AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

International Agricultural Trade and Policy Center

TRADE ADJUSTMENT ASSISTANCE BY INDUSTRY: FLORIDA

By

Robert D. Emerson, Orachos Napasintuwong, Lurleen Walters, & John J. VanSickle

PBTC 04-1 **January 2004**

POLICY BRIEF SERIES

UNIVERSITY OF FLORIDA

Institute of Food and Agricultural Sciences

INTERNATIONAL AGRICULTURAL TRADE AND POLICY CENTER

MISSION AND SCOPE: The International Agricultural Trade and Policy Center (IATPC) was established in 1990 in the Food and Resource Economics Department (FRED) of the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida. Its mission is to provide information, education, and research directed to immediate and long-term enhancement and sustainability of international trade and natural resource use. Its scope includes not only trade and related policy issues, but also agricultural, rural, resource, environmental, food, state, national and international policies, regulations, and issues that influence trade and development.

OBJECTIVES:

The Center's objectives are to:

- Serve as a university-wide focal point and resource base for research on international agricultural trade and trade policy issues
- Facilitate dissemination of agricultural trade related research results and publications
- Encourage interaction between researchers, business and industry groups, state and federal agencies, and policymakers in the examination and discussion of agricultural trade policy questions
- Provide support to initiatives that enable a better understanding of trade and policy issues that impact the competitiveness of Florida and southeastern agriculture specialty crops and livestock in the U.S. and international markets

Trade Adjustment Assistance by Industry: Florida*

Robert D. Emerson, Orachos Napasintuwong, Lurleen Walters and John J. VanSickle

Introduction

The economic welfare enhancing benefits of free trade have been recognized by economists since the work of Ricardo. Although the economy and society gain as a whole with increased free trade, some groups typically face economic adjustment since there are distributional effects associated with changes in international trade. Among the groups requiring adjustment to the new environment are domestic producers who may face greater competition in the international market, and associated workers who may be displaced as a result of the reduced demand for their services. As a result, worker groups have often opposed increased international trade. A government response has been to provide benefits to workers adversely affected by free trade agreements. Among the benefits typically included are various forms of adjustment assistance including relocation assistance, job training, and extended unemployment benefits.

Trade adjustment assistance was initiated in 1962 with the Trade Expansion Act. The most recent version is The Trade Adjustment Assistance Reform Act of 2002 (TAA) (U.S. Department of Labor). The program provides benefits to workers dislocated from their jobs as a result of 1) increased importation of goods for the same, or linked, industries where they had formerly been employed, or 2) relocation of production from the U.S. to other free trade areas. Eligible worker groups include not only those directly impacted by importation or production relocation, but also those in secondary industries who are either upstream or downstream from the directly affected industry and can demonstrate a loss of employment. TAA applies to international trade under the following agreements: Free Trade Agreements with the U.S. (FTA),[1] Andean Trade Preference Act (ATPA),[2] African Growth and Opportunity Act (AGOA),[3] and the Caribbean Basin Economic Recovery Act (CBERA).[4]

This report summarizes a cooperative research effort between the Florida Agency for Workforce Innovation (AWI) and the International Agricultural Trade and Policy Center at the University of Florida. The broad purpose of the project was to provide AWI assistance with

* The research on which this report is based was funded in part by the Florida Agency for Workforce Innovation. The manuscript has benefited from the comments of David Mulkey.

[1] Canada, Israel, Hashemite Kingdom of Jordan, and Mexico.

[2] Bolivia, Colombia, Ecuador, and Peru.

[3] Benin, Botswana, Cameroon, Cape Verde, Central African Republic, Chad, Republic of Congo, Cote d'Ivoire, Djibouti, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Tanzania, Uganda, and Zambia.

[4] Antigua and Barbuda, Aruba, Commonwealth of Bahamas, Belize, British Virgin Islands, Costa Rica, Montserrat, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Dominican Republic, Nicaragua, Panama, St. Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Dominica, and Netherlands Antilles.

information to focus staff resources in appropriate areas of the state with an orientation to the industries most likely to be affected.

The Research Problem

The research had the following three specific objectives:

1. Determination of the Florida industries most likely to be affected by increased levels of imports from the free trade areas covered under TAA (see above areas and countries);

2. Estimation of the potential job loss impacts of the Florida industries most likely to be affected by increased imports or relocation of domestic production; and

3. Projection of the geographic areas of Florida most likely to be affected by job losses due to increased international trade or production relocation.

The extent to which increased international trade results in job loss is a contentious issue among economists. One set of studies, for example, suggests that import competition accounts for only a small portion of job loss in trade sensitive industries (Grossman, 1986; Mann, 1988; Dickens, 1988; and Blanchflower, 2000). However, another set suggests that import competition has a strong significant influence on displacement and wage inequality (Revenga, 1992; and Belman and Lee, 1996). The typical debate among economists concerns a longer term adjustment in contrast to the interest of AWI in assisting with the immediate effects of worker displacement due to trade effects. Indeed, one could argue that through the efforts of AWI and their counterparts in other states, worker displacement effects are minimized over the longer term. AWI's efforts through the TAA are precisely to assist in worker adjustment to the changing labor market as a result of international trade. Over time workers are expected to transfer to other industries expanding with increased *exports*. Nevertheless, the adjustment can be time-consuming, and it can be costly for the worker as well as the worker's family, both monetarily and psychologically. The cost typically increases when further training is needed to upgrade a worker's skills to be more marketable in today's economy, most importantly in terms of foregone earnings, but also in the direct cost of the training. Older workers having skills no longer highly valued in the labor market can be among the most severely impacted through displacement. Since their remaining work life is shorter, the potential for a positive return on job training and skill development is much lower than with a younger worker. It is noteworthy that an added feature of the current TAA is that it has special provisions for workers over age 50.

Since the interest in this report is determining the industries likely to be affected by free trade so that programs can be focused on labor associated with impacted industries as necessary, the longer term question is not addressed in the report. The very effort of AWI to assist the workers in reemployment is to mitigate adverse long run impacts of increased international trade.

The Methodology

Evaluation of the employment impacts of free trade areas on Florida would ideally be done with an empirical model of international trade and employment for the state. Such a model could form predictions for which industries are most likely to be impacted in the future, and how

workers with various characteristics associated with those industries are likely to adapt to the resulting changes in the labor market. In addition, a more complete model could account for the extent of trade and labor market adjustment that has already taken place with the free trade areas that have been in existence for some time. However, a model of this type would require far more development time than was feasible under this project.

Given the short-term nature of this research project, a static approach was adopted to provide indicators of which industries are most likely to be impacted. The approach can be summarized in three stages:

- Identification of the Florida industries with the most significant imports from the trade areas of interest
- Evaluation of the *direct* Florida employment impacts of the above imported goods
- Evaluation of potential *secondary* employment impacts due to imported goods from the areas of interest

Florida Industry Identification

The trade areas of interest were identified above (FTA, ATPA, AGOA, and CBERA). Imports entering Florida under the trade preference arrangements of each of these programs were identified on the basis of Florida's two customs reporting districts: Miami and Tampa. Imports under trade preferences for the areas of interest were aggregated for the Miami and Tampa districts to form the Florida estimate.[5] Although one means of determining the industries most directly impacted is by ranking the industries by value of the imports under trade preferences, there are equally meaningful alternatives. One alternative is an import penetration ratio formed as the ratio of trade preference imports to the sum of all Florida imports and Florida production. The larger is the import penetration ratio, the more significant are trade preference imports in the industry. Two other alternatives are 1) an import penetration ratio defined as the ratio of all Florida imports to the sum of Florida production and Florida imports, and 2) the proportion of all Florida imports represented by trade preference imports from the areas of interest. Each of these gives somewhat different information, but together they provide a clearer picture of the relevance of the selected imports for various Florida industries.

Direct Florida Employment Impacts

The direct employment impacts are an estimate of the employment reduction following from the importation of goods under the trade preference agreements rather than producing the goods in Florida. These assume a static technology with the simplifying assumption that

[5] A serious limitation of the data source is that the port of entry need not reflect the end use destination for the imported goods. However, given the geography of Florida as a large peninsula, the problem may be considerably less severe than for other coastal areas of the U.S. Similarly, there are significant imports of commodities that enter the U.S. market through non-Florida ports, but are also produced in Florida. Important agricultural examples are orange juice and tomatoes. Likewise, specific commodities produced largely outside Florida are imported through Florida ports.

employment is proportional to output.[6] The procedure is to first determine the employment coefficient for Florida production by industry (Employment/(Gross output)). The ratio is then applied to the value of Florida trade preference imports to obtain an estimate of employment that would be associated with the imports at the industry level as below for the i^{th} industry:

$$Direct\ Employment\ Effect_i = Imports_i \times \frac{Employment_i}{Gross\ Output_i}$$

These estimates should not be interpreted as measures of employment displacement. They are retrospective estimates based on existing flows of imports, and are best interpreted as indicators of the sensitivity of employment to imports across industry. The approach provides an indicator of the sensitivity of immediate, direct employment impacts of potential changes in industry level production due to increased flows of imports. The estimates measure the effect only on the industry in question; they do not account for any secondary employment changes from industries supplying goods to the industry in question, or further transformation of the product by other industries. Over the longer term, most workers find alternative employment; in the short term, many require no assistance in locating alternative employment.

