Economic Contributions of
FOREST PRODUCT MANUFACTURING
Fernandina Beach, Florida

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Sponsored Project Report:
RYAM, Smurfit Westrock, and LignoTech

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CONTENTS

Executive Summary 3

Table ES1. Summary of economic contributions of forest product manufacturing in Fernandina Beach, Florida, within Nassau County and within the Florida-Georgia wood resource region, 2023 3

Introduction 5

Figure 1. Location map of Fernandina Beach, Florida, and company locations on Amelia Island 5

Regional Economic Profile and Trends 6

Figure 2. Population, employment, and GDP growth in the Jacksonville Florida MSA 7

Figure 3. Profile of industry employment and value added in Nassau County, Florida, 2022 8

Figure 4. Trend in employment and value added for forest industry sectors in Nassau County, Florida, 2017–22 9

Data and Methods 11

Company Data 11

Table 1. Raw material consumed and annual product volumes of each Fernandina Beach forest manufacturing entity 11

Table 2. Employment for each Fernandina Beach forest manufacturing entity 11

Table 3. Capital expenditures for buildings and equipment by each Fernandina Beach forest manufacturing entity 11

Figure 5. Map of the Jacksonville FL MSA, and Florida and Georgia counties in the wood resource procurement region for forest product manufacturing companies in Fernandina Beach, Florida 12

Regional Economic Modeling and Analysis Methods 12

Economic Contribution Results 13

Summary for the Florida-Georgia Wood Resource Region 13

Table 4. Summary of economic contributions of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region 13

Table 5. Summary of economic contributions of forest product manufacturing in Fernandina Beach within Nassau County, Florida 14

Figure 6. Employment, output, value added, and tax contributions of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region 15

Summary for Nassau County 16

Figure 7. Employment, output, value added, and tax contributions of forest product manufacturing in Fernandina Beach within Nassau County, Florida 17

Economic Contributions by Industry Group 18

Table 6. Economic contributions by major industry group of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region 18

Figure 8. Employment and value added contributions by industry group of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region 19

Table 7. Economic contributions by major industry group of forest product manufacturing in Fernandina Beach within Nassau County, Florida 20

Figure 9. Employment and value added contributions by industry group of forest product manufacturing in Fernandina Beach within Nassau County, Florida 21

Government Tax Impacts 23

Table 8. Local, state, and federal tax impacts of forest product manufacturing in Fernandina Beach, within the Florida-Georgia wood resource region 23

Table 9. Local, state and federal tax impacts of forest product manufacturing in Fernandina Beach within Nassau County, Florida 24

Literature and Information Sources Cited 25

Appendix: Glossary of Economic Impact Terms 25

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EXECUTIVE SUMMARY

The community of Fernandina Beach, Florida is home to three forest product manufacturing operations: *Rayonier Advanced Materials Inc. ("RYAM")* produces high-purity cellulose fibers; *Smurfit Westrock* produces paperboard and packaging materials; *LignoTech Florida, LLC ("LignoTech")* produces lignosulfonates products. The RYAM and Smurfit Westrock mills source wood fiber from forests across northeast Florida and southeast Georgia, while LignoTech utilizes byproducts from the RYAM mill under a joint venture agreement.

This report presents results of an economic contribution assessment for these forest product companies, updating the results of a previous study for 2015. The analysis considered annual operating revenues and employment in 2023–24, and capital improvement expenditures during the three year period 2021–23. The three companies reported combined direct employment of 1,445 full-time equivalent employees and $136 million in capital improvements.

Economic contributions were estimated for Nassau County, Florida, and for the 41-county wood resource region in NE-FL/SE-GA, using regional economic models constructed with the IMPLAN software (IMPLAN Group LLC). The models enable estimation of multiplier effects of industry supply chain activity (indirect effects) and re-spending of income by employee households (induced effects) as well as direct effects of operating revenues, employment, and capital improvements.

Results are summarized in Table ES1. In the Florida-Georgia wood resource region, the three companies supported 4,977 full-time and part-time jobs, $1.711 billion in industry output or revenues, $703 million in value added contributions to Gross Domestic Product (GDP), including $400 million in labor income (employee wages, salaries, benefits and proprietor income), and $156 million in local, state, and federal taxes. In Nassau County, the economic contributions were 2,883 jobs, $1.218 billion in output, $442 million in value added, and $90.0 million in taxes.

Employment and value added contributions within the region for the respective companies were 1,080 jobs and $145 million for the pulp mill (RYAM), 3,054 jobs and $459 million for the paperboard mill (Smurfit Westrock), 354 jobs and $46.6 million for the paperboard container plant (Smurfit Westrock), 162 jobs and $21.3 million for lignin manufacturing (LignoTech), and 327 jobs and $31.1 million for combined capital improvements to buildings and equipment.

