we performed this study) to identify the supplier chains (indirect industries) for the primary industries. The selected primary industries are listed by NAICS code and their corresponding IMPLAN sector number. We selected these primary industries in consultation with industry professionals, officials with Pinellas County Economic Development and economic development experts at the Tampa Bay Partnership. We call the consolidation of primary industries the Medical Products Industry Group. The Medical Products Industry Group has three segments as shown in **Table 1**.

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<sup>2</sup> Porter represents regional competitive advantage as a "diamond," the four corners of which are made up of the competitive nature of the industry, the interaction of firms in the industry with suppliers, the interaction of informed domestic customers, and the traditional country-specific factor cost and supply conditions.

Table 1

Medical Products Industry Group

2002 NAICS	2002 NAICS Description	IMPLAN Sector	IMPLAN Description
<b>PHARMACEUTICAL SEGMENT</b>			
32541	Pharmaceutical and Medicine Manufacturing	160	Pharmaceutical and Medicine Manufacturing
325411	Medicinal and Botanical Manufacturing		in IMPLAN 160
325412	Pharmaceutical Preparation Manufacturing		in IMPLAN 160
325413	In-Vitro Diagnostic Substance Manufacturing		in IMPLAN 160
325414	Biological Product (except Diagnostic) Manufacturing		in IMPLAN 160
<b>BIOTECH SEGMENT</b>			
5417	Scientific Research and Development Services	446	Scientific Research and Development Services
54171	Research and Development in the Physical, Engineering, and Life Sciences		in IMPLAN 446
54172	Research and Development in the Social Sciences and Humanities		in IMPLAN 446
<b>MEDICAL DEVICES SEGMENT</b>			
32629	Other Rubber Product Manufacturing	181	Other Rubber Product Manufacturing
326291	Rubber Product Manufacturing for Mechanical Use		in IMPLAN 181
326299	All Other Rubber Product Manufacturing		in IMPLAN 181
333314	Optical Instrument and Lens Manufacturing	271	Optical Instrument and Lens Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	313	Electromedical Apparatus Manufacturing
334514	Totalizing Fluid Meter and Counting Device Manufacturing	317	Totalizing Fluid Meters and Counting Devices
334516	Analytical Laboratory Instrument Manufacturing	319	Analytical Laboratory Instrument Manufacturing
339111	Laboratory Apparatus and Furniture Manufacturing	374	Lab Apparatus and Furniture Manufacturing
339112	Surgical and Medical Instrument Manufacturing	375	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing	376	Surgical Appliance and Supplies Manufacturing
339114	Dental Equipment and Supplies Manufacturing	377	Dental Equipment and Supplies Manufacturing
339115	Ophthalmic Goods Manufacturing	378	Ophthalmic Goods Manufacturing
339991	Gasket, Packing, and Sealing Device Manufacturing	385	Gasket, Packing, and Sealing Device Manufacturing

The primary industries in Table 1 provide a basis for measuring the “magnitude of clustering” within the Medical Products Industry Group.<sup>3</sup> We introduce into the model a theoretical \$100 million increase in the output of each primary industry. We then measure the consequent increase (as a percent of the increased primary output) in other regional industries. The greater the percentage, the more economic activity there is between an indirect industry and the primary industries. To better organize the inter-industry relationships, we use three tiers. Tier 1 relationships occur when an indirect industry’s

<sup>3</sup> See the previous study, *Medical Product Industries Cluster in Tampa Bay*, prepared by CEDR in October, 2002 which determined the clustering effects of excluding Research and Development were essentially similar to the clustering effects of including Research and Development in the analysis. IMPLAN sectors 181 and 446 include two industries that are not part of the Medical Products Industry Group. IMPLAN sector 181 includes NAICS 326291 (Rubber Product Manufacturing for Mechanical Use), and IMPLAN sector 446 includes NAICS 54172 (Research and Development in Social Sciences and Humanities). Because we cannot measure the “magnitude of clustering” for NAICS 326299 and 54171 separately from other industries in each respective IMPLAN sector scheme, we examine the clustering effect with these IMPLAN sectors included.

output increases by more than 1% of the increase in primary output. A tier 2 relationship is between 0.5% and 1%. Tier 3 relationships are less than 0.5% of the increase in primary output. In **Appendix B**, we present more details about the inter-industry relationships for each primary industry and the average of all industries in Tampa Bay. **Appendix C** contains more details about the inter-industry relationships for each primary industry and the average of all industries in Florida statewide.

**Tables 2 and 3** present the frequency tables for Tier 1 supplier-industries in Tampa Bay and Florida, respectively.

Table 2 is a frequency table for Tier 1 supplier-industries in Tampa Bay when all IMPLAN sectors are considered. The maximum frequency a supplier-industry can attain is 14. The results indicate that there are 29 Tier 1 supplier-industries in the Medical Products Industry Group in Tampa Bay. Wholesale Trade is foremost of the Tier 1 supplier-industries in Tampa Bay, suggesting a source outside the region for a significant amount of raw products used in production by firms in the Medical Products Industry Group. A number of service-type industries closely follow Wholesale Trade in the Tier 1 supplier-industries. And, a few logistic-related industries such as real estate and transportation are significant suppliers in Tampa Bay, as well as manufacturing industries directly related to, or a part of, the Medical Products Industry Group.

Table 2 shows three of the primary industries (Biotech, Optical Instrument and Lens Manufacturing, and Electromedical Apparatus Manufacturing) have more than 10 Tier 1 supplier-industries located in Tampa Bay. This means that there is a high concentration of supplier-industries for these primary industries in Tampa Bay. Several of the primary industries have 7 to 9 Tier 1 supplier-industries in Tampa Bay. Only three primary industries have 6 or fewer Tier 1 supplier-industries in Tampa Bay.

Similar to the supplier-industries analysis for Tampa Bay, we prepared a frequency table for Tier 1 supplier-industries in Florida. Table 3 is a frequency table for Tier 1 supplier-industries in Florida. The maximum frequency a supplier-industry can attain is 14. The results are 30 Tier 1 supplier-industries closely associated with the Medical Products Industry Group in Florida. The differences in supplier-industries between Tampa Bay and Florida are minor. The frequency rank-order of a few supplier-industries statewide shifts slightly from one region to the other. There are two Tier 1 supplier-industries in Tampa Bay, IMPLAN sector 177 (Plastics, plumbing fixtures, and other plastics) and 458 (Services to buildings and dwellings) that are not Tier 1 supplier-industries in Florida. In their place, IMPLAN sector 311 (Semiconductors and related device manufacturing), 23 (Gold, silver, and other metal ore mining), and 169 (Custom compounding and purchased resins) are Tier 1 supplier-industries in Florida that are not in Tampa Bay.

Also similar to the results shown for Tampa Bay, Table 3 indicates four of the primary industries have 10 Tier 1 supplier-industries in the state. And, four of the primary industries have 6 or fewer Tier 1 supplier-industries in the state.

Table 2

Tampa Bay  
Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	Implan Sector	Description	Total Frequency	Pharmaceutical IMPLAN 160 NAICS 32541 Pharmaceutical and Medicine Manufacturing	Biotech IMPLAN 446 NAICS 5417 Scientific Research and Development Services	Medical Devices IMPLAN 271 NAICS 33314 Optical Instrument and Lens Manufacturing	IMPLAN 181 NAICS 32629 Other Rubber Product Manufacturing	IMPLAN 313 NAICS 334510 Electromedical Apparatus Manufacturing
42	390	Wholesale trade	14	1	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1	1
531	431	Real estate	12	1	1	1	1	1
5133	422	Telecommunications	8	1	1	1	1	1
5411	437	Legal services	7	1	1	1	1	1
33411	302	Electronic computer manufacturing	5			1	1	1
5413	439	Architectural and engineering services	5		1		1	1
2211	30	Power generation and supply	4		1		1	1
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3					1
326191, 326199	177	Plastics plumbing fixtures and all other plastics	2				1	1
334510	313	Electromedical apparatus manufacturing	2					1
339112	375	Surgical and medical instrument manufacturing	2					1
339113	376	Surgical appliance and supplies manufacturing	2					1
484	394	Truck transportation	2				1	
5614	455	Business support services	2					
32541	160	Pharmaceutical and medicine manufacturing	1	1				
327211, 327212, 327215	190	Glass and glass products- except glass containers	1					1
333319	273	Other commercial and service industry machinery ma	1					1
33791	372	Mattress manufacturing	1					
339111	374	Laboratory apparatus and furniture manufacturing	1					
339115	378	Ophthalmic goods manufacturing	1					
339116	379	Dental laboratories	1					
522	436	Lessors of nonfinancial intangible assets	1	1				
5412	438	Accounting and bookkeeping services	1					1
54161	444	Management consulting services	1		1			
5611	452	Office administrative services	1		1			
5613	454	Employment services	1		1			
5617	458	Services to buildings and dwellings	1		1			
			110	7	11		6	10

Table 2 (continued)

Tampa Bay  
Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	IMPLAN Sector	Description	Total Frequency	IMPLAN 317 NAICS 334514 Totalizing Fluid Meters and Counting Devices	IMPLAN 319 NAICS 334516 Analytical Laboratory Instrument Manufacturing	IMPLAN 374 NAICS 339111 Laboratory Apparatus and Furniture Manufacturing	IMPLAN 375 NAICS 339112 Surgical and Medical Instrument Manufacturing
42	390	Wholesale trade	14	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1
531	431	Real estate	12	1	1	1	1
5133	422	Telecommunications	8	1	1	1	1
5411	437	Legal services	7				1
334111	302	Electronic computer manufacturing	5	1	1		
5413	439	Architectural and engineering services	5	1	1		
2211	30	Power generation and supply	4				
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3	1	1		
326191, 326199	177	Plastics plumbing fixtures and all other plastics	2				
334510	313	Electromedical apparatus manufacturing	2				1
339112	375	Surgical and medical instrument manufacturing	2				1
339113	376	Surgical appliance and supplies manufacturing	2				1
484	394	Truck transportation	2				
5614	455	Business support services	2		1		
32541	160	Pharmaceutical and medicine manufacturing	1				
327211, 327212, 327215	190	Glass and glass products- except glass containers	1				
333319	273	Other commercial and service industry machinery ma	1				
33791	372	Mattress manufacturing	1			1	
339111	374	Laboratory apparatus and furniture manufacturing	1			1	
339115	378	Ophthalmic goods manufacturing	1				
339116	379	Dental laboratories	1				
522	436	Lessors of nonfinancial intangible assets	1				
5412	438	Accounting and bookkeeping services	1				
54161	444	Management consulting services	1				
5611	452	Office administrative services	1				
5613	454	Employment services	1				
5617	458	Services to buildings and dwellings	1				
			110	7	9	7	7

Table 2 (continued)

Tampa Bay  
Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	Implan Sector	Description	Total Frequency	IMPLAN 376 NAICS 339113 Surgical Appliance and Supplies Manufacturing	IMPLAN 377 NAICS 339114 Dental Equipment and Supplies Manufacturing	IMPLAN 378 NAICS 339115 Ophthalmic Goods Manufacturing	IMPLAN 385 NAICS 339991 Gasket, Packing, and Sealing Device Manufacturing	Average All Primary Industries
42	390	Wholesale trade	14	1	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1	1
531	431	Real estate	12	1	1	1	1	1
5133	422	Telecommunications	8	1	1	1	1	1
5411	437	Legal services	7	1	1	1	1	1
334111	302	Electronic computer manufacturing	5	1	1	1	1	1
5413	439	Architectural and engineering services	5	1	1	1	1	1
2211	30	Power generation and supply	4	1	1	1	1	1
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3	1	1	1	1	1
326191, 326199	177	Plastics plumbing fixtures and all other plastics	2	1	1	1	1	1
334510	313	Electromedical apparatus manufacturing	2	1	1	1	1	1
339112	375	Surgical and medical instrument manufacturing	2	1	1	1	1	1
339113	376	Surgical appliance and supplies manufacturing	2	1	1	1	1	1
484	394	Truck transportation	2	1	1	1	1	1
5614	455	Business support services	2	1	1	1	1	1
32541	160	Pharmaceutical and medicine manufacturing	1	1	1	1	1	1
327211, 327212, 327215	190	Glass and glass products- except glass containers	1	1	1	1	1	1
333319	273	Other commercial and service industry machinery ma	1	1	1	1	1	1
33791	372	Mattress manufacturing	1	1	1	1	1	1
339111	374	Laboratory apparatus and furniture manufacturing	1	1	1	1	1	1
339115	378	Ophthalmic goods manufacturing	1	1	1	1	1	1
339116	379	Dental laboratories	1	1	1	1	1	1
522	436	Lessors of nonfinancial intangible assets	1	1	1	1	1	1
5412	438	Accounting and bookkeeping services	1	1	1	1	1	1
54161	444	Management consulting services	1	1	1	1	1	1
5611	452	Office administrative services	1	1	1	1	1	1
5613	454	Employment services	1	1	1	1	1	1
5617	458	Services to buildings and dwellings	1	1	1	1	1	1
			110	9	7	6	5	8

Table 3

Florida  
Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	IMPLAN Sector	Description	Total Frequency	Pharmaceutical IMPLAN 160 NAICS 32541 Pharmaceutical and Medicine Manufacturing	Biotech IMPLAN 446 NAICS 5417 Scientific Research and Development Services	Medical Devices IMPLAN 181 NAICS 32629 Other Rubber Product Manufacturing	IMPLAN 313 NAICS 334510 Electromedical Apparatus Manufacturing
42	390	Wholesale trade	14	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1
531	431	Real estate	13	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1
5133	422	Telecommunications	7	1	1	1	1
334413	311	Semiconductors and related device manufacturing	6	1	1	1	1
5411	437	Legal services	6	1	1	1	1
5413	439	Architectural and engineering services	5	1	1	1	1
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3	1	1	1	1
2211	30	Power generation and supply	2			1	
327211, 327212, 327215	190	Glass and glass products- except glass containers	2		1	1	
334111	302	Electronic computer manufacturing	2			1	
334510	313	Electromedical apparatus manufacturing	2			1	1
339112	375	Surgical and medical instrument manufacturing	2				
339113	376	Surgical appliance and supplies manufacturing	2				
484	394	Truck transportation	2			1	
5614	455	Business support services	2				
21222, 21229	23	Gold- silver- and other metal ore mining	1				
32541	160	Pharmaceutical and medicine manufacturing	1	1			
325991	169	Custom compounding and purchased resins	1				
333319	273	Other commercial and service industry machinery ma	1			1	
33791	372	Mattress manufacturing	1				
339111	374	Laboratory apparatus and furniture manufacturing	1				
339115	378	Ophthalmic goods manufacturing	1				
339116	379	Dental laboratories	1				
522	436	Lessors of nonfinancial intangible assets	1	1			
5412	438	Accounting and bookkeeping services	1				
54161	444	Management consulting services	1		1		
5611	452	Office administrative services	1		1		
5613	454	Employment services	1		1		
			110	6	10	6	10

Table 3 (continued)

Florida

Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	IMPLAN Sector	Description	Total Frequency	IMPLAN 317 NAICS 334514 Totalizing Fluid Meters and Counting Devices	IMPLAN 319 NAICS 334516 Analytical Laboratory Instrument Manufacturing	IMPLAN 374 NAICS 339111 Laboratory Apparatus and Furniture Manufacturing	IMPLAN 375 NAICS 339112 Surgical and Medical Instrument Manufacturing
42	390	Wholesale trade	14	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1
531	431	Real estate	13	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1
5133	422	Telecommunications	7	1	1	1	1
334413	311	Semiconductors and related device manufacturing	6	1	1	1	1
5411	437	Legal services	6				
5413	439	Architectural and engineering services	5	1	1		
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3	1	1		
2211	30	Power generation and supply	2				
327211, 327212, 327215	190	Glass and glass products- except glass containers	2		1		
334111	302	Electronic computer manufacturing	2				
334510	313	Electromedical apparatus manufacturing	2				
339112	375	Surgical and medical instrument manufacturing	2				1
339113	376	Surgical appliance and supplies manufacturing	2				1
484	394	Truck transportation	2				
5614	455	Business support services	2		1		
21222, 21229	23	Gold- silver- and other metal ore mining	1				
32541	160	Pharmaceutical and medicine manufacturing	1				
325991	169	Custom compounding and purchased resins	1	1			
333319	273	Other commercial and service industry machinery ma	1				
33791	372	Mattress manufacturing	1			1	
339111	374	Laboratory apparatus and furniture manufacturing	1			1	
339115	378	Ophthalmic goods manufacturing	1				
339116	379	Dental laboratories	1				
522	436	Lessors of nonfinancial intangible assets	1				
5412	438	Accounting and bookkeeping services	1				
54161	444	Management consulting services	1				
5611	452	Office administrative services	1				
5613	454	Employment services	1				
			110	8	10	8	8



Table 3 (continued)

Florida

Tier 1 Industries, Frequency by Implan Sector, ALL Implan Sectors

NAICS Sector	IMPLAN Sector	Description	Total Frequency	IMPLAN 376 NAICS 339113 Surgical Appliance and Supplies Manufacturing	IMPLAN 377 NAICS 339114 Dental Equipment and Supplies Manufacturing	IMPLAN 378 NAICS 339115 Ophthalmic Goods Manufacturing	IMPLAN 385 NAICS 339991 Gasket, Packing, and Sealing Device Manufacturing	Average All Primary Industries
42	390	Wholesale trade	14	1	1	1	1	1
54191, 54193, 54199	450	All other miscellaneous professional and technical	14	1	1	1	1	1
531	431	Real estate	13	1	1	1	1	1
55	451	Management of companies and enterprises	13	1	1	1	1	1
5133	422	Telecommunications	7	1				1
334413	311	Semiconductors and related device manufacturing	6					
5411	437	Legal services	6	1				1
5413	439	Architectural and engineering services	5					
334412, 14, 15, 16, 17, 18, 19	312	All other electronic component manufacturing	3					
2211	30	Power generation and supply	2				1	
327211, 327212, 327215	190	Glass and glass products- except glass containers	2					
334111	302	Electronic computer manufacturing	2					
334510	313	Electromedical apparatus manufacturing	2	1				
339112	375	Surgical and medical instrument manufacturing	2	1				
339113	376	Surgical appliance and supplies manufacturing	2	1				
484	394	Truck transportation	2				1	
5614	455	Business support services	2					1
21222, 21229	23	Gold- silver- and other metal ore mining	1		1			
32541	160	Pharmaceutical and medicine manufacturing	1					
325991	169	Custom compounding and purchased resins	1					
333319	273	Other commercial and service industry machinery ma	1					
33791	372	Mattress manufacturing	1					
339111	374	Laboratory apparatus and furniture manufacturing	1					
339115	378	Ophthalmic goods manufacturing	1		1			
339116	379	Dental laboratories	1					
522	436	Lessors of nonfinancial intangible assets	1					
5412	438	Accounting and bookkeeping services	1					
54161	444	Management consulting services	1					
5611	452	Office administrative services	1					
5613	454	Employment services	1					
			110	9	7	5	6	7

### III. Baseline Contributions of the Medical Products Industry Group.

We use IMPLAN to define the baseline contributions of each industry component of the Medical Products Industry Group. **Table 4** shows the 2004 baseline contributions in Tampa Bay. The three contribution measurements are Output (which is akin to sales), Employment, and Employee Compensation. These terms are different ways of measuring the same economic phenomenon, similar to the measures of weight, density, and volume being different ways of describing the same solid. Employee Compensation is a component of Value Added. Additional value added terms included in Table 4 are Proprietor Income, Other Property Income (or returns to capital), Indirect Business Tax, and Total Value Added. Later in this report, the term “Labor Income” is used to describe the economic impact of the cluster. Labor Income is the sum of Employee Compensation plus Proprietor Income.