Secondary Employment Impacts

TAA also provides benefits to workers in industries either supplying the industry directly affected by imports, or in industries supplied by the affected industry. Identification of the potentially important secondary industries is done with an input-output (IO) analysis. Utilizing an inter-industry transactions matrix, the secondary impacts on associated industries can be traced, and the effect on employment calculated. The secondary effects are determined at the U.S. level for two reasons, and then apportioned to Florida. First, in many cases the supplying industries and supplied industries may be in different states. For example, most imports of a particular good may be into areas of the U.S. other than Florida, but Florida may have important secondary industries associated with the imported good. A second consideration is that the transactions data to form the IO matrix are readily available at the U.S. level.

The most recent (1999) IO inter-industry transactions matrix from the Bureau of Economic Analysis, U.S. Department of Commerce was used.[7] The IO approach provides a convenient means of tracing secondary effects in industries other than the industry with increased imports. IO analysis assumes a static technology linking one industry with another. Again, although this is an unrealistic assumption for a long run analysis due to input substitution possibilities and changing technology, it provides a reasonable approach to address short run impacts as desired in this project.

The basic structure of IO analysis is that the gross output of an industry is distributed to other industries and to final demand for the good:

$$q_i = q_{i1} + q_{i2} + \cdots + q_{in} + D_i \qquad i = 1, \cdots, n$$

[6] Although this is reasonable for a very short run analysis as under consideration here, this is typically a very poor assumption for a longer time frame when industries can adjust technologies and substitute among various factors of production, including labor.

[7] The specific table used was the use of commodities by industries before redefinition.

where q_i is the gross output of the ith good, the q_{ij}'s are the uses of the ith good in the jth industries, and D_i is the final demand for the ith good. The fixed proportions production technology assumption is that:

$$q_{ij} = a_{ij} q_j$$

The technical coefficient a_{ij} is the amount of the ith good required in the production of the jth good. By substituting this relationship in the previous equation, the following relationship is obtained:

$$q_i - a_{i1}q_1 - a_{i2}q_2 - \cdots - a_{ii}q_i - \cdots - a_{in}q_n = D_i \qquad i = 1, \cdots, n$$

or,

$$-a_{i1}q_1 - a_{i2}q_2 - \cdots - (1 - a_{ii})q_i - \cdots - a_{in}q_n = D_i \qquad i = 1, \cdots, n$$

Putting all n equations together, representing all goods and services in the economy, the system can be written conveniently in matrix form as:

$$(I - A)q = D$$

where I is an n×n identity matrix, A is the n×n matrix of technology coefficients, a_{ij}, q is the n-element vector of industry outputs, and D is an n-element vector of final demands of the n goods.

The secondary industry effects are now conveniently found given a change in final demands by solving the equation immediately above for q:

$$q = (I - A)^{-1} \times D$$

The secondary effects of interest are due to the trade agreement imports. Assuming no change in consumer demand, an increase (a reduction) in imports is equivalent to a decrease (an increase) in final demand for an industry's output.

Two approaches could be considered in calculating the secondary effects. The first is a standard IO approach in which all changes in final demand occur jointly. In this case, D consists of the values of imports for each of the trade agreement imports. The solution of the above equation provides the secondary effects with a simultaneous change in all trade agreement imports, corresponding to a simplified general equilibrium solution. While this is very concise giving a set of impacts over all changes, it is not very realistic or useful for the current problem.

A scenario more useful for AWI in the context of Trade Adjustment Assistance is the identification of the secondary industries given an impact from a *single* industry which may have just reduced, or ceased, production due to changes in international trade. In this case, the more relevant analysis is to specify D, the final demand change, as zeros for all goods other than the good from the industry currently impacted. With this approach, the relevant secondary industries are readily identified. The analysis is repeated for each of the imported goods.

With the changes in secondary industry output identified, the associated secondary employment impacts can be estimated. We assume that Florida shares equally with other areas of the country in the contraction of secondary output due to increased imports of a good. The short term assumption of fixed proportions of employment to output is also maintained as it was for the direct effects. The calculation is then as follows:

$$Secondary\ Employment\ Effect_{ij} = \frac{Secondary\ Output\ Change_{ij}}{U.S.\ Output_i} \times Florida\ Employment_i$$

This is to be interpreted as the change in employment in the i^{th} industry induced by a change in imports in the j^{th} industry. The secondary output changes in the above equation come from the earlier IO solution for *q*.

Empirical Estimates

Data

Four sets of data are required for the analysis. The value of imports is required to gauge the relevance of imports across industries in the state. The primary source for import data in the U.S. is the U.S. Department of Commerce, although the data are presented in alternative ways by a number of different agencies. A convenient source for the data providing detailed imports according to various trade agreements is the U.S. International Trade Commission. Trade data are available for various time periods in alternative industry classification schemes. The critical constraint for this project is the availability of three sets of data with a common classification scheme: trade data, domestic output data, and employment data. Although current trade data are available into the current year, the most recent gross state product data by industry are for the year 2000. The industry classification scheme adopted is the 3-digit SIC. However, the input-output transactions data from BEA use a modified SIC classification, so the 3-digit SIC trade data have been grouped as appropriate to match the IO tables. Employment data have also been grouped according to the BEA IO classifications from the 3-digit SIC classification. State level output data are available at the 2-digit SIC level.

In the end, data restrictions limit the estimates to the 2-digit SIC level for the direct employment effects due to trade. Since the indirect employment effect calculations are not based on the state level output data, more detailed categories are available corresponding to the BEA IO classification scheme.

Imports

One measure of the significance of imports in an economy is through an import penetration ratio. The ratio is defined as the ratio of imports for a good to the sum of domestic production and imports. Table 1 displays imports through Florida ports and Florida production for the year 2000 by industry.[8] The first column of data is the value of production in Florida. The next three columns are various groupings of imports. The first is the value of all imports entering through Florida ports, regardless of the source country. The second import column is all imports from the pertinent trade agreement countries, regardless of whether or not they were given trade preference. The third of the import columns is the value of imports from trade agreement countries which entered under trade preference agreements. Considering imports over all commodities, approximately one-third of all imports through Florida ports are from the trade agreement countries. However, only 17 percent of the imports from these countries were subject to trade preferences (2,236/13,530). The two industries with over a billion dollars in imports from the trade agreement countries were apparel and textiles with $7.0 billion, and agriculture with $1.2 billion. However, less than two percent of the apparel and textiles were imported under trade preferences. Agricultural imports were one-third of all trade preference goods

[8] SIC sectors above 39 are not included in the table since they are "non-tradable" goods such as transportation, services, and government.

imported from the trade agreement countries. The next largest was chemicals with less than half as much as agricultural imports under trade preferences.

The final three columns of the table are import penetration ratios, measures of the relative importance of imported goods compared to domestic production:

$$Ratio_i = \frac{Imports_i}{Gross\ State\ Product + All\ Imports}$$

where *i* is alternatively all imports, all imports from trade agreement countries, and trade preference imports from trade agreement countries. While the values of imports are indicators of the absolute volumes of imports, the penetration ratios are measures of the relative significance of imports in the availability of various products in Florida. Eleven of the 27 industries have import penetration ratios exceeding 50 percent: coal mining, tobacco products, textile mill products, apparel and textiles, furniture and fixtures, petroleum products, leather products, primary metals, industrial machinery, transportation equipment, and miscellaneous manufacturing. Turning to imports from the trade agreement countries, only three of the 27 industries have import penetration ratios exceeding 50 percent: coal mining, textile mill products, and apparel and textiles. When the imports are restricted to include only trade preference imports from the trade agreement countries, the highest ratio is 39 percent for tobacco products. Agriculture is the next highest with 13 percent; all others are less than ten percent.

Direct Employment Impacts

Direct employment impacts have been estimated assuming a constant employment to output ratio by industry as outlined above. Multiplying this ratio by the level of imports of the corresponding commodity yields the direct employment effect for the industry. Table 2 summarizes the direct employment impact estimates for Florida by industry. (See figures for a graphical presentation.) As is apparent from table 2, it is not necessarily the largest industries in terms of output, employment or imports, each taken individually, that are likely to have the greatest employment effect. For example, among the industries listed, construction has the largest gross state output and employment share, but construction is only domestically produced.[9] On the other hand, the apparel and textiles industry has a relatively small domestic output in Florida, but the labor intensive nature of production suggests a relatively large employment effect. As is apparent from the employment share column of the table, none of the industries with imported goods has a very large employment share. The largest employment share for an industry with any significant level of imported goods is agriculture, but still representing only 1.19 percent of employment in the state.[10]

The values of most interest in the table are the last column, the direct employment impact. The values in this column are the product of the ratio of employment to gross state product multiplied by the value of imports. The values indicate the magnitude of employment required had the imported goods been produced in Florida under the same technology as current domestic production. In interpreting these numbers, it is essential to bear in mind that these are not in any way indicative of the numbers of employees who might become eligible under TAA.

---

[9] There are additional non-tradable goods and services excluded from the table having SIC codes above 39. Examples are transportation, wholesale and retail trade, services, and government.

[10] Agricultural services, forestry and fishing, and printing and publishing each have a slightly higher percentage than agriculture, but the level of imports is trivial in each case since the products are largely non-tradable.

At best, they provide a ranking of the industries where employment is most sensitive to increased levels of imports.

The most sensitive industry by far is agriculture as illustrated in table 2, and more strikingly in figure 1. The estimated employment effect is over three times that of the next closest industry. The agricultural commodities most sensitive to import competition from the countries under TAA are vegetables; fresh flowers, seeds and foliage; non-citrus fruits; and nursery products and trees. Although citrus is the largest employer of agricultural labor, the primary source of citrus import competition (Brazil) is not among the countries included under TAA.