Economic contributions of forest product manufacturing by the three firms in Nassau County represented 6.6 percent of total county employment and 9.6 percent of county GDP in 2023.

Table ES1. *Summary of economic contributions of forest product manufacturing in Fernandina Beach, Florida, within Nassau County and within the Florida-Georgia wood resource region, 2023.*

	Employment (Jobs)		Output (M$)		Value Added (M$)		Local, State, Federal Taxes (M$)	
Activity (Company)	**Region**	**County**	**Region**	**County**	**Region**	**County**	**Region**	**County**
Pulp mill (RYAM)	1,080	659	$370.6	$269.0	$144.6	$91.3	$32.2	$19.2
Paperboard mill (Smurfit Westrock)	3,054	1,881	$1,056.4	$781.5	$459.3	$314.6	$100.2	$62.8
Paperboard container plant (Smurfit Westrock)	354	216	$138.1	$105.2	$46.6	$30.8	$10.9	$6.7
Lignin manufacturing (LignoTech)	162	101	$72.9	$59.2	$21.3	$3.9	$4.9	$0.9
Capital improvements-Buildings (all companies)	29	25	$4.6	$3.4	$2.3	$1.6	$0.6	$0.4
Capital improvements-Equipment (all companies)	297	N/A	$68.6	N/A	$28.7	N/A	$7.2	N/A
Total	**4,977**	**2,883**	**$1,711.3**	**$1,218.3**	**$702.8**	**$442.2**	**$156.0**	**$90.0**

Values in millions of 2023 dollars. Results include regional multiplier effects. Employment represents full-time and part-time jobs.
Source: IMPLAN models for Nassau County and 41-county wood resource region in Florida and Georgia, 2022 (IMPLAN Group LLC).

Photo credit: RYAM.

INTRODUCTION

The community of Fernandina Beach, Florida is home to three forest product manufacturing firms: Rayonier Advanced Materials (RYAM), Smurfit Westrock, and LignoTech Florida LLC.

RYAM is a manufacturer of specialty cellulose products that was spun off from Rayonier Inc. in 2014, which retained the forest landholdings. RYAM produces over 25 grades of high-purity cellulose fibers used in a wide array of consumer and technical products, including absorbents, filters, foods, cosmetics, pharmaceuticals, paints, impact-resistant plastics, and digital display screens. For operations at its Fernandina Beach, Florida and Jesup, Georgia facilities, RYAM sources wood fiber from forests across northeast Florida and southeast Georgia.

Smurfit Westrock is a paperboard (linerboard) packaging manufacturer that was formed in May 2015 through the merger of MeadWestvaco and Rock Tenn, with executive offices located in Norcross, Georgia. Smurfit Westrock is the second largest paper packaging manufacturer in the United States. Globally, the company has $15 billion in annual revenues and 42,000 employees in 30 countries. The Smurfit Westrock mill in Fernandina Beach also sources wood fiber from forests across northeast Florida and southeast Georgia.

LignoTech is a manufacturer of refined lignin, a constituent of wood extracted from wood pulp, which is sourced from the adjacent RYAM sulfite pulp mill under a joint venture with Borregaard ASA. Operations at the Fernandina Beach plant began in June 2018. The plant has a maximum annual production capacity of 100,000 dry metric tons lignin, and it distributes both liquid and solid products to specialty chemicals markets globally.

Fernandina Beach is located on the Atlantic coast in Nassau County along the Florida-Georgia border in northeast Florida, on the northern tip of Amelia Island, at the mouth of the St. Marys River draining from the Okefenokee Swamp and National Wildlife Refuge (Figure 1). The area has a rich history of Spanish, French, British, and American occupation going back to the 16th century. Today, it is a popular tourism and retirement destination known for luxury resorts, golf courses, beaches, a National Historic District, and Fort Clinch State Park. In recent years, conflicts between local residents and the forest product manufacturing companies have arisen over issues of noise, emissions, and traffic generated by the mills/plants. This report was prepared at the request of the three companies to evaluate their economic contributions in the region, in support of informed public policy.