**Table 4**  
**Medical Products Industry Group**  
**Baseline Contributions – Tampa Bay**

Output, Value Added and Employment  
14-Feb-07  
Base Year: 2004  
Copyright MIG 2007  
Model Name: TB04.iap

IMPLAN Sector	Industry	Industry Output*	Employment	Employee Compensation*	Proprietor Income*	Other Property Income*	Indirect Business Tax*	Total Value Added*
<b>Pharmaceutical Segment</b>								
160	Pharmaceutical and medicine manufacturing	841.920	1,073	65.465	3.694	64.393	3.593	137.145
<b>Biotech Segment</b>								
446	Scientific research and development services	241.732	2,684	115.748	21.341	-10.586	1.070	127.573
<b>Medical Devices Segment</b>								
181	Other rubber product manufacturing	61.036	331	14.005	0.320	8.596	0.388	23.308
271	Optical instrument and lens manufacturing	48.600	238	15.339	1.272	1.719	0.237	18.566
313	Electromedical apparatus manufacturing	615.094	1,758	116.163	0.651	2.924	2.527	122.264
317	Totalizing fluid meters and counting devices	0.404	2	0.032	0.011	0.002	0.001	0.046
319	Analytical laboratory instrument manufacturing	107.382	373	30.364	0.162	-0.137	0.525	30.913
374	Laboratory apparatus and furniture manufacturing	17.282	95	1.445	3.453	-0.296	0.060	4.662
375	Surgical and medical instrument manufacturing	573.224	2,319	110.525	63.876	101.694	2.504	278.599
376	Surgical appliance and supplies manufacturing	431.567	1,712	88.215	42.882	74.362	2.053	207.511
377	Dental equipment and supplies manufacturing	6.820	43	1.273	0.528	0.472	0.026	2.299
378	Ophthalmic goods manufacturing	523.807	1,821	94.853	96.242	114.060	2.508	307.663
385	Gasket- packing- and sealing device manufacturing	3.325	20	0.538	1.023	0.085	0.015	1.661
Sub-Totals, Medical Devices Segment		2388.541	8,712	472.752	210.420	303.481	10.844	997.492
Totals, Medical Products Industry Group		3472.193	12,469	653.965	235.455	357.288	15.507	1262.210

\*Millions of dollars

**Table 5** presents baseline contributions of the Medical Products Industry Group for 2004 in Florida. The statewide contributions are on an order of magnitude roughly 3 to 4 times the contributions in Tampa Bay. Thus, Tampa Bay's baseline contribution to the Medical Products Industry Group is about 30% of the statewide baseline economic activity of the group in each measure.

**Table 5**

**Medical Products Industry Group  
Baseline Contributions – Florida**

Output, Value Added and Employment  
14-Feb-07  
Base  
Year: 2004  
Copyright MIG 2007  
Model Name: FL04.iap

IMPLAN Sector	Industry	Industry Output*	Employment	Employee Compensation*	Proprietor Income*	Other Property Income*	Indirect Business Tax*	Total Value Added*
<b>Pharmaceutical Segment</b>								
160	Pharmaceutical and medicine manufacturing	3327.183	4,149	266.208	30.414	282.517	15.763	594.902
<b>Biotech Segment</b>								
446	Scientific research and development services	1883.682	18,045	1004.351	180.634	-91.581	9.255	1102.659
<b>Medical Devices Segment</b>								
181	Other rubber product manufacturing	323.885	1734	73.640	3.164	46.790	2.111	125.705
271	Optical instrument and lens manufacturing	337.388	1608	114.792	4.800	12.753	1.761	134.106
313	Electromedical apparatus manufacturing	1269.086	3,587	249.377	2.558	6.297	5.443	263.675
317	Totalizing fluid meters and counting devices	166.261	500	23.346	0.229	1.487	0.692	25.754
319	Analytical laboratory instrument manufacturing	181.162	620	52.688	0.606	-0.240	0.918	53.971
374	Laboratory apparatus and furniture manufacturing	92.516	480	20.290	9.339	-1.834	0.374	28.170
375	Surgical and medical instrument manufacturing	2324.624	8,547	494.427	239.826	431.636	10.629	1176.518
376	Surgical appliance and supplies manufacturing	899.925	3,590	196.816	76.703	153.653	4.241	431.413
377	Dental equipment and supplies manufacturing	119.334	576	29.649	11.828	10.835	0.593	52.905
378	Ophthalmic goods manufacturing	1243.871	4,883	294.042	131.031	287.856	6.329	719.257
385	Gasket- packing- and sealing device manufacturing	39.716	273	11.821	4.94	0.834	0.145	17.74
Sub-Totals, Medical Devices Segment		6997.768	26,398	1560.888	485.024	950.067	33.236	3029.214
Totals, Medical Products Industry Group		12208.633	48,592	2831.447	696.072	1141.003	58.254	4726.775

\*Millions of dollars

## IV. Employment Structure of the Medical Products Industry Group.

We use the State of Florida's Unemployment Insurance data to compile the number of employees, average wages, and number of firms for each of the primary industries. The Florida Unemployment Insurance data is also known as the Bureau of Labor Statistics (BLS) Covered Employment and Wages data, and is based on the national Unemployment Insurance program for which premiums are collected monthly by state agencies. For this study, we use annualized average Florida Unemployment Insurance data from the year 2005, which is the latest complete annual period available to us.

We choose five wage brackets to describe the average firm wage in each county and Tampa Bay. We determined these wage brackets from the 2007 State of Florida Incentives Average Wage Requirements for companies seeking application for tax incentive amounts from programs such as the Qualified Target Industry program.<sup>4</sup> In this case, we choose the statewide average wage of \$36,000 as the average wage to be applied consistently across all counties and Tampa Bay. The limits of the wage brackets are increments of the average wage: 100%, 115%, 150%, and 200%. The five wage brackets we chose are: \$0-36,000; \$36,001-41,500; \$41,501-54,000; \$54,001-72,000; and greater than \$72,000 per year.

For each segment of the Medical Products Industry Group, **Table 6** reports the aggregated NAICS designation, employment by firm average wage bracket, and number of firms in each county of Tampa Bay. The data are based on annualized 2005 Florida Unemployment Insurance data. We determine the firm average wage in each industry as the quotient of the total wages in a particular industry in a county divided by the total employment in the industry in the county. All jobs in a particular industry are then categorized into a wage bracket indicated by the firm average wage. For example, the three firms in the Pharmaceutical Segment in Hillsborough County employed 55 workers in 2005, who earned average wages between \$41,501 and \$54,000.

Certain employment amounts may not be reported when non-disclosure rules apply. The state's non-disclosure rules are if there are two or fewer firms in a particular industry located in a county or region, employment amounts and wage levels may not be disclosed. Also, if any single firm employs 80% or more of the workers in a particular industry in a county or region, none of the employment or wage data for that industry may be disclosed.

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<sup>4</sup> A copy of the eFlorida.com Incentive Information Sheet for Incentives Average Wage Requirements, effective January 1, 2007, was obtained from officials at the Pinellas County Economic Development, and is based on 2005 average annual county wage data.

Table 6

Medical Products Industry Group

Hernando County  
Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541	Non-Disclosure Rules Apply					2
Total Pharmaceutical Segment		Non-Disclosure Rules Apply					2
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171	Non-Disclosure Rules Apply					2
Total Biotech Segment		Non-Disclosure Rules Apply					2
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629						0
Optical instrument and lens manufacturing	333314						0
Electromedical and electrotherapeutic apparatus mfg	33451						0
Medical equipment and supplies manufacturing	33911	Non-Disclosure Rules Apply					1
Gasket, packing, and sealing device mfg.	339991						0
Total Medical Devices Segment		Non-Disclosure Rules Apply					1
Medical Products Industry Group		17	0	13	0	0	5

Hillsborough County  
Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541						3
Total Pharmaceutical Segment		0	0	55	0	0	3
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171						56
Total Biotech Segment		0	0	869	0	0	56
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629	136	8				4
Optical instrument and lens manufacturing	333314	Non-Disclosure Rules Apply					1
Electromedical and electrotherapeutic apparatus mfg	33451	Non-Disclosure Rules Apply					2
Medical equipment and supplies manufacturing	33911	315				617	15
Gasket, packing, and sealing device mfg.	339991	Non-Disclosure Rules Apply					2
Total Medical Devices Segment		451	8	23	617	10	24
Medical Products Industry Group		451	8	947	617	10	83

Table 6 (continued)

Medical Products Industry Group

Manatee County

Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>'\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541						0
Total Pharmaceutical Segment		0	0	0	0	0	0
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171					20	8
Total Biotech Segment		0	0	0	0	20	8
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629						1
Optical instrument and lens manufacturing	333314						1
Electromedical and electrotherapeutic apparatus mfg	33451						0
Medical equipment and supplies manufacturing	33911	470		2		1	8
Gasket, packing, and sealing device mfg.	339991						1
Total Medical Devices Segment		471	0	32	0	1	11
Medical Products Industry Group		471	0	32	0	21	19

Pasco County

Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>'\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541						1
Total Pharmaceutical Segment							1
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171					124	10
Total Biotech Segment		0	0	0	0	124	10
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629						0
Optical instrument and lens manufacturing	333314			251			3
Electromedical and electrotherapeutic apparatus mfg	33451						0
Medical equipment and supplies manufacturing	33911	14	2				5
Gasket, packing, and sealing device mfg.	339991						1
Total Medical Devices Segment		14	2	256	0	0	9
Medical Products Industry Group		18	2	256	0	124	20

Table 6 (continued)

Medical Products Industry Group

Pinellas County  
Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>'\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541		41	1,001			10
Total Pharmaceutical Segment		0	41	1,001	0	0	10
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171			347			45
Total Biotech Segment		0	0	347	0	0	45
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629		628				5
Optical instrument and lens manufacturing	333314		Non-Disclosure Rules Apply				1
Electromedical and electrotherapeutic apparatus mfg	33451			785			7
Medical equipment and supplies manufacturing	33911	112	1,502	926	616		43
Gasket, packing, and sealing device mfg.	339991						0
Total Medical Devices Segment		112	2,163	1,711	616	0	56
Medical Products Industry Group		112	2,204	3,059	616	0	111

Polk County  
Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>'\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541			11	7		3
Total Pharmaceutical Segment		0	0	11	7	0	3
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171			22			6
Total Biotech Segment		0	0	22	0	0	6
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629		Non-Disclosure Rules Apply				1
Optical instrument and lens manufacturing	333314		Non-Disclosure Rules Apply				0
Electromedical and electrotherapeutic apparatus mfg	33451		Non-Disclosure Rules Apply				1
Medical equipment and supplies manufacturing	33911	1	53				4
Gasket, packing, and sealing device mfg.	339991						0
Total Medical Devices Segment		22	53	0	0	0	6
Medical Products Industries Cluster		22	53	33	7	0	15

Table 6 (continued)

Medical Products Industry Group

Sarasota County  
Employment by Firm Average Wage Level and Number of Firms

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	>\$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541		10	28			4
Total Pharmaceutical Segment		0	10	28	0	0	4
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171		335				19
Total Biotech Segment		0	335	0	0	0	19
<b>Medical Devices Segment</b>							
Other rubber product manufacturing	32629		Non-Disclosure Rules Apply				2
Optical instrument and lens manufacturing	333314		Non-Disclosure Rules Apply				1
Electromedical and electrotherapeutic apparatus mfg	33451		Non-Disclosure Rules Apply				2
Medical equipment and supplies manufacturing	33911	10	220		2		7
Gasket, packing, and sealing device mfg.	339991						0
Total Medical Devices Segment		10	220	230	13	0	12
Medical Products Industry Group		10	565	258	13	0	35

Table 6 shows Employment by Wage Level and Number of Firms in each county of Tampa Bay for the reportable components of the Medical Products Industry Group. The components are categorized to the three segments: Pharmaceutical, Biotech, and Medical Devices, with specific data for five aggregated components of the Medical Devices Segment. The aggregated primary components generally avoid non-disclosure requirements to allow some detail to be reported. However, non-disclosure rules apply to some of the aggregated amounts, as indicated in the Hernando County results. As would be expected, the largest total number of firms in the primary industries of the Medical Products Industry Group is located in the metropolitan counties of Hillsborough and Pinellas, where 83 and 111 firms are located, respectively. Employment in firms in the Medical Products Industry Group is concentrated mainly in Pinellas County, and to a lesser extent, Hillsborough County. Average firm wages paid by the group's firms in Pinellas County are heavily concentrated in the brackets between statewide average wage and 150% of the statewide average wage. The next highest concentration of total firms and employees are located in Sarasota County, where 35 firms were in business in 2005 with wage ranges similar to firms in Pinellas. Most of the firms located outside Hillsborough, Pinellas, and Sarasota County are evenly distributed among Manatee, Pasco, and Polk County. The fewest number of firms in the group are located in Hernando County.



Table 7

## Medical Products Industry Group

**Tampa Bay**  
**Employment by Firm Average Wage Level and Number of Firms**

	NAICS	Employees by Firm Average Wage					Number of Firms
		\$0-36k	\$36-41.5k	\$41.5-54k	\$54-72k	> \$72k	
<b>Pharmaceutical Segment</b>							
Pharmaceutical and medicine manufacturing	32541	18	51	1,095	7	0	23
<b>Total Pharmaceutical Segment</b>		<b>18</b>	<b>51</b>	<b>1,095</b>	<b>7</b>	<b>0</b>	<b>23</b>
<b>Biotech Segment</b>							
Physical, engineering and biological research	54171	3	335	1,238	0	144	146
<b>Total Biotech Segment</b>		<b>3</b>	<b>335</b>	<b>1,238</b>	<b>0</b>	<b>144</b>	<b>146</b>
<b>Medical Devices Segment</b>							
Rubber product mfg. for mechanical use	326291	0	533	0	0	0	4
All other rubber product manufacturing	326299	140	103	10	0	0	9
Optical instrument and lens manufacturing	333314	0	33	283	11	0	7
Electromedical and electrotherapeutic apparatus mfg.	33451	17	0	1,026	0	0	12
Laboratory apparatus and furniture mfg.	339111	103	2	0	0	0	3
Surgical and medical instrument manufacturing	339112	0	1,502	0	617	1	15
Surgical appliance and supplies manufacturing	339113	448	273	13	616	0	38
Dental equipment and supplies manufacturing	339114	116	0	0	2	0	7
Ophthalmic goods manufacturing	339115	255	0	928	0	0	20
Gasket, packing, and sealing device mfg.	339991	1	0	5	0	10	4
<b>Total Medical Devices Segment</b>		<b>1,080</b>	<b>2,446</b>	<b>2,265</b>	<b>1,246</b>	<b>11</b>	<b>119</b>
<b>Medical Products Industry Group</b>		<b>1,101</b>	<b>2,832</b>	<b>4,598</b>	<b>1,253</b>	<b>155</b>	<b>288</b>

**Table 7** reports Employment by Wage Level and Number of Firms for Tampa Bay. When all the counties of Tampa Bay are considered as a group, there are fewer items where non-disclosure rules apply. Compared to the individual county results, less aggregation allows more detail to be presented for the primary industries of the Medical Products Segment. But, NAICS 334510, 334514, and 334516 require aggregation to NAICS 33451 in order to report the data. In Tampa Bay, the most firms in the primary industries of the group are in the Biotech Segment. The 146 Biotech firms in Tampa Bay employ 1,720 workers, where wages are generally higher than the average wage by 15-50%. The Pharmaceutical Segment employs 1,171 workers in Tampa Bay in 23 firms. The predominant firm wage bracket for the Pharmaceutical Segment is between 115% and 150% of the statewide average wage in 2005. There were 7,048 jobs in the Medical Devices Segment in Tampa Bay in 2005. The 119 firms in Tampa Bay that were included in this segment paid average firm wages generally higher than the statewide average wage – almost 6,000 jobs were in wage brackets higher than the statewide average wage.

Table 8

## Medical Products Industry Group

**Florida**  
**Number of Firms, Total Wages, Employment, and Average Wage**

	NAICS	Number of Firms	Total Wages Paid in 2005	Number of Employees	Average Wage
<b>Pharmaceutical Segment</b>					
Medicinal and botanical manufacturing	325411	22	\$ 9,292,777	261	\$ 35,605
Pharmaceutical preparation manufacturing	325412	62	\$ 209,472,139	3,710	\$ 56,461
In-vitro diagnostic substance manufacturing	325413	5	\$ 8,985,474	134	\$ 67,056
Other biological product manufacturing	325414	5	\$ 1,728,305	36	\$ 48,008
<b>Total Pharmaceutical Segment</b>		<b>94</b>	<b>\$ 229,478,695</b>	<b>4,141</b>	<b>\$ 55,416</b>
<b>Biotech Segment</b>					
Physical, engineering and biological research	541710	779	\$ 750,202,309	10,741	\$ 69,845
<b>Total Biotech Segment</b>		<b>779</b>	<b>\$ 750,202,309</b>	<b>10,741</b>	<b>\$ 69,845</b>
<b>Medical Devices Segment</b>					
Rubber product mfg. for mechanical use	326291	10	\$ 36,640,962	876	\$ 41,828
All other rubber product manufacturing	326299	32	\$ 27,461,804	720	\$ 38,141
Optical instrument and lens manufacturing	333314	35	\$ 112,754,040	1,986	\$ 56,774
Electromedical apparatus manufacturing	334510	52	\$ 205,251,832	3,699	\$ 55,488
Totalizing fluid meters and counting devices	334514	19	\$ 21,160,045	547	\$ 38,684
Analytical laboratory instrument mfg.	334516	14	\$ 23,165,583	428	\$ 54,125
Laboratory apparatus and furniture mfg.	339111	15	\$ 16,559,876	467	\$ 35,460
Surgical and medical instrument manufacturing	339112	61	\$ 391,182,528	7,692	\$ 50,856
Surgical appliance and supplies manufacturing	339113	167	\$ 164,825,606	4,025	\$ 40,950
Dental equipment and supplies manufacturing	339114	33	\$ 32,217,245	688	\$ 46,827
Ophthalmic goods manufacturing	339115	72	\$ 217,605,026	4,093	\$ 53,165
Gasket, packing, and sealing device mfg.	339991	12	\$ 7,351,671	213	\$ 34,515
<b>Total Medical Devices Segment</b>		<b>522</b>	<b>\$ 1,256,176,218</b>	<b>25,434</b>	<b>\$ 49,390</b>
<b>Medical Products Industry Group</b>		<b>1,395</b>	<b>\$ 2,235,857,222</b>	<b>40,316</b>	<b>\$ 55,458</b>

**Table 8** shows similar data for Florida. The number of firms, Total Wages, Number of Employees, and Average Firm Wage is indicated for each primary industry of the Medical Products Industry Group. Statewide, there were 94 firms in the Pharmaceutical Segment in 2005. These 94 firms employed 4,141 workers, and paid wages averaging over \$55,000 per job. Similar to Tampa Bay, the largest number of firms in Florida is in the Biotech Segment, where there were 779 firms in business in 2005. These firms paid 10,741 employees the highest average annual wage of the three segments at almost \$70,000 per job. The Medical Devices Segment employed the most workers in Florida in 2005, providing jobs for 25,434 workers. The workers in the Medical Devices Segment earned average annual wages of \$49,390, which was more than 150% of the statewide average wage.

## V. Economic Contribution of the Medical Products Industry Cluster.

In this section, we summarize the economic impacts of the Medical Products Industry Cluster in 2004. Economic impact includes the direct effect of the jobs created by firms in the group as well as the indirect and induced effects as the increased economic activity ripples through the economy. Additional detailed analyses for each industry sector in the group is at **Appendix D**.

We measure economic contribution as the sum of direct, indirect, and induced effects. We use the *Counter-factual Approach* for estimating the indirect and induced effects. That is, we virtually remove from the model the quantity of direct output. An underlying assumption of our approach is that when a firm's output is removed from the region's baseline economy, its market share also leaves the region.<sup>5</sup>

We report economic contribution in terms of employment, output, and labor income. Employment refers to jobs (not necessarily workers, as a worker may hold more than one job), output is defined as sales adjusted for inventory changes, and labor income includes wages and benefits paid to workers as well as income for the self-employed.

In **Tables 9, 10 and 11** we report the economic contributions in Tampa Bay. In **Tables 12, 13, and 14** we report the statewide economic contribution.

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<sup>5</sup> Alternatively, a firm's market share could be redistributed to another active firm(s) in a region in the same industry subsector. With this alternative assumption, the economic impact of a firm's removal from the economy is lessened.