Other than agriculture, the industries with estimates of over 1,000 workers represented by the level of imports are: apparel and textiles, transportation equipment, miscellaneous manufacturing, chemicals, tobacco products, rubber and plastics, food and kindred products, and leather products. With this apparent combination of imports and labor intensity in production, the above industries, plus agriculture, are judged to be the most likely candidates for further employment adjustment that would be eligible for TAA.

Regional Allocations

Florida's 67 counties are organized into 24 Regional Workforce Boards as illustrated in figure 2. The potential employment adjustment is allocated to the Regional Workforce Boards by the location of employment in affected industries. Table 3 shows the allocations by Regional Workforce Board; they are also illustrated graphically in figure 3. While figure 3 appropriately represents the potential for employment assistance in the various regions of the state, the regional allocation is directly related to the employment share in the various regions. To compensate for the differences in employment among regions, the employment effects are illustrated in figure 4 relative to total employment in the respective regions. The result is that most sensitive areas are no longer concentrated in the major metropolitan areas. Figure 3 represents the potential volume of employee adjustment; figure 4 is more representative of the potential employment sensitivity relative to total employment.

Many industries are concentrated in a few local areas of Florida. Correspondingly, regional workforce board personnel can focus their attention on sensitive industries located in their region. The first and second most sensitive industries for each workforce region are illustrated in figures 5 and 6, respectively. It is apparent from the figures that the most sensitive industry varies from one region to another, and that some regions are far more likely to have impacts than others. In accordance with the statewide importance of farms as shown in figure 1, the farming industry is the most sensitive industry in 13 of the 24 workforce boards (figure 5). The next closest industry is the transportation equipment industry as the most sensitive in three of the 24 workforce boards. Among the second most sensitive industries (figure 6), transportation equipment appears in six of the 24 workforce boards and farms appear in five of the workforce boards.

The distribution across the state of the three most sensitive industries is illustrated in figures 7, 8 and 9. The most sensitive industry statewide, agriculture, is one of the more widely distributed industries in Florida, although agricultural employment is largely in central and south

Florida. Regional Workforce Boards 12, 15, 21, 23 and 24 are each ranked as having impacts of more than 1,000 workers in agriculture (figure 7). By contrast, nearly half of the Florida apparel and textiles industry is located in Regional Workforce Board 23, and that is where any major employment adjustment effects would be expected with adjustment by that industry due to trade (figure 8). The third most sensitive industry, transportation equipment, is distributed rather evenly along the east coast workforce regions, and the Tampa Bay area (figure 9).

Secondary Employment Impacts

Secondary effects have been calculated through the use of an input-output analysis. As discussed earlier, the input-output analysis is done at the U.S. level and then allocated to Florida since affiliated industries need not be in the same state to be affected. The allocation is proportional to the share of Florida production of the commodity relative to total U.S. production. The changes in imports are introduced as the change in final demand for the input-output analysis. Although one way to proceed is to include all of the import commodities in the final demand, this assumes that all imports will change at the same time, a rather unlikely scenario. The approach taken has been to introduce a single import good at a time, and calculate the implied inter-industry changes associated with that one import good. The likely scenario is a plant closure in a particular industry; the issue is what affiliated industries are likely to be affected. The one-good-at-a-time approach addresses this question.

Given successive changes in each of the imported goods, the secondary changes in output from the input-output analysis are available at the U.S. level. Although secondary effects were calculated for each industry, the results quickly yield so much detail that they are not very useful. A number of the same secondary industries reappeared with each successive individual industry analysis. Given the commonality in secondary effects across industries, the effects are accumulated for all industries where the secondary employment impact was 500 or more workers, or if the industry ranked among the top seven industries in the direct employment impact.

As illustrated in figure 10, nine of the secondary industries have estimated employment effects exceeding 1,000 workers, and the largest is over 9,000. Interestingly, the top six industries are all non-tradable goods: business and professional services, wholesale trade, hotel and lodging, automotive repair, freight transportation, and legal, engineering, accounting and related services. It is also noteworthy that the primary industry of transportation equipment dominated the secondary industry effects (table 4).

Table 5 lists the regional allocations of the secondary effects which are also displayed graphically in figure 11. These are again apportioned according to the level of employment and industry mix in each of the workforce board regions. An immediate observation from figure 11 is that the employment effects are much more evenly distributed than is the case for the primary effects. This is presumably due to the nature of the secondary industries identified: most are industries that are common to most segments of the economy and are correspondingly evenly distributed across the state.

Concluding Comments

Trade Adjustment Assistance is an important program for workers needing re-employment assistance as a result of potential domestic employment changes due to international trade. The level and distribution of imports across commodities in Florida have been identified in this report. Since TAA is a program intended to provide immediate assistance, a static approach has been used to relate the employment changes to the changes in levels of imports. This assumes no changes in technology as a result of the trade changes. Although there may be changes in technology over the longer term, the adjustment time period is too brief for technology to have a significant influence.

The direct employment effects reflect the proportionality of employment to production, and the employment adjustment reported is determined by the level of imports from free trade area countries in the year 2000, the most recent year with common data for imports, gross state product and employment. The industries with the five largest employment effects are agriculture, apparel and textiles, transportation equipment, miscellaneous manufacturing, and chemicals. The employment adjustment estimates are best evaluated as indicative of the probability of workers applying for TAA in a particular industry, or location. The larger the number, the more likely there would be an application from a particular industry. The numbers should *not* be interpreted as the number of workers expected to apply for TAA benefits. This is because much of the adjustment from the trade agreements has already taken place and is unlikely to shift dramatically without further significant changes in trade agreements, or longer term changes in comparative advantage due to technological change.

The secondary effects calculated via an input-output analysis reveal relatively large employment changes in secondary industries induced by increased imports among tradable goods. There is no question that a worker displaced from a secondary industry is any less important or worthy of assistance than a worker displaced from the primary industry. Although there may be some uniquely direct ties between industries, in many cases the very nature of secondary industries and effects is that they are far more amorphous and far more difficult to identify with a particular trade shift. The secondary industries are affected by numerous changes simultaneously, and this is borne out by the more even distribution across industries than in the case of the primary effects. Identifying workers from secondary industries for TAA may be very challenging in practice.

One set of changes not reflected in the data is the African Growth and Opportunity Act (AGOA) since it became effective after the period for analysis. However, examination of the trade data for 2001-2002 did not reveal many surprises. Apparel and textiles were significant among the imports under AGOA, a commodity already significant from the other trade areas. A future concern is the Free Trade Area of the Americas, FTAA. One of the larger commodity groups likely to be increasingly imported under FTAA is agricultural commodities, already the commodity with the largest estimated employment effect.

A more complete analysis, although beyond the scope of this brief project, would attempt to systematically model employment in the U.S. in response to imports from free trade areas. Such a model would relax many of the rather stringent assumptions of the current analysis. An

important example is considerations of the type of workers employed in an industry. There is some evidence that particular types of workers are less likely to have re-employment problems resulting from increased imports, or they are less likely to be dismissed in the event of a trade induced lay-off. One example is workers with computer skills (Addison, et al.).

References

Addison, J.T., D. Fox, and C. Ruhm. "Technology, Trade Sensitivity, and Labor Displacement". *Southern Economic Journal*. 66(2000):682-699.

Belman, D., and T. Lee. "International Trade and the Performance of U.S. Labor Markets." *U.S. Trade Policy and Global Growth: New Directions in the International Economy*. R. Blecker, ed. Armonk, N.Y.: M. E. Sharpe, 1996.

Blanchflower, D. "Globalization and the Labor Market." Paper commissioned by U.S. Trade Deficit Review Commission, Washington D.C. September. 2000.

Dickens, W. "The Effects of Trade on Employment: Techniques and Evidence." *The Dynamics of Trade and Employment*. L. D'Andrea Tyson, W. Dickens, and J. Zysman, eds., pp. 41-85. Cambridge, Mass.: Ballinger Publishing Co., 1988.

Grossman, G. "The Employment and Wage Effects of Import Competition in the United States." *Journal of International Economic Integration* 2(1987):1-23.

Mann, C. "The Effect of Foreign Competition in Prices and Quantities on the Employment in Import-Sensitive U.S. Industries." *International Trade Journal* 2(1988):409-444.

Revenga, A. "Exporting Jobs? The Impact of Import Competition on Employment and Wages in U.S. Manufacturing." *Quarterly Journal of Economics* 107(1992):255-284.

Ricardo, David. *On the Principles of Political Economy and Taxation.* London: Dent, 1957. (original 1819).

U.S. Department of Commerce. Bureau of Economic Analysis. http://www.bea.gov/bea/dn2/i-o.htm

U.S. Department of Labor. Employment and Training Administration. http://www.doleta.gov/tradeact/2002act_index.cfm 2003.