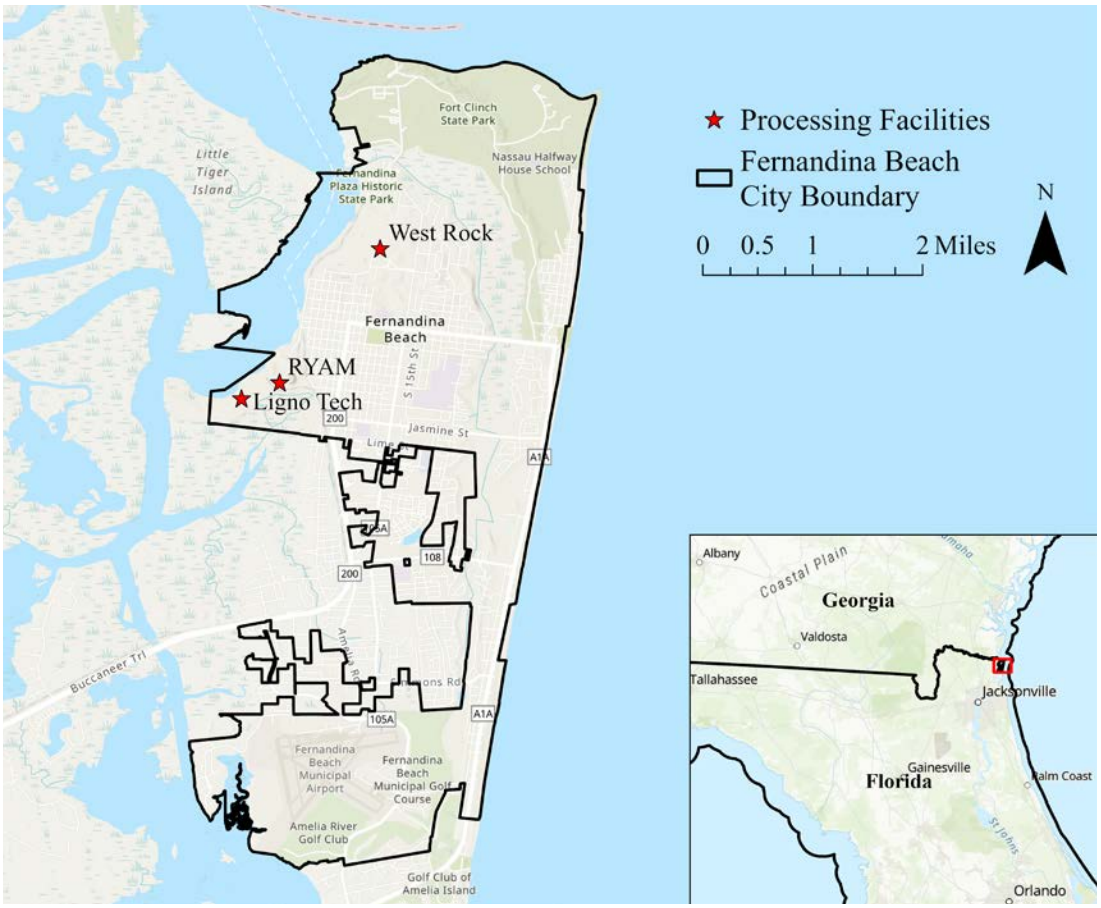


Figure 1. *Location map of Fernandina Beach, Florida, and company locations on Amelia Island.*

Regional Economic Profile and Trends

Economic information for Nassau County and the Jacksonville Florida Metropolitan Statistical Area (MSA), comprised of Nassau, Duval, Clay, Baker, and St. Johns Counties, is presented in this section to provide background and context for the economic contribution analysis of forest manufacturing in Fernandina Beach, Florida. The population of the Jacksonville MSA grew from 1.126 million in the year 2000 to 1.676 million in 2022, representing a 49 percent increase, or average annual growth rate of 2.32 percent, and employment in the area also grew by 49 percent during this period (Figure 2). Gross Domestic Product (GDP) in the MSA grew from $80.34 billion in 2017 to $99.47 billion in 2022 or 4.76 percent annually, in constant-dollar terms (Figure 2).

A profile of employment and value added in Nassau County is shown in Figure 3. Total employment in the County in 2022 was 39,959 full-time and part-time jobs, with leading sectors including Accommodation-Food Services (4,693 jobs), Retail Trade (4,549 jobs), Administrative Government-Military (3,358 jobs), Other Services (3,225 jobs), and Health Care-Social Assistance (3,136 jobs). Total value added or GDP in the County in 2022 was $3.903 billion, with leading sectors of Real Estate-Rentals ($879 million), Manufacturing ($405 million), Government ($388 million), and Accommodation-Food Services ($319 million).

Trends in forest industry employment and value added in Nassau County during 2017–22 are charted in Figure 4. Overall forest industry employment in 2022 was 1,570 jobs, including individual sectors of paperboard mills (535 jobs), commercial logging (354 jobs), sawmills (195 jobs), paperboard container manufacturing (181 jobs), pulp mills (174 jobs), forestry and timber production (111 jobs), and paper bag-treated/coated paper manufacturing (21 jobs). Total forest industry employment increased 68 percent during 2017–22, with higher rates for sawmills (145%), logging (129%), and paperboard mills (70%), though it was lower for pulp mills (42%) and paperboard container manufacturing (13%). Forest industry output or business revenues in the County in 2022 was $896 million, and value added (GDP) was $261 million, dominated by paperboard mills ($160 million), pulp mills ($35 million), and paperboard container manufacturing ($30 million). Value added growth during 2017–22 was moderate for pulp mills (17%), high for paperboard mills (64%) and paperboard container manufacturing (44%), and very high for sawmills (373%), though this sector declined significantly in 2022.