**Table 9**  
**Medical Products Industry Cluster**  
**Economic Contributions in 2004 – Tampa Bay**  
**Output Impact**

IMPLAN Sector	Industry	Direct Industry Output (000's)	Indirect Output (000's) Contribution	Induced Output (000's) Contribution	Total Output (000's) Contribution	Output Contribution as a % of Total Regional Output
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	\$ 841,920	\$ 443,994	\$ 200,952	\$ 1,486,866	0.654%
<b>Biotech Segment</b>						
446	Scientific research and development services	\$ 241,732	\$ 91,993	\$ 173,289	\$ 507,014	0.223%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	\$ 61,036	\$ 16,704	\$ 20,289	\$ 98,029	0.043%
271	Optical instrument and lens manufacturing	\$ 48,600	\$ 20,954	\$ 23,809	\$ 93,362	0.041%
313	Electromedical apparatus manufacturing	\$ 615,094	\$ 306,366	\$ 223,694	\$ 1,145,154	0.504%
317	Totalizing fluid meters and counting devices	\$ 404	\$ 169	\$ 104	\$ 677	0.000%
319	Analytical laboratory instrument manufacturing	\$ 107,382	\$ 57,882	\$ 52,228	\$ 217,492	0.096%
374	Laboratory apparatus and furniture manufacturing	\$ 17,282	\$ 8,982	\$ 7,967	\$ 34,231	0.015%
375	Surgical and medical instrument manufacturing	\$ 573,224	\$ 233,478	\$ 259,502	\$ 1,066,204	0.469%
376	Surgical appliance and supplies manufacturing	\$ 431,567	\$ 171,063	\$ 192,021	\$ 794,651	0.350%
377	Dental equipment and supplies manufacturing	\$ 6,820	\$ 2,822	\$ 2,863	\$ 12,504	0.006%
378	Ophthalmic goods manufacturing	\$ 523,807	\$ 166,339	\$ 252,811	\$ 942,957	0.415%
385	Gasket- packing- and sealing device manufacturing	\$ 3,325	\$ 777	\$ 1,851	\$ 5,953	0.003%
Sub-Totals, Medical Devices Segment		\$ 2,388,541	\$ 985,535	\$ 1,037,138	\$ 4,411,214	1.942%
Totals, Medical Products Industry Cluster		\$ 3,472,193	\$ 1,521,522	\$ 1,411,379	\$ 6,405,094	2.819%
Total Regional Output (source: IMPLAN)					\$ 227,197,682	

**Table 9** shows the economic contribution of the Medical Products Industry Cluster in Tampa Bay measured by Output in the region. Total output in Tampa Bay as a result of the cluster activity was over \$6.4 billion. Of this amount, a majority of the output, more than two-thirds, is attributable to the Medical Devices Segment.

**Table 10**  
**Medical Products Industry Cluster**  
**Economic Contributions in 2004 – Tampa Bay**  
**Employment Impact**

IMPLAN Sector	Industry	Direct Employment Contribution	Indirect Employment Contribution	Induced Employment Contribution	Total Employment Contribution	Employment Contribution as a % of Total Regional Employment
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	1,072.9	2,707.8	1,971.4	5,752.1	0.257%
<b>Biotech Segment</b>						
446	Scientific research and development services	2,683.8	895.7	1,700.0	5,279.5	0.236%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	331.2	126.6	199.0	656.8	0.029%
271	Optical instrument and lens manufacturing	238.2	144.9	233.6	616.7	0.028%
313	Electromedical apparatus manufacturing	1,758.5	2,138.3	2,194.5	6,091.3	0.272%
317	Totalizing fluid meters and counting devices	2.0	1.2	1.0	4.2	0.000%
319	Analytical laboratory instrument manufacturing	373.0	517.3	512.4	1,402.7	0.063%
374	Laboratory apparatus and furniture manufacturing	94.8	62.5	78.2	235.5	0.011%
375	Surgical and medical instrument manufacturing	2,318.8	1,644.2	2,545.8	6,508.8	0.291%
376	Surgical appliance and supplies manufacturing	1,711.8	1,161.0	1,883.8	4,756.6	0.213%
377	Dental equipment and supplies manufacturing	42.6	21.1	28.1	91.8	0.004%
378	Ophthalmic goods manufacturing	1,821.5	1,247.1	2,480.1	5,548.7	0.248%
385	Gasket- packing- and sealing device manufacturing	20.3	5.8	18.2	44.3	0.002%
Sub-Totals, Medical Devices Segment		8,712.7	7,070.0	10,174.7	25,957.4	1.161%
Totals, Medical Products Industry Cluster		12,469.4	10,673.5	13,846.1	36,989.0	1.654%
Total Regional Employment (source: IMPLAN)					2,236,389	

**Table 10** shows the economic contribution of the Medical Products Industry Cluster in Tampa Bay measured by Employment in the region. Total employment in Tampa Bay as a result of the cluster activity was almost 37,000 jobs. Of this amount, a majority of the employment, more than 2/3, is attributable to the Medical Devices Segment.

**Table 11**  
**Medical Products Industry Cluster**  
**Economic Contributions in 2004 – Tampa Bay**  
**Labor Income Impact**

IMPLAN Sector	Industry	Direct Industry Labor Income	Indirect Labor Income Contribution	Induced Labor Income Contribution	Total Labor Income Contribution	Labor Income Contribution as a % of Total Regional Labor Income
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	\$ 69,159,432	\$ 128,305,082	\$ 65,959,091	\$ 263,423,605	0.316%
<b>Biotech Segment</b>						
446	Scientific research and development services	\$ 137,089,104	\$ 33,192,936	\$ 56,879,316	\$ 227,161,356	0.273%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	\$ 14,324,727	\$ 5,612,512	\$ 6,659,639	\$ 26,596,878	0.032%
271	Optical instrument and lens manufacturing	\$ 16,610,463	\$ 6,785,079	\$ 7,814,811	\$ 31,210,353	0.037%
313	Electromedical apparatus manufacturing	\$ 116,813,320	\$ 102,999,294	\$ 73,423,991	\$ 293,236,605	0.352%
317	Totalizing fluid meters and counting devices	\$ 43,230	\$ 58,876	\$ 34,106	\$ 136,212	0.000%
319	Analytical laboratory instrument manufacturing	\$ 30,525,932	\$ 20,795,535	\$ 17,142,904	\$ 68,464,371	0.082%
374	Laboratory apparatus and furniture manufacturing	\$ 4,897,472	\$ 2,931,472	\$ 2,615,103	\$ 10,444,047	0.013%
375	Surgical and medical instrument manufacturing	\$ 174,400,688	\$ 80,598,063	\$ 85,177,227	\$ 340,175,978	0.408%
376	Surgical appliance and supplies manufacturing	\$ 131,096,936	\$ 57,591,788	\$ 63,027,706	\$ 251,716,430	0.302%
377	Dental equipment and supplies manufacturing	\$ 1,801,452	\$ 1,011,484	\$ 939,605	\$ 3,752,541	0.005%
378	Ophthalmic goods manufacturing	\$ 191,094,720	\$ 57,329,031	\$ 82,981,017	\$ 331,404,768	0.398%
385	Gasket- packing- and sealing device manufacturing	\$ 1,561,444	\$ 257,102	\$ 607,449	\$ 2,425,995	0.003%
	Sub-Totals, Medical Devices Segment	\$ 683,170,384	\$ 335,970,236	\$ 340,423,558	\$ 1,359,564,178	1.631%
Totals, Medical Products Industry Cluster		\$ 889,418,920	\$ 497,468,254	\$ 463,261,965	\$ 1,850,149,139	2.220%
Total Regional Labor Income (source: IMPLAN)					\$ 83,356,258,000	

**Table 11** shows the economic contribution of the Medical Products Industry Cluster in Tampa Bay measured by Labor Income in the region. Total labor income in Tampa Bay earned as a result of the cluster activity was over \$1.85 billion. Of this amount, a majority of the income, more than 2/3, is attributable to the Medical Devices Segment.

**Table 12**  
**Medical Products Industry Cluster**  
**Economic Contributions in 2004 – Florida**  
**Output Impact**

IMPLAN Sector	Industry	Direct Industry Output (000's)	Indirect Output (000's) Contribution	Induced Output (000's) Contribution	Total Output (000's) Contribution	Output Contribution as a % of Total Regional Output
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	\$ 3,327,183	\$ 1,699,506	\$ 806,172	\$ 5,832,861	0.579%
<b>Biotech Segment</b>						
446	Scientific research and development services	\$ 1,883,682	\$ 628,577	\$ 1,419,181	\$ 3,931,439	0.390%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	\$ 323,885	\$ 88,048	\$ 107,228	\$ 519,162	0.051%
271	Optical instrument and lens manufacturing	\$ 337,388	\$ 144,511	\$ 168,096	\$ 649,995	0.064%
313	Electromedical apparatus manufacturing	\$ 1,269,086	\$ 638,587	\$ 470,264	\$ 2,377,937	0.236%
317	Totalizing fluid meters and counting devices	\$ 166,261	\$ 73,476	\$ 48,856	\$ 288,593	0.029%
319	Analytical laboratory instrument manufacturing	\$ 181,162	\$ 96,846	\$ 88,913	\$ 366,921	0.036%
374	Laboratory apparatus and furniture manufacturing	\$ 92,516	\$ 46,327	\$ 45,424	\$ 184,267	0.018%
375	Surgical and medical instrument manufacturing	\$ 2,324,624	\$ 921,257	\$ 1,059,774	\$ 4,305,656	0.427%
376	Surgical appliance and supplies manufacturing	\$ 899,925	\$ 350,732	\$ 394,937	\$ 1,645,594	0.163%
377	Dental equipment and supplies manufacturing	\$ 119,334	\$ 43,789	\$ 57,442	\$ 220,565	0.022%
378	Ophthalmic goods manufacturing	\$ 1,243,871	\$ 395,700	\$ 566,187	\$ 2,205,758	0.219%
385	Gasket- packing- and sealing device manufacturing	\$ 39,716	\$ 9,991	\$ 20,218	\$ 69,925	0.007%
Sub-Totals, Medical Devices Segment		\$ 6,997,768	\$ 2,809,265	\$ 3,027,340	\$ 12,834,374	1.273%
Totals, Medical Products Industry Cluster		\$ 12,208,633	\$ 5,137,348	\$ 5,252,694	\$ 22,598,674	2.241%
Total State Output (source: IMPLAN)					\$ 1,008,231,394	

**Table 12** shows the economic contribution of the Medical Products Industry Cluster in Florida measured by Output in the state. Total output in Florida as a result of the cluster activity was almost \$22.6 billion. Of this amount, a majority of the output, more than half, is attributable to the Medical Devices Segment.

**Table 13**  
**Medical Products Industry Cluster**  
**Economic Contributions in 2004 – Florida**  
**Employment Impact**

IMPLAN Sector	Industry	Direct Employment Contribution	Indirect Employment Contribution	Induced Employment Contribution	Total Employment Contribution	Employment Contribution as a % of Total Regional Employment
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	4,149.2	10,185.2	7,801.6	22,136.0	0.227%
<b>Biotech Segment</b>						
446	Scientific research and development services	18,045.1	6,152.7	13,733.9	37,931.7	0.389%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	1,733.7	664.5	1,037.7	3,435.9	0.035%
271	Optical instrument and lens manufacturing	1,608.0	984.2	1,626.7	4,218.9	0.043%
313	Electromedical apparatus manufacturing	3,586.8	4,349.4	4,550.9	12,487.1	0.128%
317	Totalizing fluid meters and counting devices	500.2	509.3	472.8	1,482.3	0.015%
319	Analytical laboratory instrument manufacturing	620.3	881.6	860.4	2,362.3	0.024%
374	Laboratory apparatus and furniture manufacturing	480.2	313.1	439.6	1,232.9	0.013%
375	Surgical and medical instrument manufacturing	8,546.8	6,330.4	10,255.8	25,133.0	0.258%
376	Surgical appliance and supplies manufacturing	3,589.8	2,344.2	3,821.9	9,755.9	0.100%
377	Dental equipment and supplies manufacturing	575.6	311.3	555.9	1,442.8	0.015%
378	Ophthalmic goods manufacturing	4,882.8	2,929.6	5,479.2	13,291.6	0.136%
385	Gasket- packing- and sealing device manufacturing	272.8	74.7	195.7	543.2	0.006%
Sub-Totals, Medical Devices Segment		26,397.0	19,692.3	29,296.6	75,385.9	0.773%
Totals, Medical Products Industry Cluster		48,591.3	36,030.2	50,832.1	135,453.6	1.389%
Total State Employment (source: IMPLAN)					9,748,968	

**Table 13** shows the economic contribution of the Medical Products Industry Cluster in Florida measured by Employment in the state. Total employment in Florida as a result of the cluster activity was over 135,000 jobs. Of this amount, a majority of the employment, nearly 2/3, is attributable to the Medical Devices Segment.



Table 14

**Medical Products Industry Cluster  
Economic Contributions in 2004 – Florida  
Labor Income Impact**

IMPLAN Sector	Industry	Direct Industry Labor Income	Indirect Labor Income Contribution	Induced Labor Income Contribution	Total Labor Income Contribution	Labor Income Contribution as a % of Total Regional Labor Income
<b>Pharmaceutical Segment</b>						
160	Pharmaceutical and medicine manufacturing	\$ 296,621,728	\$ 506,172,707	\$ 265,531,201	\$ 1,068,325,636	0.284%
<b>Biotech Segment</b>						
446	Scientific research and development services	\$ 1,184,985,088	\$ 228,250,004	\$ 467,439,584	\$ 1,880,674,676	0.501%
<b>Medical Devices Segment</b>						
181	Other rubber product manufacturing	\$ 76,803,888	\$ 29,975,072	\$ 35,318,078	\$ 142,097,038	0.038%
271	Optical instrument and lens manufacturing	\$ 119,592,048	\$ 47,799,340	\$ 55,366,152	\$ 222,757,540	0.059%
313	Electromedical apparatus manufacturing	\$ 251,935,056	\$ 216,358,214	\$ 154,892,103	\$ 623,185,373	0.166%
317	Totalizing fluid meters and counting devices	\$ 23,575,454	\$ 25,075,954	\$ 16,091,874	\$ 64,743,282	0.017%
319	Analytical laboratory instrument manufacturing	\$ 53,293,700	\$ 35,246,978	\$ 29,285,596	\$ 117,826,274	0.031%
374	Laboratory apparatus and furniture manufacturing	\$ 29,629,416	\$ 15,604,531	\$ 14,961,516	\$ 60,195,463	0.016%
375	Surgical and medical instrument manufacturing	\$ 734,253,120	\$ 321,080,864	\$ 349,060,860	\$ 1,404,394,844	0.374%
376	Surgical appliance and supplies manufacturing	\$ 273,518,816	\$ 119,763,279	\$ 130,081,394	\$ 523,363,489	0.139%
377	Dental equipment and supplies manufacturing	\$ 41,476,672	\$ 15,724,716	\$ 18,919,847	\$ 76,121,235	0.020%
378	Ophthalmic goods manufacturing	\$ 425,072,992	\$ 138,742,331	\$ 186,486,740	\$ 750,302,063	0.200%
385	Gasket- packing- and sealing device manufacturing	\$ 16,761,757	\$ 3,371,869	\$ 6,659,366	\$ 26,792,992	0.007%
Sub-Totals, Medical Devices Segment		\$ 2,045,912,919	\$ 968,743,148	\$ 997,123,526	\$ 4,011,779,593	1.068%
Totals, Medical Products Industry Cluster		\$ 3,527,519,735	\$ 1,703,165,859	\$ 1,730,094,311	\$ 6,960,779,905	1.854%
Total State Labor Income (source: IMPLAN)					\$ 375,516,801,000	

**Table 14** shows the economic contribution of the Medical Products Industry Cluster in Florida measured by Labor Income in the state. Total labor income in Florida earned as a result of the cluster activity was over \$6.96 billion. Of this amount, a majority of the labor income, nearly 2/3, is attributable to the Medical Devices Segment.

## VI. Conclusion.

The purpose of this study is to analyze the extent of clustering of the medical manufacturing and associated industries in Tampa Bay and Florida. The Medical Products Industry Group consists of three segments: the Pharmaceutical Segment, the Biotech Segment, and the Medical Devices Segment. We determine the industries that combine to form the Medical Product Industry Cluster. We determine the direct economic effects, or baseline contributions, of the industries in the Medical Products Industry Group in Tampa Bay and Florida. We also review the data to ascertain the quality and number of direct jobs in the Medical Products Industry Group. Finally, we estimate the economic contribution of the Medical Products Industry Cluster in Tampa Bay and Florida.

To analyze the extent of clustering of the Medical Products Industry Group, we inject a theoretical economic stimulus into each primary industry and observe the effects to supplier-industries in the region. The results are ranked by change in supplier-industry output as a percentage of the direct theoretical economic stimulus. Clusters tend to have common supplier-industries, and the geographic concentration of supplier-industries is indicated by the level of economic effect to the stimulus as well as the number of supplier-industries that exhibit a substantial effect to the stimulus.

For the Medical Products Industry Group in Tampa Bay, Wholesale Trade exhibits the greatest reaction to a theoretical economic stimulus. Following Wholesale Trade, a number of service oriented supplier-industries are affected most. And, some of the primary industries provide inputs for other primary industries in the Medical Products Industry Group. Similar results are noticed in the statewide analysis of Florida, with some variation in the rankings and minimal substitution of individual supplier-industries. In general, the similarity of supplier-industries between the various primary industries leads us to conclude that the Medical Products Industry Group functions as an economic cluster.

Baseline contributions refer to the measures of output, employment, and labor income in the Medical Products Industry Group. We used the IMPLAN software to determine the levels of each measure in Tampa Bay and Florida in 2004. In Tampa Bay, industry output measured almost \$3.5 billion. Of this amount, more than 2/3 was produced by the Medical Devices Segment. In the Medical Products Industry Group there were nearly 12,500 baseline employees, who earned labor income totaling over \$889 million (employee compensation of almost \$654 million and proprietor income over \$235 million). These measures were heavily weighted in the Medical Devices Segment. Baseline contribution measures in Florida were similar to Tampa Bay, except on an order of magnitude of about 3 to 4 times the levels in Tampa Bay. Baseline output in the Medical Products Industry Group was over \$12.2 billion. Baseline employment totaled almost 48,600 workers, who earned labor income over \$3.5 billion (more than \$2.8 billion in employee income and almost \$0.7 billion proprietor income). The baseline contribution amounts in Florida measured by output were composed of about 60% in the Medical Devices Segment, 25% in the Pharmaceutical Segment, and 15% in the Biotech Segment.

We used the State of Florida Unemployment Insurance data to analyze the quality and number of jobs in the Medical Products Industry Group. In 2005, there were 288 firms in Tampa Bay and 1,395 in Florida, which were a part of the Medical Products Industry Group. In Tampa Bay, these firms employed 9,939 workers, almost 90% of whom were paid more than the statewide average wage in that year. Over 70% of the Medical Products Industry Group employment in Tampa Bay was in the Medical Devices Segment. In Florida, there were more than 40,000 workers employed in the Medical Products Industry Group. Of these, about 65% were employed in the Medical Devices Segment, another 25% were in the Biotech Segment, and 10% were employed in the Pharmaceutical Segment. Average wages were highest in the Biotech Segment, and closely followed by the Pharmaceutical Segment. On average, wages of \$55,458 throughout the Medical Products Industry Group in Florida were significantly higher than the statewide average wage in 2005 of just over \$36,000.

We estimated the economic contribution of the Medical Products Industries Cluster to Tampa Bay and statewide. In this study, the economic stimulus is the output of the Medical Products Industries Group. When we virtually remove this output, a ripple effect occurs throughout the economy. The indirect effect is the impact to supplier-industries while the induced effect results from the loss of consumer spending by displaced workers. We report this total economic contribution in terms of output, employment, and labor income.

In 2004, the number of jobs provided by firms in the Medical Product Industries Cluster was almost 37,000 in Tampa Bay and over 135,000 in Florida. This is a multiple of almost three times the number of direct jobs in the Medical Products Industry Group. The labor income earned by workers in these jobs exceeded \$1.85 billion in Tampa Bay and more than \$6.96 billion in Florida. Workers in these jobs produced output valued at more than \$6.4 billion in Tampa Bay and nearly \$22.6 billion in Florida.