U.S. International Trade Commission. USITC Interactive Tariff and Trade DataWeb. http://dataweb.usitc.gov

Table 1. Florida product, imports, and import penetration ratios by sector, 2000

Industry	SIC	Gross State Product[a]	Imports through Florida Ports[b]			Import Penetration Ratios		
			All	From Trade Agreement Countries		All Imports	Trade Agreement Countries	
				All	Trade Preference		All	Trade Preference
		Million Dollars						
Total Gross State Product		472,105[c]	38,007	13,530	2,246	0.07	0.02	0.00
Farms	01-02	4,157	1,396	1,155	744	0.25	0.20	0.13
Agricultural services, forestry and fishery	07-09	3,927	1,354	656	8	0.25	0.12	0.00
Metal mining	10	31	0	0	0	0.00	0.00	0.00
Coal mining	12	2	45	41	0	0.95	0.87	0.00
Oil and gas	13	81	25	0	0	0.24	0.00	0.00
Nonmetalic minerals	14	785	91	62	0	0.10	0.07	0.00
Construction	15-17	25,357	0	0	0	0.00	0.00	0.00
Food & kindred products	20	4,542	1,130	163	128	0.19	0.02	0.02
Tobacco products	21	180	277	184	182	0.60	0.40	0.39
Textile mill products	22	116	330	251	6	0.74	0.56	0.01
Apparel and textile	23	593	7,673	7,032	108	0.92	0.85	0.01
Lumber and wood	24	1,159	277	68	24	0.19	0.04	0.01
Furniture and fixtures	25	486	516	50	0	0.51	0.05	0.00
Paper products	26	1,016	420	140	16	0.29	0.09	0.01
Printing and publishing	27	3,236	45	8	0	0.01	0.00	0.00
Chemicals	28	3,044	1,203	595	340	0.28	0.14	0.08
Petroleum products	29	343	1,217	395	16	0.78	0.25	0.01
Rubber and plastics	30	907	428	87	76	0.32	0.06	0.05
Leather products	31	123	709	116	72	0.85	0.13	0.08
Stone, clay, glass	32	1,749	626	79	26	0.26	0.03	0.01
Primary metals	33	457	709	276	26	0.60	0.23	0.02
Fabricated metals	34	2,054	438	26	13	0.17	0.01	0.00
Industrial machinery	35	2,190	2,374	819	5	0.52	0.17	0.00
Electronic equipment	36	4,584	2,287	460	59	0.33	0.06	0.00
Transportation equipment	37	3,589	11,173	257	205	0.75	0.01	0.01
Instruments and related	38	1,695	993	376	40	0.36	0.13	0.01
Miscellaneous manufacturing	39	526	913	222	142	0.63	0.15	0.09

continued

Table 1. Florida product, imports, and import penetration ratios by sector, 2000, continued

[a]Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC. http://www.bea.gov/bea/regional/gsp/
[b]U.S. International Trade Commission, Washington, DC. http://dataweb.usitc.gov
[c]Includes nontradable goods not separately itemized.

Table 2. Direct employment estimates, 2000 Florida imports

Industry	SIC	Gross State Product	Trade Agreement Imports through Florida Ports	Florida Employment[a]	Employment Share	Direct Employment Impact
		-------Million Dollars-------			Percent	
Total Gross State Product		472,105	2,246	7,059,980		
Farms	01-02	4,157	744	62,749	0.89	11,238
Agricultural services, forestry and fishery	07-09	3,927	9	94,425	1.34	209
Metal mining	10	31	0	398	0.01	0
Oil and gas	13	81	0	489	0.01	0
Nonmetalic minerals	14	785	0	5,473	0.08	2
Construction	15-17	25,357	0	397,903	5.64	0
Food and kindred products	20	4,542	128	41,139	0.58	1,162
Tobacco products	21	180	182	1,951	0.03	1,974
Textile mill products	22	116	7	3,539	0.05	206
Apparel and textile	23	593	109	18,199	0.26	3,335
Lumber and wood	24	1,159	25	22,081	0.31	475
Furniture and fixtures	25	486	0	12,288	0.17	7
Paper products	26	1,016	16	12,842	0.18	208
Printing and publishing	27	3,236	1	64,902	0.92	13
Chemicals	28	3,044	340	21,944	0.31	2,453
Petroleum products	29	343	16	2,112	0.03	99
Rubber and plastics	30	907	76	18,181	0.26	1,526
Leather products	31	123	72	1,911	0.03	1,122
Stone, clay, glass	32	1,749	26	24,358	0.35	363
Primary metals	33	457	26	6,631	0.09	384
Fabricated metals	34	2,054	13	36,211	0.51	235
Industrial machinery	35	2,190	6	36,987	0.52	99
Electronic equipment	36	4,584	60	62,175	0.88	811
Transportation equipment	37	3,589	205	52,857	0.75	3,024
Instruments and related	38	1,695	40	35,536	0.50	847
Miscellaneous manufacturing	39	526	143	10,153	0.14	2,752
Total (above industries only)		66,927	2,244	1,047,434	14.84	32,544

[a]Florida Agency for Workforce Innovation, Tallahassee, Florida. http://fred.labormarketinfo.com

Table 3. Direct employment effects by region

Work Force Board	Counties	Direct Employment Effect
1	Escambia and Santa Rosa	842
2	Okaloosa and Walton	184
3	Calhoun, Holmes, Jackson, Liberty and Washington	269
4	Bay, Franklin and Gulf	143
5	Gadsden, Leon and Wakulla	477
6	Hamilton, Jefferson, Lafayette, Madison, Suwannee and Taylor	465
7	Columbia, Dixie, Gilchrist and Union	150
8	Baker, Clay, Duval, Nassau, Putnam and St. Johns	3,134
9	Alachua and Bradford	333
10	Citrus, Levy, and Marion	908
11	Flagler and Volusia	980
12	Orange, Osceola, Seminole, Lake and Sumter	2,817
13	Brevard	834
14	Pinellas	1,666
15	Hillsborough	3,588
16	Hernando and Pasco	296
17	Polk	1,316
18	Manatee and Sarasota	1,561
19	DeSoto, Hardee and Highlands	604
20	Indian River, Martin, Okeechobee and St. Lucie	1,196
21	Palm Beach	2,356
22	Broward	1,628
23	Dade and Monroe	5,297
24	Charlotte, Collier, Glades, Hendry and Lee	1,988

Table 4. Secondary employment effects

Secondary Industry	IO Code	Primary Industry										Sum
		01+ 02	28	30	39	20+ 21	36	38	22+ 23	59A+ 59B+ 61	31	
Other business and professional services, except medical	73C	355	319	29	5	131	60	894	7	7,084	303	9,187
Wholesale trade	69A	257	167	19	4	110	28	609	5	5,563	127	6,889
Hotels and lodging places	72A	0	52	5	1	22	9	139	1	1,317	42	1,589
Automotive repair and services	75	0	0	0	0	0	0	0	0	1,508	0	1,508
Motor freight transportation and warehousing	65B	74	55	7	1	32	26	171	1	1,084	0	1,450
Legal, engineering, accounting, and related services	73B	0	106	7	1	0	0	114	1	1,113	85	1,427
Motor vehicles, trucks, buses, other transportation equipment	59A + 59B+61	0	0	0	0	0	0	0	0	1,406	0	1,406
New Construction; Maintenance and repair construction	11+12	0	58	4	1	0	10	138	1	974	100	1,286
Primary metals manfg.; screw machine products & stampings	37+38 +41	0	0	0	2	0	0	175	0	915	0	1,092
Agricultural, forestry, and fishery services	04	841	0	0	0	91	0	0	0	0	0	932
Eating and drinking places	74	0	0	3	0	0	0	0	0	861	0	864
Rubber and miscellaneous plastics products	32	0	0	0	0	0	0	0	0	713	0	713
Air transportation	65D	0	0	0	0	0	0	0	0	701	0	701
Electronic components and accessories	57	0	0	0	0	0	0	0	0	666	0	666
Finance	70A	0	0	0	0	0	0	0	0	628	0	628
Educational and social services, and membership organizations	77B	0	0	0	0	0	0	0	0	600	0	600
State and local government enterprises	79	0	0	0	0	0	0	0	0	590	0	590
Farms	01+02	424	0	0	0	0	0	0	0	0	0	424

Table 5. Secondary employment effects by region

Work Force Board	Counties	Secondary Employment Effect
1	Escambia and Santa Rosa	592
2	Okaloosa and Walton	347
3	Calhoun, Holmes, Jackson, Liberty and Washington	61
4	Bay, Franklin and Gulf	264
5	Gadsden, Leon and Wakulla	469
6	Hamilton, Jefferson, Lafayette, Madison, Suwannee and Taylor	104
7	Columbia, Dixie, Gilchrist and Union	80
8	Baker, Clay, Duval, Nassau, Putnam and St. Johns	2,759
9	Alachua and Bradford	381
10	Citrus, Levy, and Marion	611
11	Flagler and Volusia	645
12	Orange, Osceola, Seminole, Lake and Sumter	4,258
13	Brevard	1,020
14	Pinellas	2,346
15	Hillsborough	3,464
16	Hernando and Pasco	319
17	Polk	860
18	Manatee and Sarasota	1,483
19	DeSoto, Hardee and Highlands	188
20	Indian River, Martin, Okeechobee and St. Lucie	619
21	Palm Beach	2,035
22	Broward	2,991
23	Dade and Monroe	4,834
24	Charlotte, Collier, Glades, Hendry and Lee	1,221