The total economic contribution, in terms of the value of the output produced, is over 2.8% of the value of all economic activity in Tampa Bay. In Florida, output in the cluster represents more than 2.2% of total economic activity. The Medical Products Industry Cluster represents a substantial contribution to the diverse economy of the Tampa Bay region and to Florida as a whole. The economic contributions are both growing and sustainable. The economic contributions, in terms of a business life cycle, are characteristic of an industry in the early stages of maturation, one which has not yet reached a peak and which has significant room for further growth.

# Appendix A

## Regional Economic Development Impact Analysis

*The Center for Economic Development Research (CEDR), College of Business Administration, University of South Florida (USF), uses the **IMPLAN Professional**<sup>TM</sup> Social Accounting and Impact Analysis Software (an input-output model) for economic impact analyses. Data (2004) for each county in the state of Florida are available. County-wide data may be aggregated to focus on a region, such as the 7-county region - Hernando, Hillsborough, Manatee, Pasco, Pinellas, Polk and Sarasota - of special importance to the USF community. The following article briefly explains the economic impact analysis and the assumptions upon which the analysis is based.*

### The Impact Analysis.

Economic impact analysis is based on conditional, predictive models of the form: If ...then... An input-output model is one type of model used in impact analysis. Other generally accepted models are the economic base model and the income-expenditure model. Compared with the input-output model, both the economic base and income-expenditure models are limited in application to small economic regions in which the interdependencies (sales/purchase relationships) between producing sectors are insignificant.

Interindustry relationships were first described in 1758 by the Frenchman Francois Quesnay, founder of the physiocratic or “natural order” philosophy of economic thought. The physiocrats depicted the flow of goods and money in a nation, and thus made the first attempt to describe the circular flow of wealth on a macroeconomic basis. Wassily Leontief was born in Russia in 1906 and first studied economic geography at the University of St. Petersburg before moving to Berlin and China. He came to the United States in 1931 and, after a brief 3-month stint at the National Bureau of Economic Research in New York, he was hired by Harvard University. At Harvard, Professor Leontief undertook a research project that encompassed a 42-industry input-output table showing how changes in one sector of the economy lead to changes in other sectors. From this research, he developed the concept of multipliers from input-output tables, and was subsequently awarded the Nobel prize in economics in 1973 for his development of input-output (I-O) economics.

The historical transactions data in the I-O model represent the sales and purchases between sectors that occurred over an estimation period. These data describe each sector’s “purchases” and “sales” linkages with the rest of the economy. For each productive sector the transaction data take into account all sales revenue and costs, with the difference between revenue and costs being profit, which is a part of value added. (Total value added to a product at each stage of its production is the sum of wages and salaries, rents, profits, interest, and dividends.) The historical transaction or descriptive data are used to create the *descriptive* model of information about local economic

interactions called *regional economic* accounts. These accounts, or transaction tables, describe a local economy in terms of the flow of dollars from purchasers to producers within the defined region.

For example, an increase in government purchases (first round) of output from the “manufacturing” sector of a region may require the “manufacturing” industry, in order to expand output, to purchase (second round) factor inputs from other sectors of the regional economy. In turn, these other sectors may have to purchase (third round) inputs to deliver the supporting production of factors to the “manufacturing” sector. The rounds of spending will continue with each round becoming increasingly weaker in its impact because of leakages from the region attributable to imports, savings, and taxes.

The first round is called the direct effects of the change in final demand (consumption) in a sector(s) of the economy. The second and subsequent rounds are collectively referred to as the indirect effects of interindustry purchases (reduction in purchases) in response to direct effects.

The *open* I-O model just described does not take into account changes in spending in the region, in response to the direct effects, for household consumption. Changes in spending from households as income or population increases (decreases) due to changes in the level of production are called induced effects.

Induced effects are incorporated into the I-O descriptive model by forming a *closed* model. That is, transactions of the household sector are made endogenous to the model by treating households as a producing sector. The household sector sells its labor to the other producing sectors and purchases factor inputs, i.e. consumption expenditures, in order to maintain its labor.

There are two steps in impact analysis using the I-O model. First, the descriptive model is created; then, the predictive model is derived from the descriptive model. The descriptive model contains information about interindustry transactions called the *regional economic accounts*. The information describes the flow of dollars from purchasers to producers within the region.

In addition to the regional economic accounts, the descriptive I-O model includes the *social accounts*. Social accounting data include, for example, taxes paid by businesses and households to government, and transfer payments from government to businesses and households. Trade flows also are a part of the social accounts.

Trade flows describe the movement of goods and services between the region and the rest of the world, that is imports and exports. The analyst must choose between *regional purchase coefficients* (RPCs) or supply/demand pooling. RPCs are econometrically derived to predict local purchases based upon a region’s characteristics. In contrast, *supply/demand pooling* presumes everything that can be purchased locally, will be. Hence, it will lead to larger multipliers than RPCs, because the leakages for

imports are less. (The analyst also decides if local purchase coefficients - LPCs - are to be applied to an event during impact analysis. If the LPCs were to be applied, the model's RPCs are used to determine how much of the first-round expenditure is used to purchase local products and how much is for imported items. Otherwise, the RPCs are applied to second and subsequent rounds of spending only.)

The regional economic accounts and social accounts are used to build *multipliers*. The multipliers are the *predictive* I-O model. A set of multipliers are expected changes in output for each industry in the model given a one dollar change in final demand for any particular industry or commodity.

A multiplier measures the effects of a change in final demand(s) in a region. The change in economic activity is called the *impact*. The impact is essentially the expected or predicted consequence of a change in final demand(s) within the region due to a single event or a group of events. A group of related events may be referred to as a project.

A Type I multiplier measures the direct and indirect effects of a change in economic activity. It only captures interindustry effects within the region. In addition to the direct and indirect effects, a Type II multiplier captures the induced effects of changes in household income and expenditures. A Type III multiplier also captures direct, indirect, and induced effects. However, the Type III multiplier estimates the induced effects based upon changes in employment. It assumes the region is at full employment, then each job added or subtracted by the impact is associated with the region's average expenditures per person. A Type II multiplier is most commonly used in impact analyses.

Personal consumption expenditures (PCE) are spending by households and are strongly related to total personal income. Total personal income is income from all sources, including employment income and transfer payments that are based on place of residence. Because of commuting patterns, PCE in a region may not be strongly related to employment income in that location. Hence, the income based induced effects of the Type II multiplier are normally adjusted so that a regional average amount of transfer payments is associated with a change in employment income. Such multiplier is called a Social Accounting Matrices (SAM) Income multiplier. However, suppose that an increase (decrease) in employment income is not anticipated to be associated with a corresponding change in regional transfer payments. For instance, it may be believed that an increase in final demand will only generate low paying jobs. Then, it is likely that the under-employed will be hired and transfer payments will not increase in the region. Accordingly, a Specific Disposable Income may be applied to the Type II multipliers. That is, the change in household consumption expenditures is estimated by disposable income, which is defined as a specified (by the analyst) percentage of employment income.

A change in final demand may be applied to an industry or to a commodity. Industries are businesses producing goods and services; commodities are the goods and services being produced. An industry can make more than one commodity. An industry

usually is named for the primary, by value, commodity it produces. Commodities produced by an industry, other than its primary commodity, are called secondary commodities or by-products. An industry applied change in final demand has a direct effect on the selected industry only. A commodity applied change in final demand directly affects all industries that produce the commodity, whether as a primary or secondary commodity. The analyst chooses between an industry or commodity applied change in final demand. The choice is appropriately based on the circumstance for the change in final demand. The choice will affect the predicted impact.

As an alternative to estimating the economic impact of a change in final demand (“at the factory door”), the analyst may estimate the impact of a change in sales and employee payroll for a particular institution, e.g. state/local government education, or business sector. Then, a typical expenditure pattern for the institution or industry is generated to assess the economic impact of the change in sales and payroll. (If the event under study is believed to have an atypical expenditure pattern, this alternative approach is inappropriate. Instead the analyst should specify the expenditure pattern of the institution or industry in detail.) Using this alternative approach, the direct effect on final demand, i.e. output, in the region will be less than the change in sales. This happens because the model includes the institution’s or industry’s production function and final demand is an estimate of the value, in producer prices, of the factor inputs needed to generate the specified change in level of sales. The difference between the estimated change in final demand and the change in sales is total value added. Also, with this approach, the induced effects are interpreted as resulting from a change in household spending by the suppliers of the institution’s or industry’s factor inputs (first round) as well as subsequent rounds of interindustry sales/purchases.

Margins are used to convert purchaser prices to producer prices. Margins depend on the consumer. For example, households pay the full retail margins, but government may pay little or no retail margins because it has more buying power than individual households. Margins split a purchaser price into appropriate producer values, each value impacting a specific industry. For example, the purchaser price of a tire at an automotive retailer includes the producer price at the factory door plus transportation costs, the wholesaler’s markup, and the retailer’s markup. Unless edited by the analyst, margins used in impact analysis are national averages.

A deflator may be used to convert expenditures to the base year (estimation period) used to calculate predictive multipliers and to inflate the reports of impact analysis to the current year. Deflators are associated with commodities, and are also used to adjust margin values.

A predicted regional impact may be gauged in terms of output (a change in production measured in dollars), of employment (a change in employment measured by number of jobs), or of personal income (a change in income from all sources, including employment and transfer payments, for persons residing in the region).

## I-O Model Assumptions.

The following are the fundamental assumptions of the I-O model. First, it is assumed that the proportions in which each sector purchases its inputs from all other sectors are invariant over the period of analysis. The implications of this assumption are unchanged technology, constant relative prices, no shift in the mix production activities within sectors, and no new significant firm has moved into or out of the region.

Second, the I-O model assumes linear production functions, that is a sector's inputs remain in proportion to its output. This implies that no industry enjoys economies of scale. Third, each sector of the regional economy is assumed to be homogeneous. An increase (decrease) in a sector's final demand will always have the same impact on the economy. And fourth, in the closed I-O model, it is assumed that the household sector's marginal propensity to consume equals its average propensity to consume.



## Appendix B

### Detailed Rankings of Supplier-Industries of the Medical Products Industry Group in Tampa Bay

This section presents the detailed results of the cluster analysis in Tampa Bay using IMPLAN. We analyzed each primary industry to determine the supplier-industries that combine to form the cluster in the region. To do this, we injected a theoretical \$100 million increase in output in each primary industry. The result of this economic shock was to produce a theoretical increase in indirect output for each industry associated with the primary industry. The extent of indirect output effect for each primary industry is depicted in the following tables listing supplier-industries ranked from highest to lowest percentage of direct impact for the first 50+/- indirectly affected industries. The results are ranked in three tiers – Tier 1 supplier-industries are those in which the indirect effect is greater than 1% of the theoretical direct impact. Tier 2 supplier-industries are those in which the indirect effect is between 0.5% and 1% of the direct impact. And, Tier 3 supplier-industries are those in which the indirect effect is less than 0.5% of the direct impact. We then analyze the Tier 1 supplier-industries to ascertain whether there is any consistency from one primary industry to another. The results of this analysis are presented in Table 2 in the body of the text above.

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact

5-Feb-07

Implan Model: TB04.iap

Copyright MIG 2007

Impact Name: 160Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 160  
NAICS 32541  
Pharmaceutical  
and Medicine  
Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
32541	160	Pharmaceutical and medicine manufacturing	11.8625%
42	390	Wholesale trade	6.6869%
55	451	Management of companies and enterprises	6.5427%
54191, 54193, 54199	450	All other miscellaneous professional and technical	2.2828%
522	436	Lessors of nonfinancial intangible assets	1.5330%
531	431	Real estate	1.1620%
5411	437	Legal services	1.0377%
			<u>TIER 2: 0.5% - 1%</u>
5418	447	Advertising and related services	0.9992%
521, 5221	430	Monetary authorities and depository credit interme	0.9626%
493	400	Warehousing and storage	0.9328%
5133	422	Telecommunications	0.9295%
2211	30	Power generation and supply	0.9271%
5412	438	Accounting and bookkeeping services	0.7845%
5222, 5223	425	Nondepository credit intermediation and related a	0.7220%
5417	446	Scientific research and development services	0.7127%
484	394	Truck transportation	0.5948%
54161	444	Management consulting services	0.5909%
51111	413	Newspaper publishers	0.5515%
722	481	Food services and drinking places	0.5489%
5413	439	Architectural and engineering services	0.5026%
			<u>TIER 3</u>
211	19	Oil and gas extraction	0.4922%
32611	172	Plastics packaging materials- film and sheet	0.4426%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4061%
51112	414	Periodical publishers	0.3967%
5131	420	Radio and television broadcasting	0.3923%
23*	43	Maintenance and repair of nonresidential buildings	0.3882%
5121	418	Motion picture and video industries	0.3721%
5613	454	Employment services	0.3625%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.3474%
8113	485	Commercial machinery repair and maintenance	0.3239%
6112, 6113	462	Colleges- universities- and junior colleges	0.2785%
8112	484	Electronic equipment repair and maintenance	0.2661%
492	399	Couriers and messengers	0.2463%
5617	458	Services to buildings and dwellings	0.2349%
562	460	Waste management and remediation services	0.2334%
5142	424	Data processing services	0.2269%
523	426	Securities- commodity contracts- investments	0.2224%
72111, 72112	479	Hotels and motels- including casino hotels	0.2220%
5614	455	Business support services	0.2162%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2098%
21239	26	Other nonmetallic mineral mining	0.2067%
5611	452	Office administrative services	0.1977%
	499	Other State and local government enterprises	0.1875%
5324	434	Machinery and equipment rental and leasing	0.1764%
481	391	Air transportation	0.1558%
1114	6	Greenhouse and nursery production	0.1353%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact  
 Implan Model: TB04.iap  
 Impact Name: 446Cluster-rpc100

5-Feb-07  
 Copyright MIG 2007  
 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 446  
 NAICS 5417  
 Scientific Research  
 and Development  
 Services

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
531	431	Real estate	4.1566%
5411	437	Legal services	2.2033%
5613	454	Employment services	2.1183%
54191, 54193, 54199	450	All other miscellaneous professional and technical	2.0984%
42	390	Wholesale trade	1.7262%
5133	422	Telecommunications	1.3655%
5611	452	Office administrative services	1.3285%
54161	444	Management consulting services	1.2513%
5413	439	Architectural and engineering services	1.2464%
2211	30	Power generation and supply	1.2135%
5617	458	Services to buildings and dwellings	1.1074%
			<u>TIER 2: 0.5% - 1%</u>
23*	43	Maintenance and repair of nonresidential buildings	0.8559%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.8492%
5222, 5223	425	Nondepository credit intermediation and related a	0.7821%
5412	438	Accounting and bookkeeping services	0.7737%
325612	164	Polish and other sanitation good manufacturing	0.6809%
521, 5221	430	Monetary authorities and depository credit interme	0.6686%
722	481	Food services and drinking places	0.6205%
55	451	Management of companies and enterprises	0.5856%
			<u>TIER 3</u>
491110	398	Postal service	0.4809%
8113	485	Commercial machinery repair and maintenance	0.4423%
	499	Other State and local government enterprises	0.4346%
523	426	Securities- commodity contracts- investments	0.4055%
5614	455	Business support services	0.3965%
5324	434	Machinery and equipment rental and leasing	0.3801%
484	394	Truck transportation	0.3353%
5418	447	Advertising and related services	0.3246%
211	19	Oil and gas extraction	0.3175%
541512	442	Computer systems design services	0.3092%
51112	414	Periodical publishers	0.3005%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2906%
8134, 8139	493	Civic- social- professional and similar organizati	0.2662%
72111, 72112	479	Hotels and motels- including casino hotels	0.2584%
5616	457	Investigation and security services	0.2550%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.2451%
8112	484	Electronic equipment repair and maintenance	0.2425%
5321	432	Automotive equipment rental and leasing	0.2375%
492	399	Couriers and messengers	0.2300%
5241	427	Insurance carriers	0.2258%
5619	459	Other support services	0.2198%
454	412	Nonstore retailers	0.1980%
51111	413	Newspaper publishers	0.1925%
5142	424	Data processing services	0.1909%
481	391	Air transportation	0.1794%
	498	State and local government electric utilities	0.1718%
334511	314	Search- detection- and navigation instruments	0.1510%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact	5-Feb-07		
Implan Model: TB04.iap	Copyright MIG 2007		Primary Industry:
Impact Name: 181Cluster-rpc100	Type II Multipliers w/ RPC's 100% 1st round		IMPLAN 181
			NAICS 32629
			Other Rubber
			Product
			Manufacturing
<b>NAICS</b>	<b>IMPLAN</b>		
<b>Sector</b>	<b>Industry</b>	<b>Description</b>	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	4.0487%
55	451	Management of companies and enterprises	2.4704%
484	394	Truck transportation	1.9893%
2211	30	Power generation and supply	1.3966%
5413	439	Architectural and engineering services	1.1581%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1153%
			<u>TIER 2: 0.5% - 1%</u>
531	431	Real estate	0.8426%
521, 5221	430	Monetary authorities and depository credit interme	0.6794%
5222, 5223	425	Nondepository credit intermediation and related a	0.6207%
5133	422	Telecommunications	0.5502%
8113	485	Commercial machinery repair and maintenance	0.5131%
			<u>TIER 3</u>
211	19	Oil and gas extraction	0.4745%
722	481	Food services and drinking places	0.4728%
482	392	Rail transportation	0.4687%
5411	437	Legal services	0.3951%
5412	438	Accounting and bookkeeping services	0.3856%
54161	444	Management consulting services	0.3810%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.3471%
23*	43	Maintenance and repair of nonresidential buildings	0.2858%
8112	484	Electronic equipment repair and maintenance	0.2817%
21239	26	Other nonmetallic mineral mining	0.2715%
5613	454	Employment services	0.2423%
32611	172	Plastics packaging materials- film and sheet	0.2317%
5418	447	Advertising and related services	0.2233%
493	400	Warehousing and storage	0.2148%
5324	434	Machinery and equipment rental and leasing	0.2103%
523	426	Securities- commodity contracts- investments	0.2087%
562	460	Waste management and remediation services	0.2075%
	498	State and local government electric utilities	0.1990%
5241	427	Insurance carriers	0.1807%
491110	398	Postal service	0.1753%
325312	157	Phosphatic fertilizer manufacturing	0.1698%
	499	Other State and local government enterprises	0.1670%
492	399	Couriers and messengers	0.1663%
72111, 72112	479	Hotels and motels- including casino hotels	0.1637%
32612	173	Plastics pipe- fittings- and profile shapes	0.1624%
5617	458	Services to buildings and dwellings	0.1598%
487, 488	397	Scenic and sightseeing transportation and support	0.1548%
325212	153	Synthetic rubber manufacturing	0.1423%
481	391	Air transportation	0.1399%
5614	455	Business support services	0.1391%
8114	486	Household goods repair and maintenance	0.1382%
5321	432	Automotive equipment rental and leasing	0.1301%
5611	452	Office administrative services	0.1286%
32511	147	Petrochemical manufacturing	0.1253%
5417	446	Scientific research and development services	0.1231%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact  
 Implan Model: TB04.iap  
 Impact Name: 271Cluster-rpc100