Figure 1. Direct Employment Sensitivity

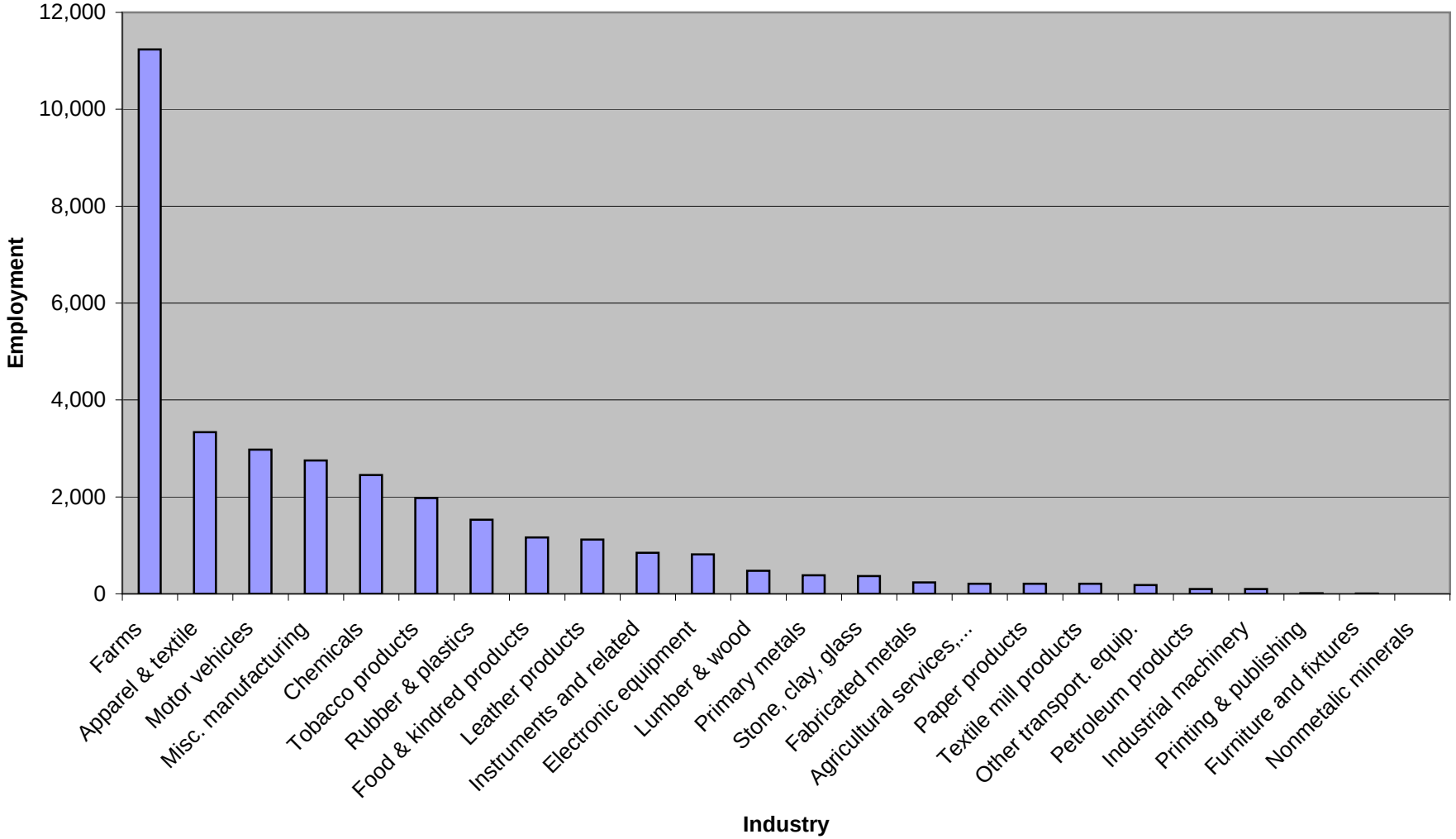

Figure 2. Regional Workforce Boards

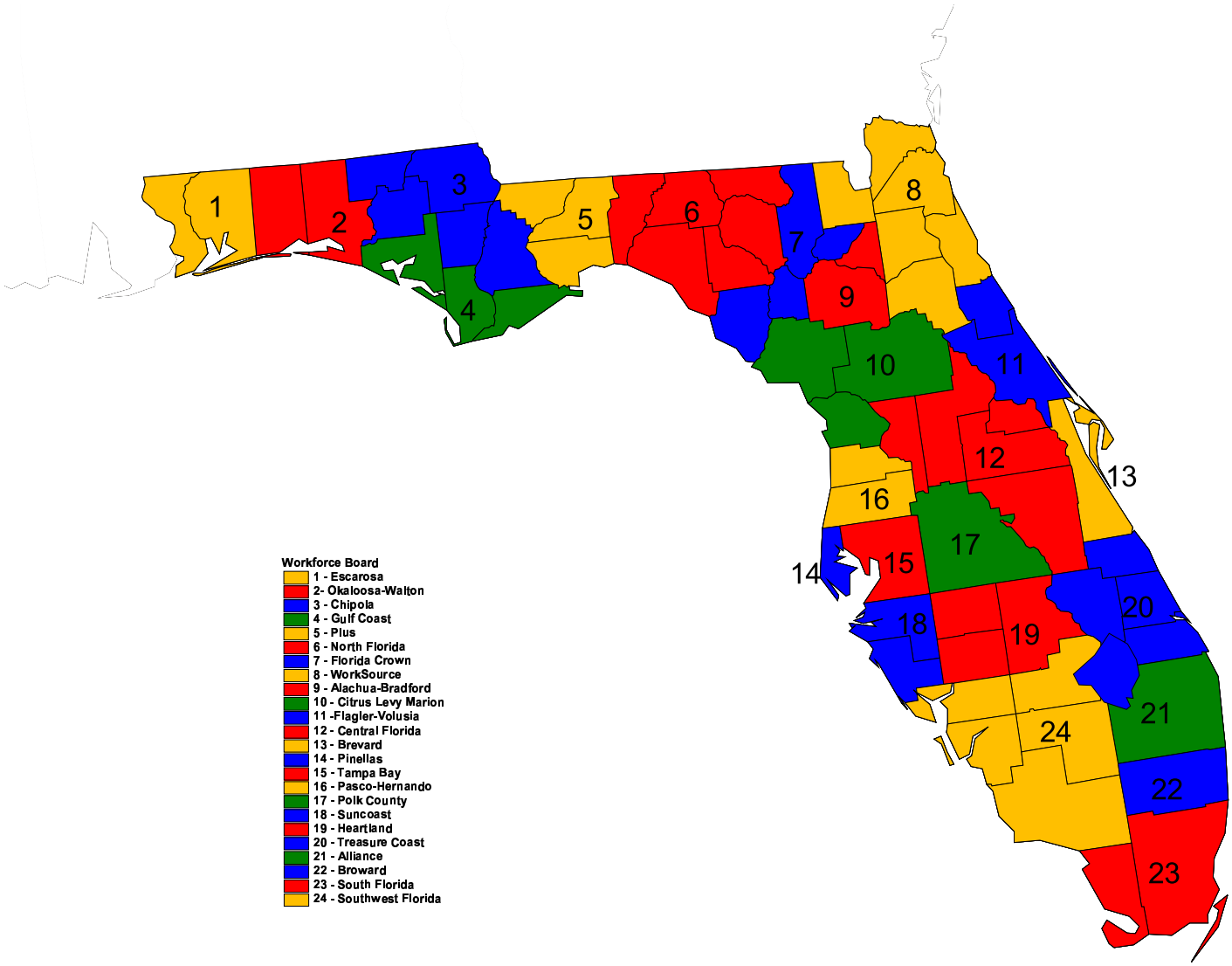

Figure 3. Direct Employment Effect

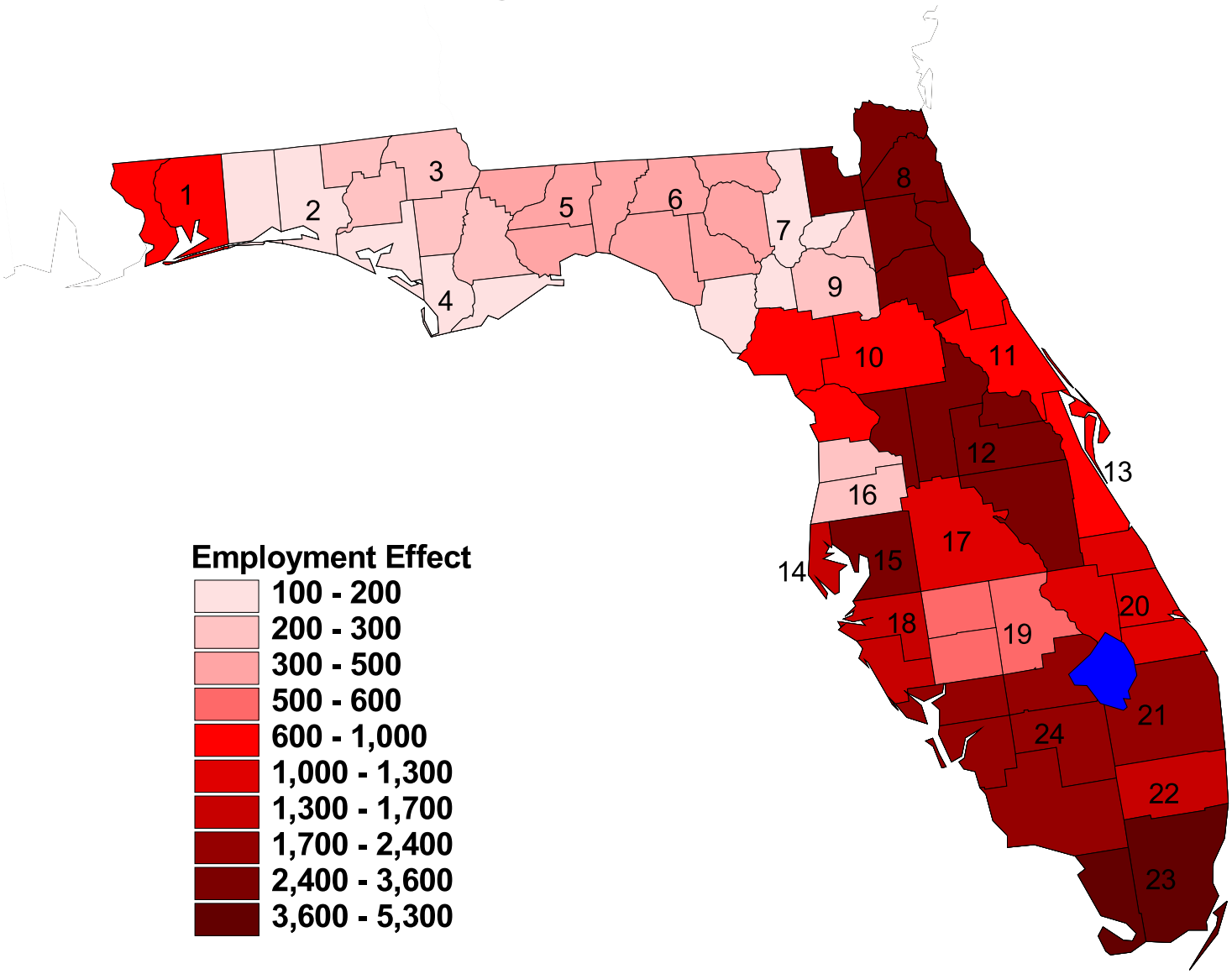

Figure 4. Direct Employment Sensitivity

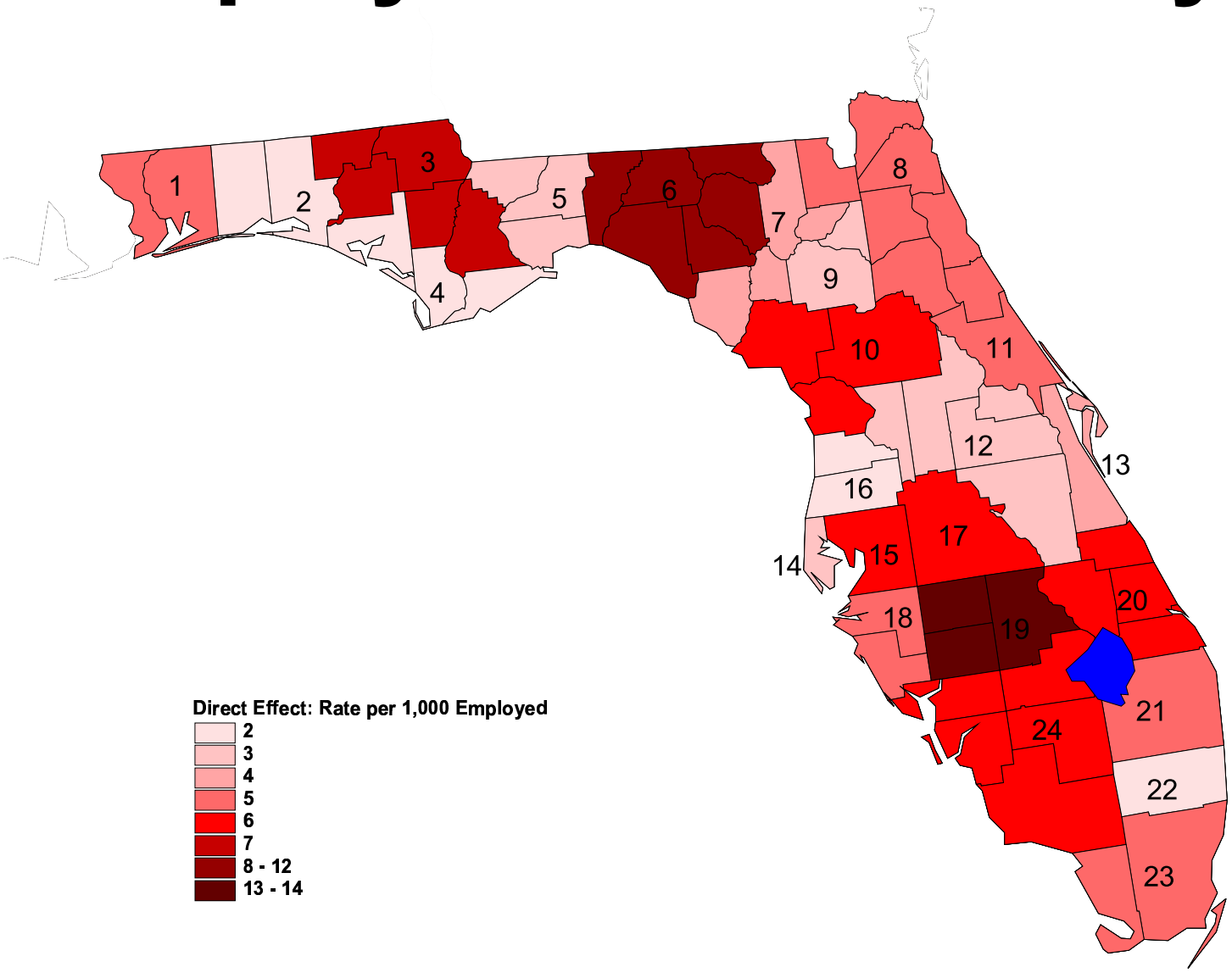

Figure 5.
Most Sensitive Industry

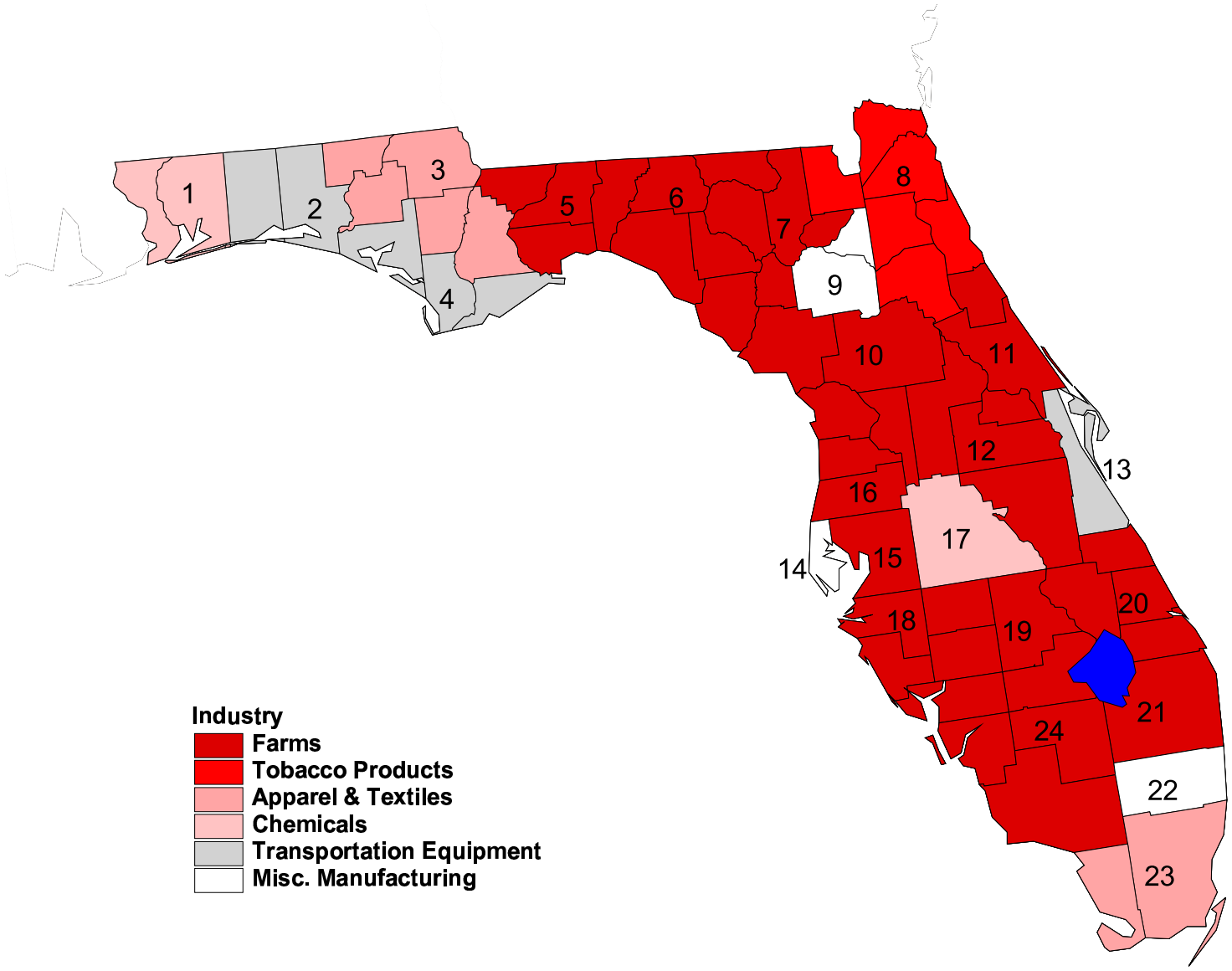

Figure 6. Second Most Sensitive Industry