5-Feb-07  
 Copyright MIG 2007  
 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 271  
 NAICS 333314  
 Optical Instrument  
 and Lens  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	5.5822%
55	451	Management of companies and enterprises	4.4200%
334111	302	Electronic computer manufacturing	3.2691%
327211, 327212, 327215	190	Glass and glass products- except glass containers	1.9005%
531	431	Real estate	1.5352%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.3958%
2211	30	Power generation and supply	1.1633%
5412	438	Accounting and bookkeeping services	1.0909%
5133	422	Telecommunications	1.0540%
333319	273	Other commercial and service industry machinery	1.0338%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	1.0246%
			<u>TIER 2: 0.5% - 1%</u>
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.9603%
5411	437	Legal services	0.9230%
521, 5221	430	Monetary authorities and depository credit interme	0.8446%
5418	447	Advertising and related services	0.8071%
5222, 5223	425	Nondepository credit intermediation and related a	0.7645%
484	394	Truck transportation	0.7348%
	499	Other State and local government enterprises	0.5485%
5413	439	Architectural and engineering services	0.5291%
722	481	Food services and drinking places	0.5059%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4855%
493	400	Warehousing and storage	0.4833%
51111	413	Newspaper publishers	0.4433%
23*	43	Maintenance and repair of nonresidential buildings	0.4351%
8113	485	Commercial machinery repair and maintenance	0.4166%
541511	441	Custom computer programming services	0.3892%
33291	248	Metal valve manufacturing	0.3868%
32612	173	Plastics pipe- fittings- and profile shapes	0.3782%
523	426	Securities- commodity contracts- investments	0.3652%
5417	446	Scientific research and development services	0.3376%
51112	414	Periodical publishers	0.3204%
211	19	Oil and gas extraction	0.3097%
5613	454	Employment services	0.3019%
5131	420	Radio and television broadcasting	0.3016%
32611	172	Plastics packaging materials- film and sheet Automotive repair and maintenance- except car wash	0.2721%
81111, 81112, 811191, 811198	483		0.2698%
8112	484	Electronic equipment repair and maintenance	0.2579%
5324	434	Machinery and equipment rental and leasing	0.2301%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.2174%
562	460	Waste management and remediation services	0.2085%
492	399	Couriers and messengers	0.2048%
72111, 72112	479	Hotels and motels- including casino hotels	0.2035%
5617	458	Services to buildings and dwellings	0.2022%
481	391	Air transportation	0.1791%
5142	424	Data processing services	0.1771%
5614	455	Business support services	0.1763%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact 5-Feb-07  
 Implan Model: TB04.iap Copyright MIG 2007  
 Impact Name: 313Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 313  
 NAICS 334510  
 Electromedical  
 Apparatus  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	11.3978%
55	451	Management of companies and enterprises	3.9545%
334510	313	Electromedical apparatus manufacturing	3.0798%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	2.5463%
5413	439	Architectural and engineering services	1.8449%
5133	422	Telecommunications	1.5809%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.5756%
531	431	Real estate	1.4737%
5411	437	Legal services	1.0994%
334111	302	Electronic computer manufacturing	1.0151%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interme	0.9559%
484	394	Truck transportation	0.8494%
5222, 5223	425	Nondepository credit intermediation and related a	0.8387%
5414	440	Specialized design services	0.8111%
5412	438	Accounting and bookkeeping services	0.7682%
2211	30	Power generation and supply	0.6722%
335311	333	Electric power and specialty transformer manufactu	0.6617%
722	481	Food services and drinking places	0.6202%
	499	Other State and local government enterprises	0.6019%
5617	458	Services to buildings and dwellings	0.5394%
32611	172	Plastics packaging materials- film and sheet	0.5034%
			<u>TIER 3</u>
5418	447	Advertising and related services	0.4874%
32613	174	Laminated plastics plate- sheet- and shapes	0.4655%
493	400	Warehousing and storage	0.4551%
54161	444	Management consulting services	0.4479%
523	426	Securities- commodity contracts- investments	0.4152%
23*	43	Maintenance and repair of nonresidential buildings	0.3806%
5613	454	Employment services	0.3777%
32552	162	Adhesive manufacturing	0.3215%
5417	446	Scientific research and development services	0.3135%
334119	305	Other computer peripheral equipment manufacturing	0.3106%
33422	307	Broadcast and wireless communications equipment	0.2807%
8113	485	Commercial machinery repair and maintenance	0.2538%
51111	413	Newspaper publishers	0.2536%
5324	434	Machinery and equipment rental and leasing	0.2387%
72111, 72112	479	Hotels and motels- including casino hotels	0.2374%
481	391	Air transportation	0.2250%
5611	452	Office administrative services	0.2157%
211	19	Oil and gas extraction	0.2098%
5142	424	Data processing services	0.1887%
8112	484	Electronic equipment repair and maintenance	0.1874%
51112	414	Periodical publishers	0.1856%
5131	420	Radio and television broadcasting	0.1778%
492	399	Couriers and messengers	0.1731%
333612, 333613	287	Speed changers and mechanical power transmission e	0.1725%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1719%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact

5-Feb-07

Implan Model: TB04.iap

Copyright MIG 2007

Impact Name: 317Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 317

NAICS 334514

Totalizing Fluid

Meters and

Counting Devices

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	9.1233%
55	451	Management of companies and enterprises	3.8786%
5413	439	Architectural and engineering services	1.9612%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.6027%
334111	302	Electronic computer manufacturing	1.4812%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	1.4744%
531	431	Real estate	1.1350%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interme	0.9616%
484	394	Truck transportation	0.9094%
5133	422	Telecommunications	0.8671%
2211	30	Power generation and supply	0.8294%
332812	246	Metal coating and nonprecious engraving	0.7716%
5222, 5223	425	Nondepository credit intermediation and related a	0.7564%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.6672%
325991	169	Custom compounding of purchased resins	0.6488%
722	481	Food services and drinking places	0.6004%
334513	316	Industrial process variable instruments	0.5522%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4932%
335314	336	Relay and industrial control manufacturing	0.4904%
5411	437	Legal services	0.4858%
541511	441	Custom computer programming services	0.4748%
5412	438	Accounting and bookkeeping services	0.4592%
493	400	Warehousing and storage	0.4503%
523	426	Securities- commodity contracts- investments	0.3747%
5613	454	Employment services	0.3621%
	499	Other State and local government enterprises	0.3347%
32611	172	Plastics packaging materials- film and sheet	0.3185%
5418	447	Advertising and related services	0.3078%
5417	446	Scientific research and development services	0.3017%
8113	485	Commercial machinery repair and maintenance	0.3006%
482	392	Rail transportation	0.2615%
481	391	Air transportation	0.2422%
211	19	Oil and gas extraction	0.2377%
72111, 72112	479	Hotels and motels- including casino hotels	0.2330%
5617	458	Services to buildings and dwellings	0.2253%
492	399	Couriers and messengers	0.2188%
5614	455	Business support services	0.2178%
5241	427	Insurance carriers	0.2159%
5142	424	Data processing services	0.2089%
8112	484	Electronic equipment repair and maintenance	0.2042%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2007%
5611	452	Office administrative services	0.1949%
23*	43	Maintenance and repair of nonresidential buildings	0.1909%
541512	442	Computer systems design services	0.1888%
491110	398	Postal service	0.1822%
5324	434	Machinery and equipment rental and leasing	0.1815%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact

5-Feb-07

Implan Model: TB04.iap

Copyright MIG 2007

Impact Name: 319Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 319

NAICS 334516

Analytical

Laboratory

Instrument

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
5614	455	Business support services	12.5529%
334111	302	Electronic computer manufacturing	5.4367%
42	390	Wholesale trade	4.8324%
55	451	Management of companies and enterprises	3.5785%
531	431	Real estate	1.5995%
5133	422	Telecommunications	1.4907%
5413	439	Architectural and engineering services	1.4114%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	1.3302%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.2703%
			<u>TIER 2: 0.5% - 1%</u>
5411	437	Legal services	0.8994%
521, 5221	430	Monetary authorities and depository credit interme	0.8617%
492	399	Couriers and messengers	0.7835%
5222, 5223	425	Nondepository credit intermediation and related a	0.7491%
2211	30	Power generation and supply	0.6847%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.6537%
5412	438	Accounting and bookkeeping services	0.6028%
5418	447	Advertising and related services	0.5983%
722	481	Food services and drinking places	0.5906%
	499	Other State and local government enterprises	0.5360%
5613	454	Employment services	0.5344%
			<u>TIER 3</u>
523	426	Securities- commodity contracts- investments	0.4623%
484	394	Truck transportation	0.4560%
54161	444	Management consulting services	0.4070%
493	400	Warehousing and storage	0.4058%
541511	441	Custom computer programming services	0.3773%
32612	173	Plastics pipe- fittings- and profile shapes	0.3716%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.3646%
23*	43	Maintenance and repair of nonresidential buildings	0.3427%
51111	413	Newspaper publishers	0.3288%
5617	458	Services to buildings and dwellings	0.3178%
5611	452	Office administrative services	0.3169%
8113	485	Commercial machinery repair and maintenance	0.2903%
5417	446	Scientific research and development services	0.2796%
5619	459	Other support services	0.2662%
211	19	Oil and gas extraction	0.2449%
32611	172	Plastics packaging materials- film and sheet	0.2425%
51112	414	Periodical publishers	0.2417%
33291	248	Metal valve manufacturing	0.2354%
5131	420	Radio and television broadcasting	0.2291%
72111, 72112	479	Hotels and motels- including casino hotels	0.2215%
5324	434	Machinery and equipment rental and leasing	0.2189%
5241	427	Insurance carriers	0.2134%
481	391	Air transportation	0.1981%
5142	424	Data processing services	0.1945%
8112	484	Electronic equipment repair and maintenance	0.1932%
541512	442	Computer svstems desian services	0.1927%



**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact

5-Feb-07

Implan Model: TB04.iap

Copyright MIG 2007

Impact Name: 374Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 374

NAICS 339111

Laboratory Apparatus

and Furniture

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
<u>TIER 1: &gt; 1%</u>			
339111	374	Laboratory apparatus and furniture manufacturing	10.2987%
42	390	Wholesale trade	5.1586%
55	451	Management of companies and enterprises	5.1550%
33791	372	Mattress manufacturing	2.9245%
531	431	Real estate	1.6812%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.3242%
5133	422	Telecommunications	1.1840%
<u>TIER 2: 0.5% - 1%</u>			
2211	30	Power generation and supply	0.9289%
334111	302	Electronic computer manufacturing	0.9023%
484	394	Truck transportation	0.8964%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.8717%
521, 5221	430	Monetary authorities and depository credit interme	0.8450%
5411	437	Legal services	0.8142%
5222, 5223	425	Nondepository credit intermediation and related a	0.8123%
5412	438	Accounting and bookkeeping services	0.7688%
5413	439	Architectural and engineering services	0.7663%
722	481	Food services and drinking places	0.6714%
5418	447	Advertising and related services	0.5423%
	499	Other State and local government enterprises	0.5375%
493	400	Warehousing and storage	0.5350%
<u>TIER 3</u>			
3326	242	Spring and wire product manufacturing	0.4833%
23*	43	Maintenance and repair of nonresidential buildings	0.4731%
54161	444	Management consulting services	0.4546%
332813	247	Electroplating- anodizing- and coloring metal	0.4461%
541511	441	Custom computer programming services	0.4168%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4147%
5417	446	Scientific research and development services	0.3931%
523	426	Securities- commodity contracts- investments	0.3722%
332812	246	Metal coating and nonprecious engraving	0.3528%
5613	454	Employment services	0.3062%
8113	485	Commercial machinery repair and maintenance	0.3021%
51111	413	Newspaper publishers	0.2978%
334513	316	Industrial process variable instruments	0.2929%
32613	174	Laminated plastics plate- sheet- and shapes	0.2914%
211	19	Oil and gas extraction	0.2851%
5324	434	Machinery and equipment rental and leasing	0.2597%
51112	414	Periodical publishers	0.2166%
8112	484	Electronic equipment repair and maintenance	0.2117%
5614	455	Business support services	0.2084%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2038%
5131	420	Radio and television broadcasting	0.2032%
5617	458	Services to buildings and dwellings	0.2017%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.2003%
492	399	Couriers and messengers	0.1995%
72111, 72112	479	Hotels and motels- including casino hotels	0.1981%
5142	424	Data processing services	0.1925%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact 5-Feb-07  
 Implan Model: TB04.iap Copyright MIG 2007  
 Impact Name: 375Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 375  
 NAICS 339112  
 Surgical and  
 Medical Instrument  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	6.6230%
339112	375	Surgical and medical instrument manufacturing	4.5711%
55	451	Management of companies and enterprises	3.8170%
339113	376	Surgical appliance and supplies manufacturing	2.6756%
5411	437	Legal services	1.7643%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.2619%
531	431	Real estate	1.2290%
			<u>TIER 2: 0.5% - 1%</u>
5133	422	Telecommunications	0.8437%
521, 5221	430	Monetary authorities and depository credit interme	0.8303%
2211	30	Power generation and supply	0.7692%
5412	438	Accounting and bookkeeping services	0.7303%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.7056%
5414	440	Specialized design services	0.6682%
32611	172	Plastics packaging materials- film and sheet	0.6637%
5222, 5223	425	Nondepository credit intermediation and related a	0.6560%
484	394	Truck transportation	0.6546%
5413	439	Architectural and engineering services	0.5522%
722	481	Food services and drinking places	0.5284%
	499	Other State and local government enterprises	0.5270%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4749%
32612	173	Plastics pipe- fittings- and profile shapes	0.4723%
493	400	Warehousing and storage	0.4254%
5418	447	Advertising and related services	0.3750%
523	426	Securities- commodity contracts- investments	0.3389%
334510	313	Electromedical apparatus manufacturing	0.3076%
8113	485	Commercial machinery repair and maintenance	0.3051%
5417	446	Scientific research and development services	0.2990%
23*	43	Maintenance and repair of nonresidential buildings	0.2951%
5613	454	Employment services	0.2852%
211	19	Oil and gas extraction	0.2060%
492	399	Couriers and messengers	0.2055%
8112	484	Electronic equipment repair and maintenance	0.2052%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1999%
51111	413	Newspaper publishers	0.1950%
72111, 72112	479	Hotels and motels- including casino hotels	0.1917%
5617	458	Services to buildings and dwellings	0.1914%
5614	455	Business support services	0.1825%
5324	434	Machinery and equipment rental and leasing	0.1808%
5241	427	Insurance carriers	0.1754%
32613	174	Laminated plastics plate- sheet- and shapes	0.1703%
5611	452	Office administrative services	0.1589%
5142	424	Data processing services	0.1458%
51112	414	Periodical publishers	0.1444%
481	391	Air transportation	0.1408%
522	436	Lessors of nonfinancial intangible assets	0.1393%
5131	420	Radio and television broadcasting	0.1350%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact

5-Feb-07

Implan Model: TB04.iap

Copyright MIG 2007

Impact Name: 376Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 376

NAICS 339113

Surgical Appliance  
and Supplies

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	4.5701%
339113	376	Surgical appliance and supplies manufacturing	4.0118%
339112	375	Surgical and medical instrument manufacturing	3.5700%
55	451	Management of companies and enterprises	3.5414%
334510	313	Electromedical apparatus manufacturing	2.4804%
5411	437	Legal services	1.7226%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1994%
531	431	Real estate	1.1649%
5133	422	Telecommunications	1.0826%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interme	0.8097%
484	394	Truck transportation	0.7017%
2211	30	Power generation and supply	0.6646%
5222, 5223	425	Nondepository credit intermediation and related a	0.6386%
5412	438	Accounting and bookkeeping services	0.6098%
5413	439	Architectural and engineering services	0.5093%
32611	172	Plastics packaging materials- film and sheet	0.5077%
			<u>TIER 3</u>
722	481	Food services and drinking places	0.4893%
5418	447	Advertising and related services	0.4602%
54161	444	Management consulting services	0.4196%
523	426	Securities- commodity contracts- investments	0.4177%
493	400	Warehousing and storage	0.3919%
23*	43	Maintenance and repair of nonresidential buildings	0.3704%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.3586%
32612	173	Plastics pipe- fittings- and profile shapes	0.3415%
339116	379	Dental laboratories	0.2835%
5417	446	Scientific research and development services	0.2777%
5613	454	Employment services	0.2551%
51111	413	Newspaper publishers	0.2527%
8113	485	Commercial machinery repair and maintenance	0.2483%
51112	414	Periodical publishers	0.1852%
72111, 72112	479	Hotels and motels- including casino hotels	0.1818%
5324	434	Machinery and equipment rental and leasing	0.1816%
492	399	Couriers and messengers	0.1783%
5617	458	Services to buildings and dwellings	0.1769%
5131	420	Radio and television broadcasting	0.1755%
211	19	Oil and gas extraction	0.1745%
8112	484	Electronic equipment repair and maintenance	0.1736%
5241	427	Insurance carriers	0.1717%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1667%
5614	455	Business support services	0.1639%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.1586%
454	412	Nonstore retailers	0.1494%
481	391	Air transportation	0.1426%
522	436	Lessors of nonfinancial intangible assets	0.1424%
5142	424	Data processing services	0.1411%
32613	174	Laminated plastics plate- sheet- and shapes	0.1374%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact  
 Implan Model: TB04.iap  
 Impact Name: 377Cluster-rpc100

5-Feb-07  
 Copyright MIG 2007  
 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 377  
 NAICS 339114  
 Dental Equipment  
 and Supplies  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	8.0892%
55	451	Management of companies and enterprises	4.8020%
5411	437	Legal services	1.6920%
339116	379	Dental laboratories	1.5074%
531	431	Real estate	1.3991%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.3564%
5133	422	Telecommunications	1.0581%
			<u>TIER 2: 0.5% - 1%</u>
331492	220	Secondary processing of other nonferrous	0.9613%
484	394	Truck transportation	0.9435%
521, 5221	430	Monetary authorities and depository credit interme	0.8612%
2211	30	Power generation and supply	0.8357%
5222, 5223	425	Nondepository credit intermediation and related a	0.8128%
5418	447	Advertising and related services	0.7388%
5412	438	Accounting and bookkeeping services	0.5996%
	499	Other State and local government enterprises	0.5729%
334510	313	Electromedical apparatus manufacturing	0.5161%
493	400	Warehousing and storage	0.5086%
54161	444	Management consulting services	0.5048%
5413	439	Architectural and engineering services	0.5035%
			<u>TIER 3</u>
722	481	Food services and drinking places	0.4906%
523	426	Securities- commodity contracts- investments	0.4797%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4537%
51111	413	Newspaper publishers	0.4056%
23*	43	Maintenance and repair of nonresidential buildings	0.3688%
5417	446	Scientific research and development services	0.3676%
8113	485	Commercial machinery repair and maintenance	0.3529%
5613	454	Employment services	0.3064%
32611	172	Plastics packaging materials- film and sheet	0.3054%
5121	418	Motion picture and video industries	0.2959%
51112	414	Periodical publishers	0.2936%
5131	420	Radio and television broadcasting	0.2915%
482	392	Rail transportation	0.2868%
5324	434	Machinery and equipment rental and leasing	0.2581%
211	19	Oil and gas extraction	0.2559%
8112	484	Electronic equipment repair and maintenance	0.2494%
334516	319	Analytical laboratory instrument manufacturing	0.2480%
32612	173	Plastics pipe- fittings- and profile shapes	0.2432%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2353%
492	399	Couriers and messengers	0.2286%
5614	455	Business support services	0.2280%
72111, 72112	479	Hotels and motels- including casino hotels	0.2091%
5617	458	Services to buildings and dwellings	0.2021%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.1986%
5241	427	Insurance carriers	0.1794%
5142	424	Data processing services	0.1771%
5611	452	Office administrative services	0.1723%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact	5-Feb-07	
Implan Model: TB04.iap	Copyright MIG 2007	Primary Industry:
Impact Name: 378Cluster-rpc100	Type II Multipliers w/ RPC's 100% 1st round	IMPLAN 378