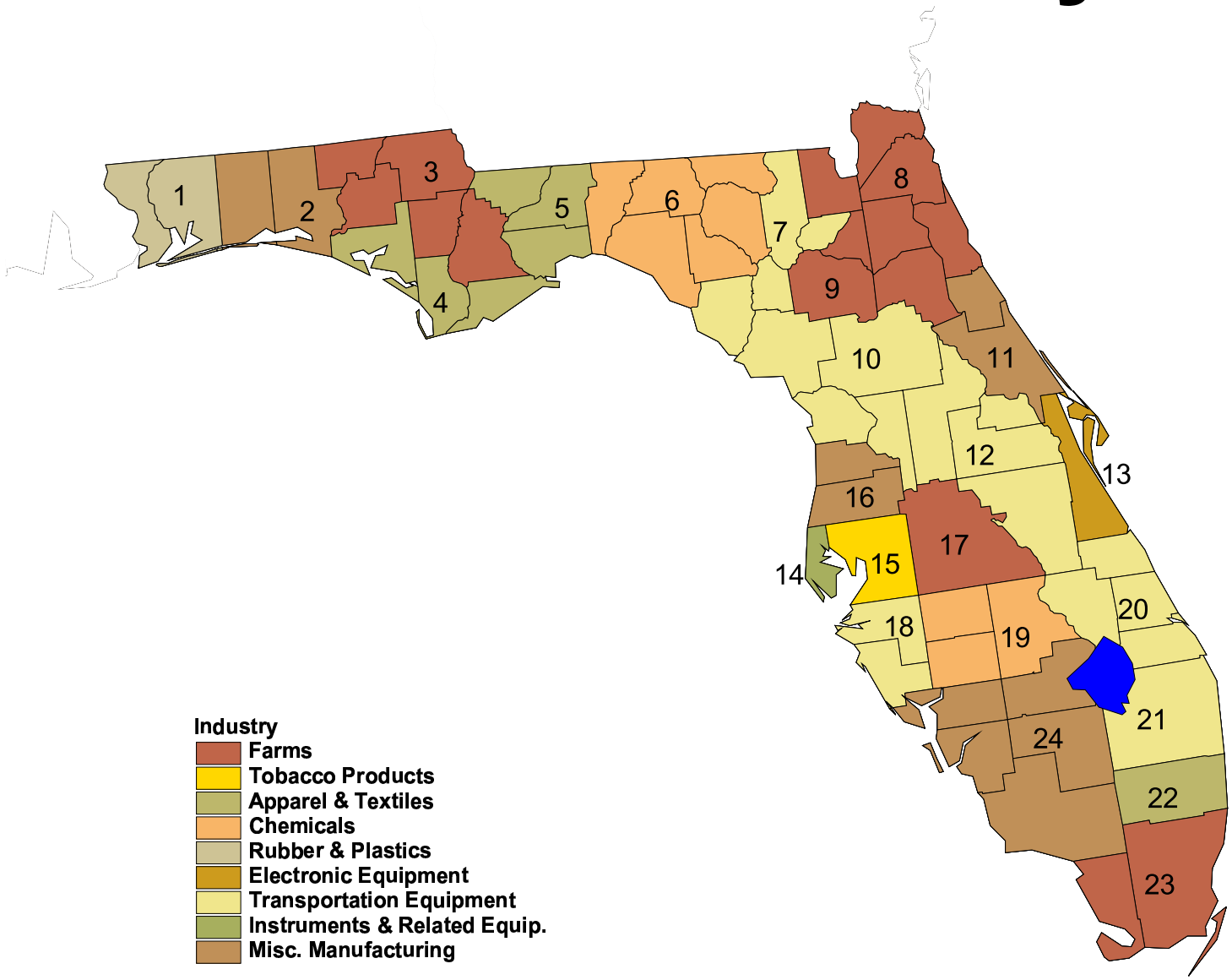

Figure 7. Regional Farm Employment Effects

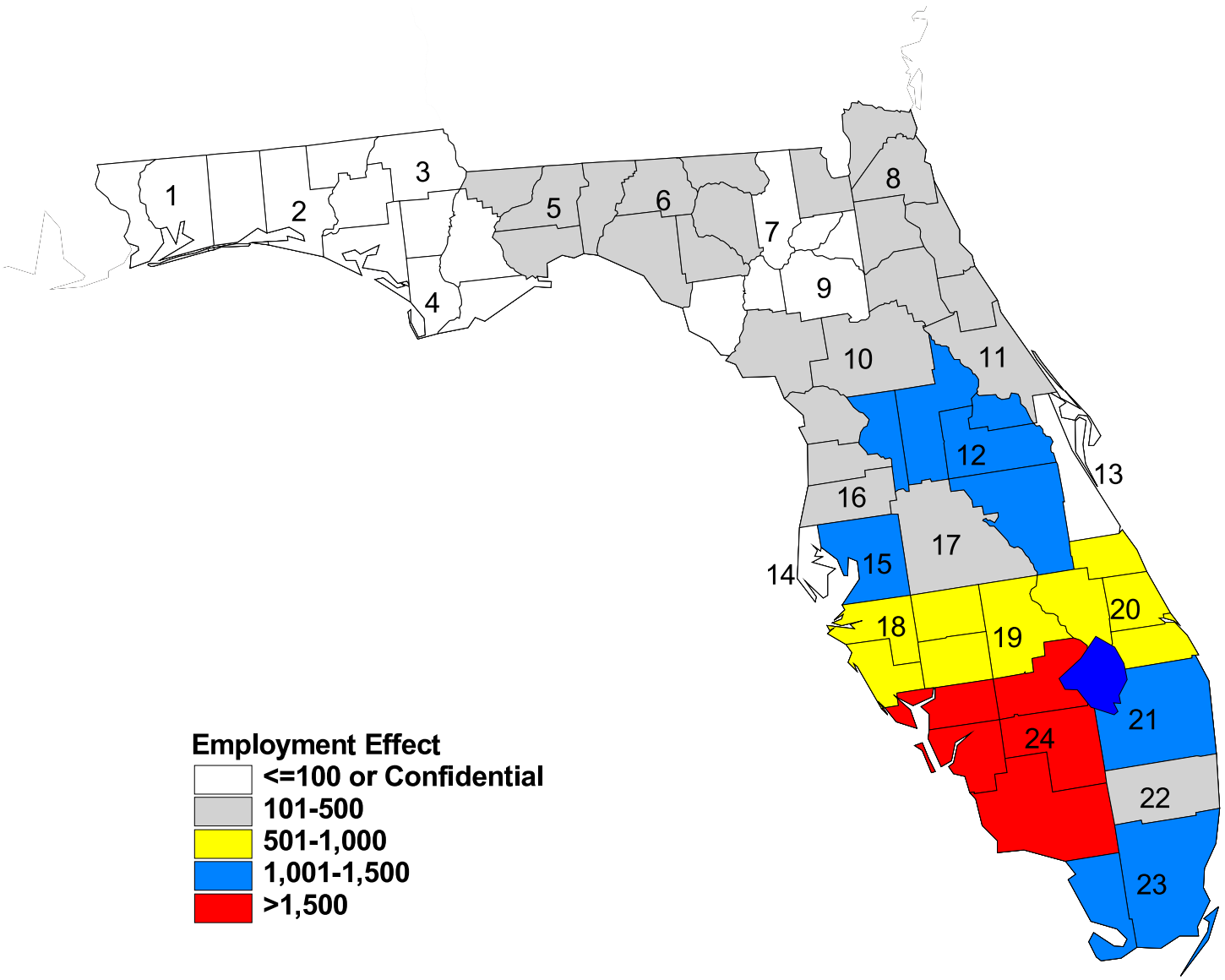

Figure 8. Regional Apparel Employment Effects

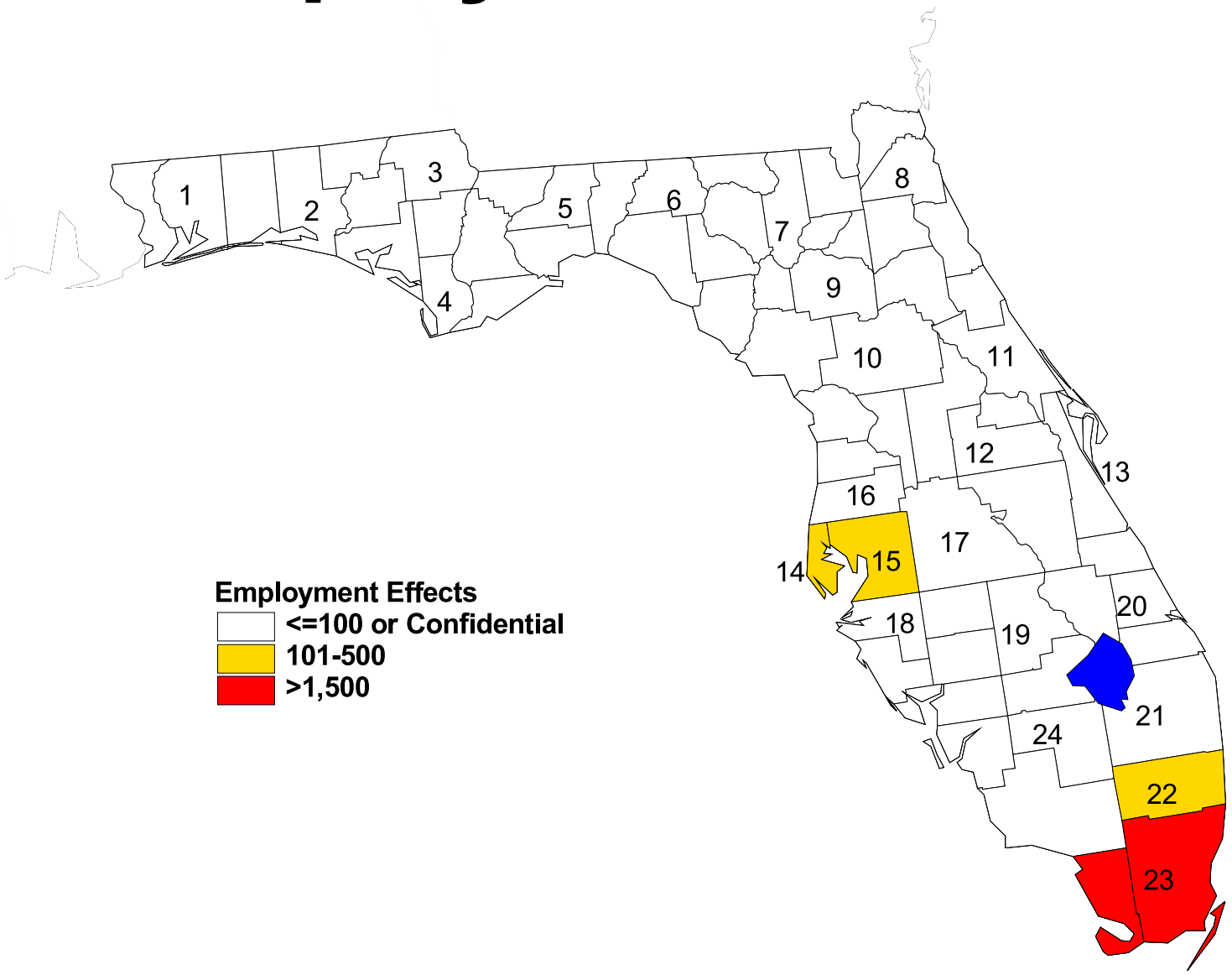