NAICS Sector	IMPLAN Industry	Description	
			Ophthalmic Goods Manufacturing
			<u>TIER 1: &gt; 1%</u>
55	451	Management of companies and enterprises	3.7912%
42	390	Wholesale trade	3.0752%
339115	378	Ophthalmic goods manufacturing	1.9050%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	1.3225%
531	431	Real estate	1.1371%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.0368%
			<u>TIER 2: 0.5% - 1%</u>
5418	447	Advertising and related services	0.9744%
5133	422	Telecommunications	0.8398%
2211	30	Power generation and supply	0.8232%
32611	172	Plastics packaging materials- film and sheet	0.6868%
722	481	Food services and drinking places	0.6799%
521, 5221	430	Monetary authorities and depository credit interme	0.6469%
484	394	Truck transportation	0.5918%
334510	313	Electromedical apparatus manufacturing	0.5876%
5222, 5223	425	Nondepository credit intermediation and related a	0.5862%
5411	437	Legal services	0.5715%
51111	413	Newspaper publishers	0.5382%
5413	439	Architectural and engineering services	0.5219%
			<u>TIER 3</u>
32612	173	Plastics pipe- fittings- and profile shapes	0.4572%
5412	438	Accounting and bookkeeping services	0.4137%
491110	398	Postal service	0.4049%
493	400	Warehousing and storage	0.4036%
51112	414	Periodical publishers	0.4034%
8113	485	Commercial machinery repair and maintenance	0.4027%
5131	420	Radio and television broadcasting	0.3783%
54161	444	Management consulting services	0.3585%
5121	418	Motion picture and video industries	0.3122%
5619	459	Other support services	0.3072%
	499	Other State and local government enterprises	0.3057%
5417	446	Scientific research and development services	0.2953%
523	426	Securities- commodity contracts- investments	0.2717%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2578%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.2548%
23*	43	Maintenance and repair of nonresidential buildings	0.2528%
5241	427	Insurance carriers	0.2515%
8112	484	Electronic equipment repair and maintenance	0.2514%
5613	454	Employment services	0.2451%
211	19	Oil and gas extraction	0.2098%
32613	174	Laminated plastics plate- sheet- and shapes	0.1758%
5324	434	Machinery and equipment rental and leasing	0.1697%
5617	458	Services to buildings and dwellings	0.1570%
492	399	Couriers and messengers	0.1506%
72111, 72112	479	Hotels and motels- including casino hotels	0.1499%
5614	455	Business support services	0.1384%
5142	424	Data processing services	0.1311%
522	436	Lessors of nonfinancial intangible assets	0.1279%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact 5-Feb-07  
 Implan Model: TB04.iap Copyright MIG 2007  
 Impact Name: 385Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 385  
 NAICS 339991  
 Gasket, Packing,  
 and Sealing Device  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	3.2239%
55	451	Management of companies and enterprises	1.9188%
484	394	Truck transportation	1.6538%
2211	30	Power generation and supply	1.2074%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.0353%
			<u>TIER 2: 0.5% - 1%</u>
531	431	Real estate	0.9267%
32552	162	Adhesive manufacturing	0.9161%
521, 5221	430	Monetary authorities and depository credit interme	0.6454%
5133	422	Telecommunications	0.6200%
5222, 5223	425	Nondepository credit intermediation and related a	0.5502%
			<u>TIER 3</u>
722	481	Food services and drinking places	0.4849%
5411	437	Legal services	0.4711%
5413	439	Architectural and engineering services	0.4323%
482	392	Rail transportation	0.4160%
8113	485	Commercial machinery repair and maintenance	0.3719%
5412	438	Accounting and bookkeeping services	0.3712%
523	426	Securities- commodity contracts- investments	0.3623%
54161	444	Management consulting services	0.3443%
23*	43	Maintenance and repair of nonresidential buildings	0.3362%
211	19	Oil and gas extraction	0.3246%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2546%
487, 488	397	Scenic and sightseeing transportation and support	0.2458%
562	460	Waste management and remediation services	0.2349%
8112	484	Electronic equipment repair and maintenance	0.2100%
5613	454	Employment services	0.2043%
5241	427	Insurance carriers	0.1869%
5418	447	Advertising and related services	0.1867%
	498	State and local government electric utilities	0.1732%
5324	434	Machinery and equipment rental and leasing	0.1717%
493	400	Warehousing and storage	0.1691%
	499	Other State and local government enterprises	0.1559%
492	399	Couriers and messengers	0.1472%
72111, 72112	479	Hotels and motels- including casino hotels	0.1460%
5617	458	Services to buildings and dwellings	0.1376%
491110	398	Postal service	0.1351%
5614	455	Business support services	0.1238%
325212	153	Synthetic rubber manufacturing	0.1203%
481	391	Air transportation	0.1176%
522	436	Lessors of nonfinancial intangible assets	0.1088%
5611	452	Office administrative services	0.1066%
5321	432	Automotive equipment rental and leasing	0.1059%
51111	413	Newspaper publishers	0.1024%
8114	486	Household goods repair and maintenance	0.1021%
33271	243	Machine shops	0.1016%
5142	424	Data processing services	0.1003%
5417	446	Scientific research and development services	0.0978%

**Indirect Output Effect in Tampa Bay resulting from a change to Direct Output for Primary Industry**

Output Impact	21-Mar-07	Average of	
Implan Model: TB04.iap	Copyright MIG 2007	Primary Industries:	
Impact Name: AvgEXCL108320321379-Cluster-rpc100	Type II Multipliers w/ RPC's 100% 1st round	IMPLAN 160, 181	
		271, 313, 317, 319,	
		374, 375, 376, 377	
		378, 385, & 446	
		(EXCL. 108, 320, 321, & 379)	
NAICS	IMPLAN		
Sector	Industry	Description	
		TIER 1: > 1%	
42	390	Wholesale trade	5.8407%
55	451	Management of companies and enterprises	3.8321%
531	431	Real estate	1.5500%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.4533%
5614	455	Business support services	1.2295%
5411	437	Legal services	1.1404%
5133	422	Telecommunications	1.0763%
334111	302	Electronic computer manufacturing	1.0227%
			TIER 2: 0.5% - 1%
32541	160	Pharmaceutical and medicine manufacturing	0.9909%
5413	439	Architectural and engineering services	0.8984%
2211	30	Power generation and supply	0.8933%
339111	374	Laboratory apparatus and furniture manufacturing	0.8601%
521, 5221	430	Monetary authorities and depository credit interme	0.8245%
484	394	Truck transportation	0.7768%
5222, 5223	425	Nondepository credit intermediation and related a	0.7224%
339112	375	Surgical and medical instrument manufacturing	0.6897%
5412	438	Accounting and bookkeeping services	0.6644%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.6520%
334510	313	Electromedical apparatus manufacturing	0.6149%
722	481	Food services and drinking places	0.5693%
5418	447	Advertising and related services	0.5668%
339113	376	Surgical appliance and supplies manufacturing	0.5602%
54161	444	Management consulting services	0.5194%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.5157%
			TIER 3
5613	454	Employment services	0.4716%
493	400	Warehousing and storage	0.4358%
	499	Other State and local government enterprises	0.4061%
23*	43	Maintenance and repair of nonresidential buildings	0.3908%
523	426	Securities- commodity contracts- investments	0.3740%
32611	172	Plastics packaging materials- film and sheet	0.3405%
8113	485	Commercial machinery repair and maintenance	0.3342%
5417	446	Scientific research and development services	0.3114%
51111	413	Newspaper publishers	0.3109%
5617	458	Services to buildings and dwellings	0.3078%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.3071%
5611	452	Office administrative services	0.2748%
211	19	Oil and gas extraction	0.2723%
492	399	Couriers and messengers	0.2472%
33791	372	Mattress manufacturing	0.2438%
51112	414	Periodical publishers	0.2408%
522	436	Lessors of nonfinancial intangible assets	0.2267%
8112	484	Electronic equipment repair and maintenance	0.2210%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2210%
5324	434	Machinery and equipment rental and leasing	0.2206%
5131	420	Radio and television broadcasting	0.2165%
32612	173	Plastics pipe- fittings- and profile shapes	0.2151%

## Appendix C

### Detailed Rankings of Supplier-Industries of the Medical Products Industry Group in Florida

This section presents the detailed results of the cluster analysis in Florida using IMPLAN. We analyzed each primary industry to determine the supplier-industries that combine to form the cluster in the region. To do this, we injected a theoretical \$100 million increase in output in each primary industry. The result of this economic shock was to produce a theoretical increase in indirect output for each industry associated with the primary industry. The extent of indirect output effect for each primary industry is depicted in the following tables listing supplier-industries ranked from highest to lowest percentage of direct impact for the first 50+/- indirectly affected industries. The results are ranked in three tiers – Tier 1 supplier-industries are those in which the indirect effect is greater than 1% of the theoretical direct impact. Tier 2 supplier-industries are those in which the indirect effect is between 0.5% and 1% of the direct impact. And, Tier 3 supplier-industries are those in which the indirect effect is less than 0.5% of the direct impact. We then analyze the Tier 1 supplier-industries to ascertain whether there is any consistency from one primary industry to another. The results of this analysis are presented in Table 3 in the body of the text above.



**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 160Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 160

NAICS 32541

Pharmaceutical

and Medicine

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
32541	160	Pharmaceutical and medicine manufacturing	10.5094%
42	390	Wholesale trade	6.4856%
55	451	Management of companies and enterprises	6.3502%
54191, 54193, 54199	450	All other miscellaneous professional and technical	2.2148%
522	436	Lessors of nonfinancial intangible assets	1.8402%
531	431	Real estate	1.1290%
			<u>TIER 2: 0.5% - 1%</u>
5411	437	Legal services	0.9966%
521, 5221	430	Monetary authorities and depository credit interme	0.9472%
5418	447	Advertising and related services	0.9454%
5417	446	Scientific research and development services	0.9161%
493	400	Warehousing and storage	0.9063%
5133	422	Telecommunications	0.8702%
2211	30	Power generation and supply	0.7466%
5412	438	Accounting and bookkeeping services	0.7462%
5222, 5223	425	Nondepository credit intermediation and related a	0.6593%
5131	420	Radio and television broadcasting	0.6500%
54161	444	Management consulting services	0.5921%
484	394	Truck transportation	0.5860%
722	481	Food services and drinking places	0.5311%
51111	413	Newspaper publishers	0.5032%
			<u>TIER 3</u>
5413	439	Architectural and engineering services	0.4891%
5121	418	Motion picture and video industries	0.4026%
32616	175	Plastics bottle manufacturing	0.3621%
5613	454	Employment services	0.3551%
6112, 6113	462	Colleges- universities- and junior colleges	0.3315%
8113	485	Commercial machinery repair and maintenance	0.3181%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.2741%
8112	484	Electronic equipment repair and maintenance	0.2725%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.2700%
5142	424	Data processing services	0.2568%
32611	172	Plastics packaging materials- film and sheet	0.2556%
492	399	Couriers and messengers	0.2432%
325998	171	Other miscellaneous chemical product manufacturing	0.2396%
32512	148	Industrial gas manufacturing	0.2388%
523	426	Securities- commodity contracts- investments	0.2320%
5617	458	Services to buildings and dwellings	0.2312%
562	460	Waste management and remediation services	0.2280%
5132	421	Cable networks and program distribution	0.2216%
72111, 72112	479	Hotels and motels- including casino hotels	0.2164%
211	19	Oil and gas extraction	0.2152%
51112	414	Periodical publishers	0.2102%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2058%
5614	455	Business support services	0.2055%
	498	State and local government electric utilities	0.1986%
5611	452	Office administrative services	0.1942%
	499	Other State and local government enterprises	0.1790%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact  
 Implan Model: FL04.iap  
 Impact Name: 446Cluster-rpc100

14-Feb-07  
 Copyright MIG 2007  
 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 446  
 NAICS 5417  
 Scientific Research  
 and Development  
 Services

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
531	431	Real estate	3.6671%
5411	437	Legal services	1.9288%
5613	454	Employment services	1.8606%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.8401%
42	390	Wholesale trade	1.5166%
5133	422	Telecommunications	1.1844%
5611	452	Office administrative services	1.1636%
54161	444	Management consulting services	1.1172%
5413	439	Architectural and engineering services	1.0816%
327211, 327212, 327215	190	Glass and glass products- except glass containers	1.0625%
			<u>TIER 2: 0.5% - 1%</u>
5617	458	Services to buildings and dwellings	0.9733%
2211	30	Power generation and supply	0.8667%
5412	438	Accounting and bookkeeping services	0.6532%
5222, 5223	425	Nondepository credit intermediation and related a	0.5998%
521, 5221	430	Monetary authorities and depository credit interme	0.5864%
722	481	Food services and drinking places	0.5431%
55	451	Management of companies and enterprises	0.5117%
			<u>TIER 3</u>
491110	398	Postal service	0.4209%
8113	485	Commercial machinery repair and maintenance	0.3917%
523	426	Securities- commodity contracts- investments	0.3807%
	499	Other State and local government enterprises	0.3631%
23*	43	Maintenance and repair of nonresidential buildings	0.3527%
5614	455	Business support services	0.3432%
5324	434	Machinery and equipment rental and leasing	0.3327%
484	394	Truck transportation	0.2985%
5321	432	Automotive equipment rental and leasing	0.2932%
325612	164	Polish and other sanitation good manufacturing	0.2882%
5418	447	Advertising and related services	0.2790%
5619	459	Other support services	0.2674%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2573%
541512	442	Computer systems design services	0.2526%
8134, 8139	493	Civic- social- professional and similar organizati	0.2334%
	498	State and local government electric utilities	0.2332%
72111, 72112	479	Hotels and motels- including casino hotels	0.2291%
8112	484	Electronic equipment repair and maintenance	0.2246%
5616	457	Investigation and security services	0.2238%
541513, 541519	443	Other computer related services- including facilit	0.2151%
51112	414	Periodical publishers	0.2150%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.2086%
492	399	Couriers and messengers	0.2015%
5241	427	Insurance carriers	0.1979%
5142	424	Data processing services	0.1965%
5131	420	Radio and television broadcasting	0.1855%
334413	311	Semiconductors and related device manufacturing	0.1681%
51111	413	Newspaper publishers	0.1640%
481	391	Air transportation	0.1581%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 181Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 181

NAICS 32629

Other Rubber

Product

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	4.0276%
55	451	Management of companies and enterprises	2.4506%
484	394	Truck transportation	2.0112%
5413	439	Architectural and engineering services	1.1517%
2211	30	Power generation and supply	1.1109%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1048%
			<u>TIER 2: 0.5% - 1%</u>
531	431	Real estate	0.8371%
521, 5221	430	Monetary authorities and depository credit interne	0.6739%
5222, 5223	425	Nondepository credit intermediation and related a	0.5630%
5133	422	Telecommunications	0.5375%
8113	485	Commercial machinery repair and maintenance	0.5119%
			<u>TIER 3</u>
32519	151	Other basic organic chemical manufacturing	0.4841%
722	481	Food services and drinking places	0.4665%
482	392	Rail transportation	0.4369%
5411	437	Legal services	0.3896%
54161	444	Management consulting services	0.3851%
5412	438	Accounting and bookkeeping services	0.3734%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.3474%
334413	311	Semiconductors and related device manufacturing	0.3269%
	498	State and local government electric utilities	0.3004%
8112	484	Electronic equipment repair and maintenance	0.2945%
5613	454	Employment services	0.2412%
31331	97	Textile and fabric finishing mills	0.2277%
21239	26	Other nonmetallic mineral mining	0.2261%
523	426	Securities- commodity contracts- investments	0.2213%
5418	447	Advertising and related services	0.2164%
493	400	Warehousing and storage	0.2152%
562	460	Waste management and remediation services	0.2073%
5324	434	Machinery and equipment rental and leasing	0.2061%
487, 488	397	Scenic and sightseeing transportation and support	0.1903%
211	19	Oil and gas extraction	0.1881%
5321	432	Automotive equipment rental and leasing	0.1820%
5241	427	Insurance carriers	0.1806%
491110	398	Postal service	0.1731%
492	399	Couriers and messengers	0.1650%
5417	446	Scientific research and development services	0.1636%
72111, 72112	479	Hotels and motels- including casino hotels	0.1632%
	499	Other State and local government enterprises	0.1612%
5617	458	Services to buildings and dwellings	0.1593%
5131	420	Radio and television broadcasting	0.1429%
481	391	Air transportation	0.1394%
8114	486	Household goods repair and maintenance	0.1380%
5614	455	Business support services	0.1362%
32611	172	Plastics packaging materials- film and sheet	0.1357%
23*	43	Maintenance and repair of nonresidential buildings	0.1330%
5611	452	Office administrative services	0.1282%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 271Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 271

NAICS 333314

Optical Instrument  
and Lens

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	5.4239%
55	451	Management of companies and enterprises	4.3411%
327211, 327212, 327215	190	Glass and glass products- except glass containers	2.6403%
334111	302	Electronic computer manufacturing	2.1324%
531	431	Real estate	1.5067%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.3751%
334413	311	Semiconductors and related device manufacturing	1.3023%
5412	438	Accounting and bookkeeping services	1.0557%
5133	422	Telecommunications	1.0098%
333319	273	Other commercial and service industry machinery ma	1.0072%
			<u>TIER 2: 0.5% - 1%</u>
2211	30	Power generation and supply	0.9278%
5411	437	Legal services	0.9098%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.8530%
521, 5221	430	Monetary authorities and depository credit interme	0.8338%
5418	447	Advertising and related services	0.7752%
484	394	Truck transportation	0.7411%
5222, 5223	425	Nondepository credit intermediation and related a	0.6895%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.6863%
	499	Other State and local government enterprises	0.5423%
5413	439	Architectural and engineering services	0.5325%
5131	420	Radio and television broadcasting	0.5087%
			<u>TIER 3</u>
722	481	Food services and drinking places	0.4973%
54161	444	Management consulting services	0.4890%
493	400	Warehousing and storage	0.4768%
5417	446	Scientific research and development services	0.4460%
8113	485	Commercial machinery repair and maintenance	0.4175%
51111	413	Newspaper publishers	0.4093%
523	426	Securities- commodity contracts- investments	0.3876%
541511	441	Custom computer programming services	0.3873%
5613	454	Employment services	0.2995%
33291	248	Metal valve manufacturing	0.2812%
32612	173	Plastics pipe- fittings- and profile shapes	0.2776%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2703%
8112	484	Electronic equipment repair and maintenance	0.2697%
	498	State and local government electric utilities	0.2527%
325991	169	Custom compounding of purchased resins	0.2369%
5324	434	Machinery and equipment rental and leasing	0.2257%
5321	432	Automotive equipment rental and leasing	0.2115%
5142	424	Data processing services	0.2026%
72111, 72112	479	Hotels and motels- including casino hotels	0.2021%
492	399	Couriers and messengers	0.2020%
562	460	Waste management and remediation services	0.2017%
5617	458	Services to buildings and dwellings	0.2008%
23*	43	Maintenance and repair of nonresidential buildings	0.2001%
5132	421	Cable networks and program distribution	0.1842%
481	391	Air transportation	0.1760%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 313Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 313

NAICS 334510

Electromedical

Apparatus

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	11.3529%
55	451	Management of companies and enterprises	3.9302%
334510	313	Electromedical apparatus manufacturing	3.0181%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	2.3683%
5413	439	Architectural and engineering services	1.8239%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.5638%
5133	422	Telecommunications	1.5465%
531	431	Real estate	1.4683%
5411	437	Legal services	1.0967%
334413	311	Semiconductors and related device manufacturing	1.0158%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interme	0.9510%
334113	304	Computer terminal manufacturing	0.9378%
484	394	Truck transportation	0.8454%
5414	440	Specialized design services	0.8081%
5222, 5223	425	Nondepository credit intermediation and related a	0.7716%
5412	438	Accounting and bookkeeping services	0.7527%
334111	302	Electronic computer manufacturing	0.6855%
722	481	Food services and drinking places	0.6152%
	499	Other State and local government enterprises	0.5969%
2211	30	Power generation and supply	0.5393%
5617	458	Services to buildings and dwellings	0.5381%
			<u>TIER 3</u>
5418	447	Advertising and related services	0.4755%
54161	444	Management consulting services	0.4560%
493	400	Warehousing and storage	0.4536%
523	426	Securities- commodity contracts- investments	0.4466%
5417	446	Scientific research and development services	0.4177%
5613	454	Employment services	0.3783%
335311	333	Electric power and specialty transformer manufactu	0.3689%
5131	420	Radio and television broadcasting	0.3038%
33422	307	Broadcast and wireless communications equipment	0.3005%
32611	172	Plastics packaging materials- film and sheet	0.2933%
334119	305	Other computer peripheral equipment manufacturing	0.2720%
325998	171	Other miscellaneous chemical product manufacturing	0.2660%
8113	485	Commercial machinery repair and maintenance	0.2551%
51111	413	Newspaper publishers	0.2380%
72111, 72112	479	Hotels and motels- including casino hotels	0.2375%
5324	434	Machinery and equipment rental and leasing	0.2370%
481	391	Air transportation	0.2250%
5142	424	Data processing services	0.2202%
5611	452	Office administrative services	0.2166%
5321	432	Automotive equipment rental and leasing	0.2161%
8112	484	Electronic equipment repair and maintenance	0.1966%
23*	43	Maintenance and repair of nonresidential buildings	0.1766%
492	399	Couriers and messengers	0.1728%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1728%
32613	174	Laminated plastics plate- sheet- and shapes	0.1713%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 317Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 317