Figure 9. Regional Transportation Equipment Employment Effects

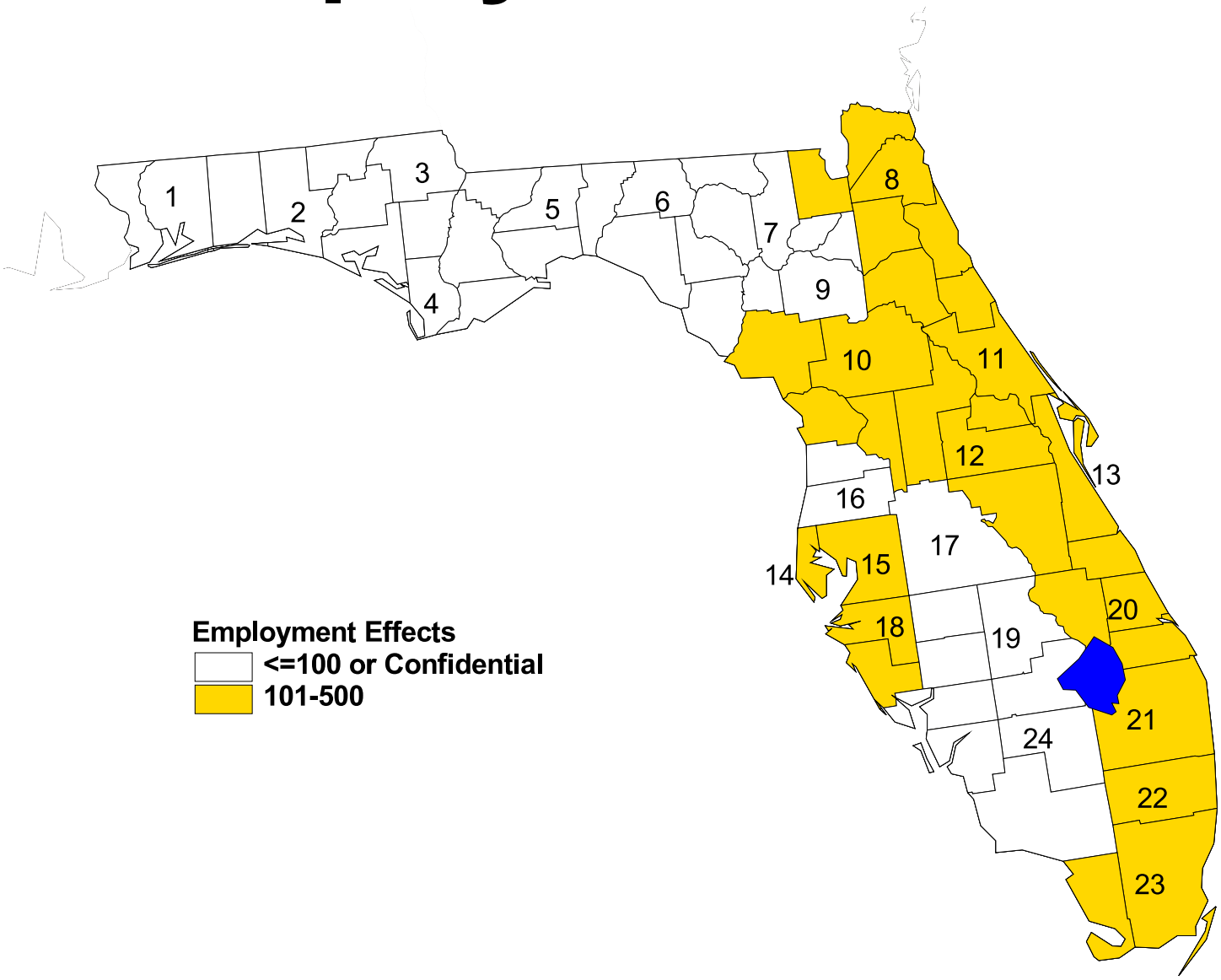

Figure 10. Secondary Employment Effects

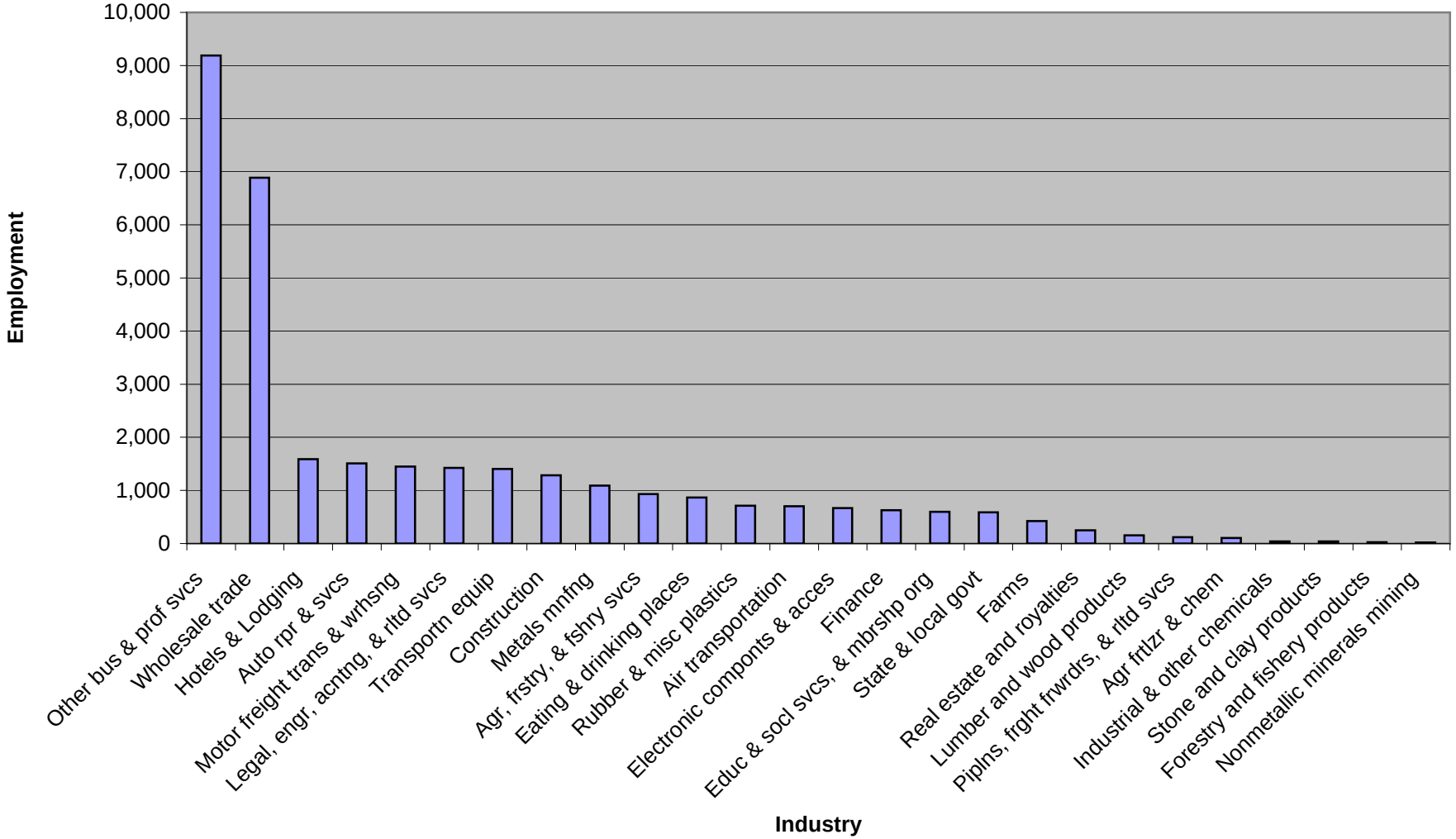

Figure 11. Regional Secondary Employment