NAICS 334514

Totalizing Fluid  
Meters and  
Counting Devices

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	8.8830%
55	451	Management of companies and enterprises	3.8094%
325991	169	Custom compounding of purchased resins	2.1399%
334413	311	Semiconductors and related device manufacturing	2.1311%
5413	439	Architectural and engineering services	1.9245%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.5813%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	1.3291%
531	431	Real estate	1.1224%
			<u>TIER 2: 0.5% - 1%</u>
334111	302	Electronic computer manufacturing	0.9761%
521, 5221	430	Monetary authorities and depository credit interme	0.9524%
484	394	Truck transportation	0.9423%
5133	422	Telecommunications	0.8439%
5222, 5223	425	Nondepository credit intermediation and related a	0.7004%
2211	30	Power generation and supply	0.6708%
332812	246	Metal coating and nonprecious engraving	0.6317%
722	481	Food services and drinking places	0.5909%
5411	437	Legal services	0.5020%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4991%
541511	441	Custom computer programming services	0.4690%
334513	316	Industrial process variable instruments	0.4544%
5412	438	Accounting and bookkeeping services	0.4470%
493	400	Warehousing and storage	0.4445%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4397%
334514	317	Totalizing fluid meters and counting devices	0.4209%
335314	336	Relay and industrial control manufacturing	0.4075%
5417	446	Scientific research and development services	0.4028%
523	426	Securities- commodity contracts- investments	0.4018%
5613	454	Employment services	0.3599%
	499	Other State and local government enterprises	0.3316%
8113	485	Commercial machinery repair and maintenance	0.3085%
5418	447	Advertising and related services	0.3006%
482	392	Rail transportation	0.2484%
5142	424	Data processing services	0.2387%
481	391	Air transportation	0.2375%
72111, 72112	479	Hotels and motels- including casino hotels	0.2313%
5617	458	Services to buildings and dwellings	0.2242%
8112	484	Electronic equipment repair and maintenance	0.2170%
492	399	Couriers and messengers	0.2168%
5241	427	Insurance carriers	0.2149%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2064%
5131	420	Radio and television broadcasting	0.2053%
5614	455	Business support services	0.2047%
5611	452	Office administrative services	0.1941%
541512	442	Computer systems design services	0.1931%
32611	172	Plastics packaging materials- film and sheet	0.1820%
	498	State and local government electric utilities	0.1804%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Primary Industry:

Impact Name: 319Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

IMPLAN 319

NAICS 334516

Analytical Laboratory

Instrument

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
5614	455	Business support services	12.2619%
42	390	Wholesale trade	4.6864%
334111	302	Electronic computer manufacturing	3.5752%
55	451	Management of companies and enterprises	3.5644%
334413	311	Semiconductors and related device manufacturing	1.7182%
531	431	Real estate	1.6016%
5133	422	Telecommunications	1.4635%
5413	439	Architectural and engineering services	1.4176%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.2669%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	1.1841%
			<u>TIER 2: 0.5% - 1%</u>
5411	437	Legal services	0.9075%
521, 5221	430	Monetary authorities and depository credit interne	0.8636%
492	399	Couriers and messengers	0.7761%
5222, 5223	425	Nondepository credit intermediation and related a	0.6860%
5412	438	Accounting and bookkeeping services	0.5942%
722	481	Food services and drinking places	0.5891%
5418	447	Advertising and related services	0.5864%
2211	30	Power generation and supply	0.5580%
5613	454	Employment services	0.5398%
	499	Other State and local government enterprises	0.5318%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.5124%
			<u>TIER 3</u>
523	426	Securities- commodity contracts- investments	0.4964%
484	394	Truck transportation	0.4628%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4423%
54161	444	Management consulting services	0.4192%
493	400	Warehousing and storage	0.4067%
5131	420	Radio and television broadcasting	0.3937%
541511	441	Custom computer programming services	0.3843%
5619	459	Other support services	0.3814%
5417	446	Scientific research and development services	0.3786%
5617	458	Services to buildings and dwellings	0.3205%
5611	452	Office administrative services	0.3199%
334515	318	Electricity and signal testing instruments	0.3143%
51111	413	Newspaper publishers	0.3100%
8113	485	Commercial machinery repair and maintenance	0.2995%
32612	173	Plastics pipe- fittings- and profile shapes	0.2791%
5142	424	Data processing services	0.2261%
72111, 72112	479	Hotels and motels- including casino hotels	0.2235%
325991	169	Custom compounding of purchased resins	0.2219%
5324	434	Machinery and equipment rental and leasing	0.2196%
5241	427	Insurance carriers	0.2143%
5321	432	Automotive equipment rental and leasing	0.2104%
8112	484	Electronic equipment repair and maintenance	0.2070%
481	391	Air transportation	0.1974%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1964%
541512	442	Computer systems design services	0.1957%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact  
 Implan Model: FL04.iap  
 Impact Name: 374Cluster-rpc100

14-Feb-07  
 Copyright MIG 2007  
 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 374  
 NAICS 339111  
 Laboratory Apparatus  
 and Furniture  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
339111	374	Laboratory apparatus and furniture manufacturing	9.7292%
55	451	Management of companies and enterprises	4.9025%
42	390	Wholesale trade	4.8991%
33791	372	Mattress manufacturing	2.7171%
531	431	Real estate	1.5997%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.2655%
5133	422	Telecommunications	1.1049%
334413	311	Semiconductors and related device manufacturing	1.0885%
			<u>TIER 2: 0.5% - 1%</u>
484	394	Truck transportation	0.8681%
521, 5221	430	Monetary authorities and depository credit interme	0.8090%
5411	437	Legal services	0.7802%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.7730%
5413	439	Architectural and engineering services	0.7377%
5412	438	Accounting and bookkeeping services	0.7204%
2211	30	Power generation and supply	0.7155%
5222, 5223	425	Nondepository credit intermediation and related a	0.7078%
722	481	Food services and drinking places	0.6377%
334111	302	Electronic computer manufacturing	0.5802%
	499	Other State and local government enterprises	0.5121%
493	400	Warehousing and storage	0.5115%
5418	447	Advertising and related services	0.5029%
5417	446	Scientific research and development services	0.5014%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4440%
332813	247	Electroplating- anodizing- and coloring metal	0.4388%
321211, 321212	115	Veneer and plywood manufacturing	0.4245%
3326	242	Spring and wire product manufacturing	0.4194%
541511	441	Custom computer programming services	0.4029%
523	426	Securities- commodity contracts- investments	0.3825%
5131	420	Radio and television broadcasting	0.3308%
8113	485	Commercial machinery repair and maintenance	0.2951%
5613	454	Employment services	0.2947%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.2837%
332812	246	Metal coating and nonprecious engraving	0.2817%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.2692%
51111	413	Newspaper publishers	0.2656%
5324	434	Machinery and equipment rental and leasing	0.2460%
5321	432	Automotive equipment rental and leasing	0.2238%
8112	484	Electronic equipment repair and maintenance	0.2150%
5142	424	Data processing services	0.2135%
23*	43	Maintenance and repair of nonresidential buildings	0.2103%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1990%
5617	458	Services to buildings and dwellings	0.1941%
72111, 72112	479	Hotels and motels- including casino hotels	0.1908%
492	399	Couriers and messengers	0.1906%
	498	State and local government electric utilities	0.1888%
334411	310	Electron tube manufacturing	0.1848%



**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact 14-Feb-07  
 Implan Model: FL04.iap Copyright MIG 2007  
 Impact Name: 375Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 375  
 NAICS 339112  
 Surgical and  
 Medical Instrument  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	6.3842%
339112	375	Surgical and medical instrument manufacturing	4.5619%
55	451	Management of companies and enterprises	3.6729%
339113	376	Surgical appliance and supplies manufacturing	1.8506%
5411	437	Legal services	1.6972%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.2208%
531	431	Real estate	1.1867%
334413	311	Semiconductors and related device manufacturing	1.1389%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interne	0.8044%
5133	422	Telecommunications	0.7972%
5412	438	Accounting and bookkeeping services	0.6914%
5414	440	Specialized design services	0.6477%
484	394	Truck transportation	0.6367%
2211	30	Power generation and supply	0.5982%
5222, 5223	425	Nondepository credit intermediation and related a	0.5859%
5413	439	Architectural and engineering services	0.5371%
	499	Other State and local government enterprises	0.5097%
722	481	Food services and drinking places	0.5075%
			<u>TIER 3</u>
54161	444	Management consulting services	0.4688%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.4668%
337125, 337129	367	Other household and institutional furniture	0.4497%
493	400	Warehousing and storage	0.4109%
5417	446	Scientific research and development services	0.3869%
32611	172	Plastics packaging materials- film and sheet	0.3745%
5418	447	Advertising and related services	0.3538%
523	426	Securities- commodity contracts- investments	0.3532%
32612	173	Plastics pipe- fittings- and profile shapes	0.3416%
8113	485	Commercial machinery repair and maintenance	0.2994%
5613	454	Employment services	0.2780%
5131	420	Radio and television broadcasting	0.2232%
8112	484	Electronic equipment repair and maintenance	0.2101%
334510	313	Electromedical apparatus manufacturing	0.2018%
31331	97	Textile and fabric finishing mills	0.2008%
492	399	Couriers and messengers	0.1991%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1961%
5617	458	Services to buildings and dwellings	0.1862%
72111, 72112	479	Hotels and motels- including casino hotels	0.1862%
51111	413	Newspaper publishers	0.1771%
5614	455	Business support services	0.1746%
5324	434	Machinery and equipment rental and leasing	0.1739%
5241	427	Insurance carriers	0.1711%
5142	424	Data processing services	0.1651%
522	436	Lessors of nonfinancial intangible assets	0.1647%
	498	State and local government electric utilities	0.1646%
5321	432	Automotive equipment rental and leasing	0.1607%
5611	452	Office administrative services	0.1555%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 376Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 376

NAICS 339113

Surgical Appliance  
and Supplies  
Manufacturing

NAICS Sector	IMPLAN Industry	Description	TIER 1: > 1%
42	390	Wholesale trade	4.5526%
339112	375	Surgical and medical instrument manufacturing	3.7496%
55	451	Management of companies and enterprises	3.5244%
339113	376	Surgical appliance and supplies manufacturing	2.9268%
334510	313	Electromedical apparatus manufacturing	2.3800%
5411	437	Legal services	1.7139%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1975%
531	431	Real estate	1.1610%
5133	422	Telecommunications	1.0582%
			<hr/>
			TIER 2: 0.5% - 1%
521, 5221	430	Monetary authorities and depository credit interme	0.8100%
334413	311	Semiconductors and related device manufacturing	0.7406%
484	394	Truck transportation	0.7058%
5412	438	Accounting and bookkeeping services	0.5965%
5222, 5223	425	Nondepository credit intermediation and related a	0.5861%
2211	30	Power generation and supply	0.5328%
5413	439	Architectural and engineering services	0.5077%
			<hr/>
			TIER 3
722	481	Food services and drinking places	0.4863%
5418	447	Advertising and related services	0.4485%
523	426	Securities- commodity contracts- investments	0.4478%
54161	444	Management consulting services	0.4276%
493	400	Warehousing and storage	0.3915%
5417	446	Scientific research and development services	0.3700%
5131	420	Radio and television broadcasting	0.2999%
32611	172	Plastics packaging materials- film and sheet	0.2971%
339116	379	Dental laboratories	0.2721%
32612	173	Plastics pipe- fittings- and profile shapes	0.2565%
5613	454	Employment services	0.2562%
8113	485	Commercial machinery repair and maintenance	0.2514%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.2445%
51111	413	Newspaper publishers	0.2370%
31331	97	Textile and fabric finishing mills	0.2336%
8112	484	Electronic equipment repair and maintenance	0.1832%
72111, 72112	479	Hotels and motels- including casino hotels	0.1823%
5324	434	Machinery and equipment rental and leasing	0.1799%
492	399	Couriers and messengers	0.1783%
5617	458	Services to buildings and dwellings	0.1774%
522	436	Lessors of nonfinancial intangible assets	0.1729%
23*	43	Maintenance and repair of nonresidential buildings	0.1725%
31323	95	Nonwoven fabric mills	0.1721%
5241	427	Insurance carriers	0.1716%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1687%
5321	432	Automotive equipment rental and leasing	0.1659%
5142	424	Data processing services	0.1649%
5614	455	Business support services	0.1616%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.1497%
	498	State and local government electric utilities	0.1454%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact 14-Feb-07  
 Implan Model: FL04.iap Copyright MIG 2007  
 Impact Name: 377Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 377  
 NAICS 339114  
 Dental Equipment  
 and Supplies  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	6.7488%
55	451	Management of companies and enterprises	4.0724%
21222, 21229	23	Gold- silver- and other metal ore mining	1.4445%
5411	437	Legal services	1.4316%
339116	379	Dental laboratories	1.2265%
531	431	Real estate	1.1824%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1448%
			<u>TIER 2: 0.5% - 1%</u>
334413	311	Semiconductors and related device manufacturing	0.9284%
5133	422	Telecommunications	0.8720%
484	394	Truck transportation	0.7828%
521, 5221	430	Monetary authorities and depository credit interne	0.7322%
5222, 5223	425	Nondepository credit intermediation and related a	0.6281%
5418	447	Advertising and related services	0.6103%
2211	30	Power generation and supply	0.5861%
			<u>TIER 3</u>
5412	438	Accounting and bookkeeping services	0.4954%
	499	Other State and local government enterprises	0.4862%
5413	439	Architectural and engineering services	0.4427%
523	426	Securities- commodity contracts- investments	0.4421%
54161	444	Management consulting services	0.4354%
493	400	Warehousing and storage	0.4318%
5131	420	Radio and television broadcasting	0.4215%
5417	446	Scientific research and development services	0.4168%
722	481	Food services and drinking places	0.4160%
339114	377	Dental equipment and supplies manufacturing	0.4082%
334510	313	Electromedical apparatus manufacturing	0.3741%
51111	413	Newspaper publishers	0.3221%
8113	485	Commercial machinery repair and maintenance	0.2987%
5121	418	Motion picture and video industries	0.2771%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.2617%
5613	454	Employment services	0.2606%
32519	151	Other basic organic chemical manufacturing	0.2347%
8112	484	Electronic equipment repair and maintenance	0.2209%
5324	434	Machinery and equipment rental and leasing	0.2196%
482	392	Rail transportation	0.2186%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.2029%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.1990%
334517	320	Irradiation apparatus manufacturing	0.1963%
5321	432	Automotive equipment rental and leasing	0.1950%
492	399	Couriers and messengers	0.1926%
72111, 72112	479	Hotels and motels- including casino hotels	0.1774%
5142	424	Data processing services	0.1753%
5614	455	Business support services	0.1731%
5617	458	Services to buildings and dwellings	0.1722%
331419	215	Primary nonferrous metal- except copper and alumin	0.1612%
	498	State and local government electric utilities	0.1603%
331492	220	Secondary processing of other nonferrous	0.1595%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact

14-Feb-07

Implan Model: FL04.iap

Copyright MIG 2007

Impact Name: 378Cluster-rpc100

Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:

IMPLAN 378

NAICS 339115

Ophthalmic

Goods

Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
55	451	Management of companies and enterprises	3.8588%
42	390	Wholesale trade	3.1041%
339115	378	Ophthalmic goods manufacturing	1.9451%
531	431	Real estate	1.1554%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.0521%
			<u>TIER 2: 0.5% - 1%</u>
5418	447	Advertising and related services	0.9749%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.9289%
5133	422	Telecommunications	0.8283%
722	481	Food services and drinking places	0.6898%
2211	30	Power generation and supply	0.6658%
5131	420	Radio and television broadcasting	0.6632%
521, 5221	430	Monetary authorities and depository credit interme	0.6579%
334510	313	Electromedical apparatus manufacturing	0.5955%
484	394	Truck transportation	0.5946%
5411	437	Legal services	0.5774%
5222, 5223	425	Nondepository credit intermediation and related a	0.5472%
5413	439	Architectural and engineering services	0.5299%
51111	413	Newspaper publishers	0.5182%
			<u>TIER 3</u>
5619	459	Other support services	0.4358%
493	400	Warehousing and storage	0.4120%
32611	172	Plastics packaging materials- film and sheet	0.4110%
491110	398	Postal service	0.4107%
8113	485	Commercial machinery repair and maintenance	0.4107%
5412	438	Accounting and bookkeeping services	0.4106%
5417	446	Scientific research and development services	0.4003%
54161	444	Management consulting services	0.3716%
5121	418	Motion picture and video industries	0.3618%
32612	173	Plastics pipe- fittings- and profile shapes	0.3478%
	499	Other State and local government enterprises	0.3101%
523	426	Securities- commodity contracts- investments	0.2964%
334413	311	Semiconductors and related device manufacturing	0.2811%
8112	484	Electronic equipment repair and maintenance	0.2685%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2624%
5241	427	Insurance carriers	0.2563%
5613	454	Employment services	0.2517%
51112	414	Periodical publishers	0.2339%
5132	421	Cable networks and program distribution	0.2272%
323111, 323112, 323113, 323114, 323115, 323119	139	Commercial printing	0.1868%
	498	State and local government electric utilities	0.1848%
32519	151	Other basic organic chemical manufacturing	0.1807%
5324	434	Machinery and equipment rental and leasing	0.1714%
5617	458	Services to buildings and dwellings	0.1611%
5321	432	Automotive equipment rental and leasing	0.1582%
5142	424	Data processing services	0.1561%
522	436	Lessors of nonfinancial intangible assets	0.1541%
72111, 72112	479	Hotels and motels- including casino hotels	0.1535%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact 14-Feb-07  
 Implan Model: FL04.iap Copyright MIG 2007  
 Impact Name: 385Cluster-rpc100 Type II Multipliers w/ RPC's 100% 1st round

Primary Industry:  
 IMPLAN 385  
 NAICS 339991  
 Gasket, Packing,  
 and Sealing Device  
 Manufacturing

NAICS Sector	IMPLAN Industry	Description	
			<u>TIER 1: &gt; 1%</u>
42	390	Wholesale trade	3.5494%
55	451	Management of companies and enterprises	2.1033%
484	394	Truck transportation	1.8576%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.1386%
2211	30	Power generation and supply	1.0662%
531	431	Real estate	1.0233%
			<u>TIER 2: 0.5% - 1%</u>
521, 5221	430	Monetary authorities and depository credit interme	0.7115%
5133	422	Telecommunications	0.6740%
5222, 5223	425	Nondepository credit intermediation and related a	0.5557%
32552	162	Adhesive manufacturing	0.5404%
722	481	Food services and drinking places	0.5317%
5411	437	Legal services	0.5145%
			<u>TIER 3</u>
5413	439	Architectural and engineering services	0.4688%
482	392	Rail transportation	0.4307%
523	426	Securities- commodity contracts- investments	0.4284%
8113	485	Commercial machinery repair and maintenance	0.4126%
5412	438	Accounting and bookkeeping services	0.3991%
54161	444	Management consulting services	0.3864%
487, 488	397	Scenic and sightseeing transportation and support	0.3138%
334413	311	Semiconductors and related device manufacturing	0.3107%
	498	State and local government electric utilities	0.2905%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2834%
562	460	Waste management and remediation services	0.2599%
32519	151	Other basic organic chemical manufacturing	0.2517%
8112	484	Electronic equipment repair and maintenance	0.2437%
5613	454	Employment services	0.2256%
5241	427	Insurance carriers	0.2068%
5418	447	Advertising and related services	0.2009%
5324	434	Machinery and equipment rental and leasing	0.1867%
493	400	Warehousing and storage	0.1858%
23*	43	Maintenance and repair of nonresidential buildings	0.1737%
5321	432	Automotive equipment rental and leasing	0.1647%
492	399	Couriers and messengers	0.1622%
72111, 72112	479	Hotels and motels- including casino hotels	0.1617%
	499	Other State and local government enterprises	0.1568%
5617	458	Services to buildings and dwellings	0.1523%
491110	398	Postal service	0.1484%
5417	446	Scientific research and development services	0.1420%
211	19	Oil and gas extraction	0.1397%
5614	455	Business support services	0.1345%
522	436	Lessors of nonfinancial intangible assets	0.1343%
5131	420	Radio and television broadcasting	0.1328%
481	391	Air transportation	0.1302%
5142	424	Data processing services	0.1292%
5611	452	Office administrative services	0.1180%
5619	459	Other support services	0.1139%

**Indirect Output Effect in Florida resulting from a change to Direct Output for Primary Industry**

Output Impact	7-Mar-07	Average of	
Implan Model: FL04.iap	Copyright MIG 2007	Primary Industries:	
Impact Name: AvgEXCL108181321-Cluster-rpc100	Type II Multipliers w/ RPC's 100% 1st round	IMPLAN 160,	
		271, 313, 317, 319,	
		320, 374, 375, 376,	
		377, 378, 379, 385, & 446	
		(EXCL. 108, 181, & 321)	
NAICS	IMPLAN		
Sector	Industry	Description	
		<u>TIER 1: &gt; 1%</u>	
42	390	Wholesale trade	5.7833%
55	451	Management of companies and enterprises	3.4224%
334111	302	Electronic computer manufacturing	1.5642%
531	431	Real estate	1.4006%
54191, 54193, 54199	450	All other miscellaneous professional and technical	1.3317%
5614	455	Business support services	1.1749%
5411	437	Legal services	1.0476%
			<u>TIER 2: 0.5% - 1%</u>
5133	422	Telecommunications	0.9390%
334413	311	Semiconductors and related device manufacturing	0.9140%
5413	439	Architectural and engineering services	0.8459%
32541	160	Pharmaceutical and medicine manufacturing	0.8390%
521, 5221	430	Monetary authorities and depository credit interne	0.7698%
484	394	Truck transportation	0.6997%
339111	374	Laboratory apparatus and furniture manufacturing	0.6983%
2211	30	Power generation and supply	0.6825%
5222, 5223	425	Nondepository credit intermediation and related a	0.6146%
5412	438	Accounting and bookkeeping services	0.6108%
339112	375	Surgical and medical instrument manufacturing	0.6107%
334412, 334414, 334415, 334416, 334417, 334418, 334419	312	All other electronic component manufacturing	0.5824%
334510	313	Electromedical apparatus manufacturing	0.5538%
722	481	Food services and drinking places	0.5218%
			<u>TIER 3</u>
5418	447	Advertising and related services	0.4963%
54161	444	Management consulting services	0.4781%
5613	454	Employment services	0.4159%
493	400	Warehousing and storage	0.3899%
523	426	Securities- commodity contracts- investments	0.3833%
5417	446	Scientific research and development services	0.3681%
	499	Other State and local government enterprises	0.3656%
327211, 327212, 327215	190	Glass and glass products- except glass containers	0.3585%
339113	376	Surgical appliance and supplies manufacturing	0.3440%
5131	420	Radio and television broadcasting	0.3318%
326191, 326199	177	Plastics plumbing fixtures and all other plastics	0.3009%
8113	485	Commercial machinery repair and maintenance	0.2981%
5617	458	Services to buildings and dwellings	0.2725%
51111	413	Newspaper publishers	0.2622%
8112	484	Electronic equipment repair and maintenance	0.2613%
522	436	Lessors of nonfinancial intangible assets	0.2491%
492	399	Couriers and messengers	0.2468%
5611	452	Office administrative services	0.2413%
339114	377	Dental equipment and supplies manufacturing	0.2117%
325991	169	Custom compounding of purchased resins	0.2115%
81111, 81112, 811191, 811198	483	Automotive repair and maintenance- except car wash	0.2038%
5324	434	Machinery and equipment rental and leasing	0.1968%
33791	372	Mattress manufacturing	0.1942%
72111, 72112	479	Hotels and motels- including casino hotels	0.1909%
5619	459	Other support services	0.1904%

## Appendix D

### Economic Contribution Multipliers – Medical Products Industry Cluster

In this section, we report additional economic contribution results, including calculated multipliers for each component of the economic contribution for each primary industry.

IMPLAN Sector 160 represents the Pharmaceuticals Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then all of Florida.

Tampa Bay  
 Implan Sector 160  
 NAICS 32541  
 Pharmaceutical and Medicine Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 841,920,000	1,072.9	\$ 69,159,432
Indirect	\$ 443,994,060	2,707.8	\$128,305,082
Induced	\$ 200,951,749	1,971.4	\$ 65,959,091
<b>Total</b>	<b>\$1,486,865,809</b>	<b>5,752.1</b>	<b>\$263,423,605</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.53	2.52	1.86
Induced	0.24	1.84	0.95
<b>Total</b>	<b>1.77</b>	<b>5.36</b>	<b>3.81</b>

Florida  
 Implan Sector 160  
 NAICS 32541  
 Pharmaceutical and Medicine Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$3,327,183,104	4,149.2	\$ 296,621,728
Indirect	\$1,699,505,878	10,185.2	\$ 506,172,707
Induced	\$ 806,172,291	7,801.6	\$ 265,531,201
<b>Total</b>	<b>\$5,832,861,273</b>	<b>22,136.0</b>	<b>\$1,068,325,636</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.51	2.45	1.71
Induced	0.24	1.88	0.90
<b>Total</b>	<b>1.75</b>	<b>5.34</b>	<b>3.60</b>



IMPLAN Sector 181 represents Other Rubber Product Manufacturing, which includes NAICS 326291 and 326299. NAICS 326299 is considered a part of the Medical Devices Segment of the Medical Products Industry Group. Although NAICS 326291 is not considered a part of the Medical Products Industry Group, we cannot disaggregate the IMPLAN sector into its individual components. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 181  
 NAICS 32629  
 Other Rubber Product Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 61,036,000	331.2	\$ 14,324,727
Indirect	\$ 16,703,993	126.6	\$ 5,612,512
Induced	\$ 20,289,334	199.0	\$ 6,659,639
<b>Total</b>	<b>\$ 98,029,327</b>	<b>656.8</b>	<b>\$ 26,596,878</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.27	0.38	0.39
Induced	0.33	0.60	0.46
<b>Total</b>	<b>1.61</b>	<b>1.98</b>	<b>1.86</b>

Florida  
 Implan Sector 181  
 NAICS 32629  
 Other Rubber Product Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 323,884,992	1,733.7	\$ 76,803,888
Indirect	\$ 88,048,253	664.5	\$ 29,975,072
Induced	\$ 107,228,279	1,037.7	\$ 35,318,078
<b>Total</b>	<b>\$ 519,161,524</b>	<b>3,435.9</b>	<b>\$142,097,038</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.27	0.38	0.39
Induced	0.33	0.60	0.46
<b>Total</b>	<b>1.60</b>	<b>1.98</b>	<b>1.85</b>

IMPLAN Sector 271 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 271  
 NAICS 333314  
 Optical Instrument and Lens Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 48,600,000	238.2	\$ 16,610,463
Indirect	\$ 20,953,588	144.9	\$ 6,785,079
Induced	\$ 23,808,695	233.6	\$ 7,814,811
<b>Total</b>	<b>\$ 93,362,283</b>	<b>616.7</b>	<b>\$ 31,210,353</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.43	0.61	0.41
Induced	0.49	0.98	0.47
<b>Total</b>	<b>1.92</b>	<b>2.59</b>	<b>1.88</b>

Florida  
 Implan Sector 271  
 NAICS 333314  
 Optical Instrument and Lens Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 337,388,000	1,608.0	\$119,592,048
Indirect	\$ 144,511,380	984.2	\$ 47,799,340
Induced	\$ 168,095,703	1,626.7	\$ 55,366,152
<b>Total</b>	<b>\$ 649,995,083</b>	<b>4,218.9</b>	<b>\$222,757,540</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.43	0.61	0.40
Induced	0.50	1.01	0.46
<b>Total</b>	<b>1.93</b>	<b>2.62</b>	<b>1.86</b>

IMPLAN Sector 313 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 313  
 NAICS 334510  
 Electromedical Apparatus Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 615,094,016	1,758.5	\$116,813,320
Indirect	\$ 306,365,809	2,138.3	\$102,999,294
Induced	\$ 223,694,403	2,194.5	\$ 73,423,991
<b>Total</b>	<b>\$1,145,154,228</b>	<b>6,091.3</b>	<b>\$293,236,605</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.50	1.22	0.88
Induced	0.36	1.25	0.63
<b>Total</b>	<b>1.86</b>	<b>3.46</b>	<b>2.51</b>

Florida  
 Implan Sector 313  
 NAICS 334510  
 Electromedical Apparatus Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$1,269,085,952	3,586.8	\$251,935,056
Indirect	\$ 638,587,448	4,349.4	\$216,358,214
Induced	\$ 470,263,803	4,550.9	\$154,892,103
<b>Total</b>	<b>\$2,377,937,203</b>	<b>12,487.1</b>	<b>\$623,185,373</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.50	1.21	0.86
Induced	0.37	1.27	0.61
<b>Total</b>	<b>1.87</b>	<b>3.48</b>	<b>2.47</b>

IMPLAN Sector 317 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
Implan Sector 317  
NAICS 334514  
Totalizing Fluid Meters and Counting Devices

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 404,000	2.0	\$ 43,230
Indirect	\$ 168,743	1.2	\$ 58,876
Induced	\$ 103,909	1.0	\$ 34,106
<b>Total</b>	<b>\$ 676,652</b>	<b>4.2</b>	<b>\$ 136,212</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.42	0.60	1.36
Induced	0.26	0.50	0.79
<b>Total</b>	<b>1.67</b>	<b>2.10</b>	<b>3.15</b>

Florida  
Implan Sector 317  
NAICS 334514  
Totalizing Fluid Meters and Counting Devices

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 166,260,992	500.2	\$ 23,575,454
Indirect	\$ 73,476,137	509.3	\$ 25,075,954
Induced	\$ 48,856,109	472.8	\$ 16,091,874
<b>Total</b>	<b>\$ 288,593,238</b>	<b>1,482.3</b>	<b>\$ 64,743,282</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.44	1.02	1.06
Induced	0.29	0.95	0.68
<b>Total</b>	<b>1.74</b>	<b>2.96</b>	<b>2.75</b>

IMPLAN Sector 319 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 319  
 NAICS 334516  
 Analytical Laboratory Instrument Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 107,382,000	373.0	\$ 30,525,932
Indirect	\$ 57,882,196	517.3	\$ 20,795,535
Induced	\$ 52,227,772	512.4	\$ 17,142,904
<b>Total</b>	<b>\$ 217,491,968</b>	<b>1,402.7</b>	<b>\$ 68,464,371</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.54	1.39	0.68
Induced	0.49	1.37	0.56
<b>Total</b>	<b>2.03</b>	<b>3.76</b>	<b>2.24</b>

Florida  
 Implan Sector 319  
 NAICS 334516  
 Analytical Laboratory Instrument Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 181,162,000	620.3	\$ 53,293,700
Indirect	\$ 96,846,177	881.6	\$ 35,246,978
Induced	\$ 88,913,220	860.4	\$ 29,285,596
<b>Total</b>	<b>\$ 366,921,397</b>	<b>2,362.3</b>	<b>\$117,826,274</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.53	1.42	0.66
Induced	0.49	1.39	0.55
<b>Total</b>	<b>2.03</b>	<b>3.81</b>	<b>2.21</b>

IMPLAN Sector 374 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
Implan Sector 374  
NAICS 339111  
Laboratory Apparatus and Furniture Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 17,282,000	94.8	\$ 4,897,472
Indirect	\$ 8,981,845	62.5	\$ 2,931,472
Induced	\$ 7,967,204	78.2	\$ 2,615,103
<b>Total</b>	<b>\$ 34,231,049</b>	<b>235.5</b>	<b>\$ 10,444,047</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.52	0.66	0.60
Induced	0.46	0.82	0.53
<b>Total</b>	<b>1.98</b>	<b>2.48</b>	<b>2.13</b>

Florida  
Implan Sector 374  
NAICS 339111  
Laboratory Apparatus and Furniture Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 92,516,000	480.2	\$ 29,629,416
Indirect	\$ 46,327,174	313.1	\$ 15,604,531
Induced	\$ 45,424,262	439.6	\$ 14,961,516
<b>Total</b>	<b>\$ 184,267,436</b>	<b>1,232.9</b>	<b>\$ 60,195,463</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.50	0.65	0.53
Induced	0.49	0.92	0.50
<b>Total</b>	<b>1.99</b>	<b>2.57</b>	<b>2.03</b>

IMPLAN Sector 375 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 375  
 NAICS 339112  
 Surgical and Medical Instrument Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 573,224,000	2,318.8	\$174,400,688
Indirect	\$ 233,477,716	1,644.2	\$ 80,598,063
Induced	\$ 259,501,936	2,545.8	\$ 85,177,227
<b>Total</b>	<b>\$1,066,203,652</b>	<b>6,508.8</b>	<b>\$340,175,978</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.41	0.71	0.46
Induced	0.45	1.10	0.49
<b>Total</b>	<b>1.86</b>	<b>2.81</b>	<b>1.95</b>

Florida  
 Implan Sector 375  
 NAICS 339112  
 Surgical and Medical Instrument Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$2,324,623,872	8,546.8	\$ 734,253,120
Indirect	\$ 921,257,201	6,330.4	\$ 321,080,864
Induced	\$1,059,774,418	10,255.8	\$ 349,060,860
<b>Total</b>	<b>\$4,305,655,491</b>	<b>25,133.0</b>	<b>\$1,404,394,844</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.40	0.74	0.44
Induced	0.46	1.20	0.48
<b>Total</b>	<b>1.85</b>	<b>2.94</b>	<b>1.91</b>

IMPLAN Sector 376 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for all of Florida.

Tampa Bay  
 Implan Sector 376  
 NAICS 339113  
 Surgical Appliance and Supplies Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 431,567,008	1,711.8	\$131,096,936
Indirect	\$ 171,062,777	1,161.0	\$ 57,591,788
Induced	\$ 192,020,949	1,883.8	\$ 63,027,706
<b>Total</b>	<b>\$ 794,650,734</b>	<b>4,756.6</b>	<b>\$251,716,430</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.40	0.68	0.44
Induced	0.44	1.10	0.48
<b>Total</b>	<b>1.84</b>	<b>2.78</b>	<b>1.92</b>

Florida  
 Implan Sector 376  
 NAICS 339113  
 Surgical Appliance and Supplies Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 899,924,992	3,589.8	\$273,518,816
Indirect	\$ 350,732,142	2,344.2	\$119,763,279
Induced	\$ 394,936,667	3,821.9	\$130,081,394
<b>Total</b>	<b>\$1,645,593,801</b>	<b>9,755.9</b>	<b>\$523,363,489</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.39	0.65	0.44
Induced	0.44	1.06	0.48
<b>Total</b>	<b>1.83</b>	<b>2.72</b>	<b>1.91</b>



IMPLAN Sector 377 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 377  
 NAICS 339114  
 Dental Equipment and Supplies Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 6,820,000	42.6	\$ 1,801,452
Indirect	\$ 2,821,801	21.1	\$ 1,011,484
Induced	\$ 2,862,612	28.1	\$ 939,605
<b>Total</b>	<b>\$ 12,504,413</b>	<b>91.8</b>	<b>\$ 3,752,541</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.41	0.50	0.56
Induced	0.42	0.66	0.52
<b>Total</b>	<b>1.83</b>	<b>2.15</b>	<b>2.08</b>

Florida  
 Implan Sector 377  
 NAICS 339114  
 Dental Equipment and Supplies Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 119,334,000	575.6	\$ 41,476,672
Indirect	\$ 43,788,880	311.3	\$ 15,724,716
Induced	\$ 57,442,046	555.9	\$ 18,919,847
<b>Total</b>	<b>\$ 220,564,926</b>	<b>1,442.8</b>	<b>\$ 76,121,235</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.37	0.54	0.38
Induced	0.48	0.97	0.46
<b>Total</b>	<b>1.85</b>	<b>2.51</b>	<b>1.84</b>

IMPLAN Sector 378 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
Implan Sector 378  
NAICS 339115  
Ophthalmic Goods Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 523,807,008	1,821.5	\$191,094,720
Indirect	\$ 166,339,056	1,247.1	\$ 57,329,031
Induced	\$ 252,810,936	2,480.1	\$ 82,981,017
<b>Total</b>	<b>\$ 942,957,000</b>	<b>5,548.7</b>	<b>\$331,404,768</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.32	0.68	0.30
Induced	0.48	1.36	0.43
<b>Total</b>	<b>1.80</b>	<b>3.05</b>	<b>1.73</b>

Florida  
Implan Sector 378  
NAICS 339115  
Ophthalmic Goods Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$1,243,870,976	4,882.8	\$425,072,992
Indirect	\$ 395,700,049	2,929.6	\$138,742,331
Induced	\$ 566,187,443	5,479.2	\$186,486,740
<b>Total</b>	<b>\$2,205,758,468</b>	<b>13,291.6</b>	<b>\$750,302,063</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.32	0.60	0.33
Induced	0.46	1.12	0.44
<b>Total</b>	<b>1.77</b>	<b>2.72</b>	<b>1.77</b>

IMPLAN Sector 385 represents a component of the Medical Devices Segment. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
 Implan Sector 385  
 NAICS 339991  
 Gasket, Packing, and Sealing Device Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 3,325,000	20.3	\$ 1,561,444
Indirect	\$ 776,983	5.8	\$ 257,102
Induced	\$ 1,850,661	18.2	\$ 607,449
<b>Total</b>	<b>\$ 5,952,644</b>	<b>44.3</b>	<b>\$ 2,425,995</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.23	0.29	0.16
Induced	0.56	0.90	0.39
<b>Total</b>	<b>1.79</b>	<b>2.18</b>	<b>1.55</b>

Florida  
 Implan Sector 385  
 NAICS 339991  
 Gasket, Packing, and Sealing Device Manufacturing

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 39,716,000	272.8	\$ 16,761,757
Indirect	\$ 9,990,657	74.7	\$ 3,371,869
Induced	\$ 20,218,325	195.7	\$ 6,659,366
<b>Total</b>	<b>\$ 69,924,982</b>	<b>543.2</b>	<b>\$ 26,792,992</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.25	0.27	0.20
Induced	0.51	0.72	0.40
<b>Total</b>	<b>1.76</b>	<b>1.99</b>	<b>1.60</b>

IMPLAN Sector 446 represents Scientific Research and Development Services, which includes NAICS 54171 and 54172. NAICS 54171 is considered the Biotech Segment of the Medical Products Industry Group. Although NAICS 54172 is not considered a part of the Medical Products Industry Group, we cannot disaggregate the IMPLAN sector into its individual components. The tables below present the levels of economic contribution in **Panel A** and the calculated multiplier for each component of the economic contribution in **Panel B** first for Tampa Bay, then for Florida.

Tampa Bay  
Implan Sector 446  
NAICS 5417  
Scientific Research and Development Services

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$ 241,732,000	2,683.8	\$137,089,104
Indirect	\$ 91,993,019	895.7	\$ 33,192,936
Induced	\$ 173,289,179	1,700.0	\$ 56,879,316
<b>Total</b>	<b>\$ 507,014,198</b>	<b>5,279.5</b>	<b>\$227,161,356</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.38	0.33	0.24
Induced	0.72	0.63	0.41
<b>Total</b>	<b>2.10</b>	<b>1.97</b>	<b>1.66</b>

Florida  
Implan Sector 446  
NAICS 5417  
Scientific Research and Development Services

Panel A - Levels of Contribution

	Output	Employment	Labor Income
Direct	\$1,883,682,048	18,045.1	\$1,184,985,088
Indirect	\$ 628,576,530	6,152.7	\$ 228,250,004
Induced	\$1,419,180,946	13,733.9	\$ 467,439,584
<b>Total</b>	<b>\$3,931,439,524</b>	<b>37,931.7</b>	<b>\$1,880,674,676</b>

Panel B - Multipliers

	Output	Employment	Labor Income
Direct	1.00	1.00	1.00
Indirect	0.33	0.34	0.19
Induced	0.75	0.76	0.39
<b>Total</b>	<b>2.09</b>	<b>2.10</b>	<b>1.59</b>