Photo credit: RYAM.

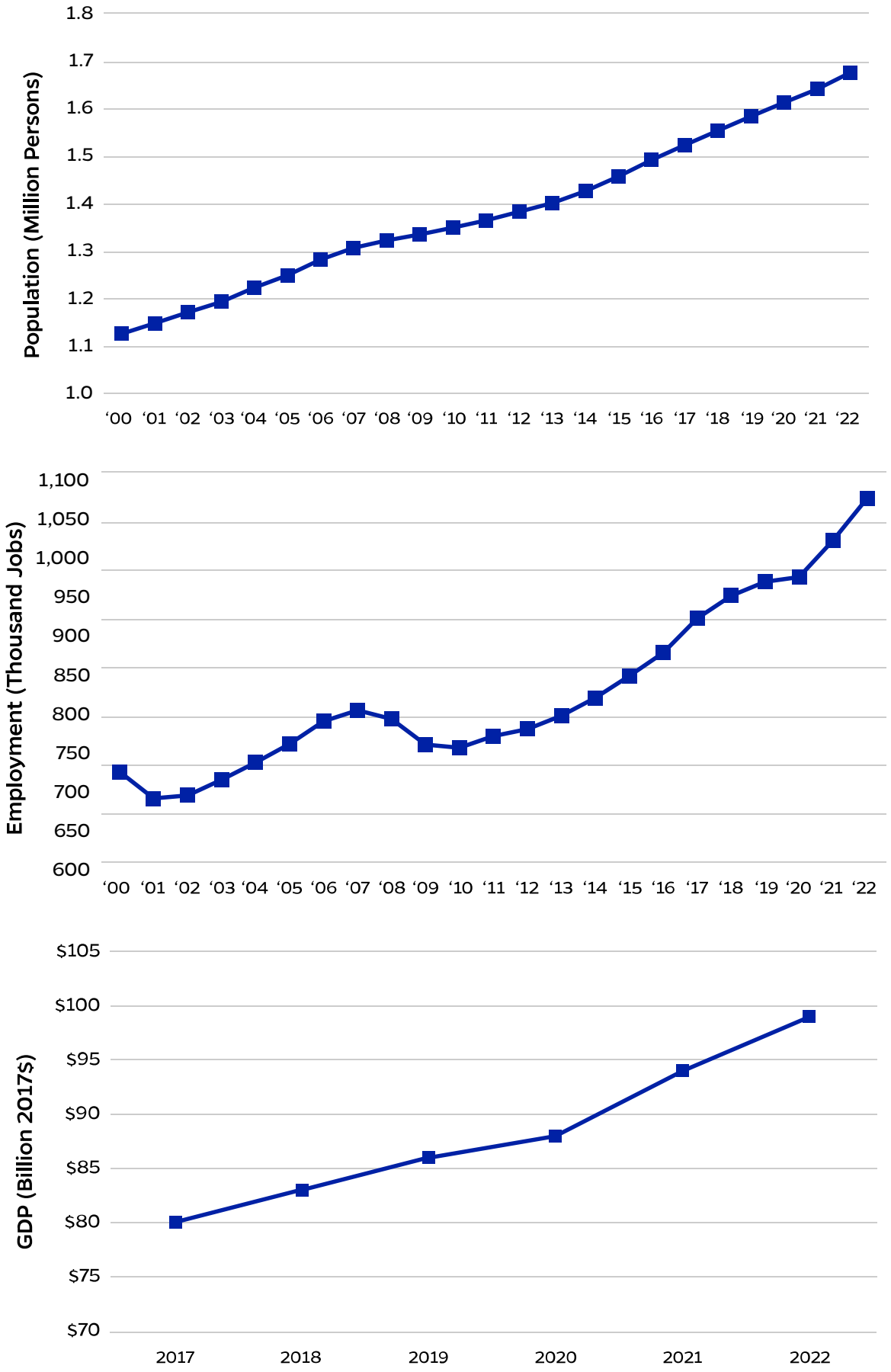


Figure 2. *Population, employment, and GDP growth in the Jacksonville Florida MSA.*
Source: U.S. Commerce Department, Bureau of Economic Analysis, data for Jacksonville FL MSA.

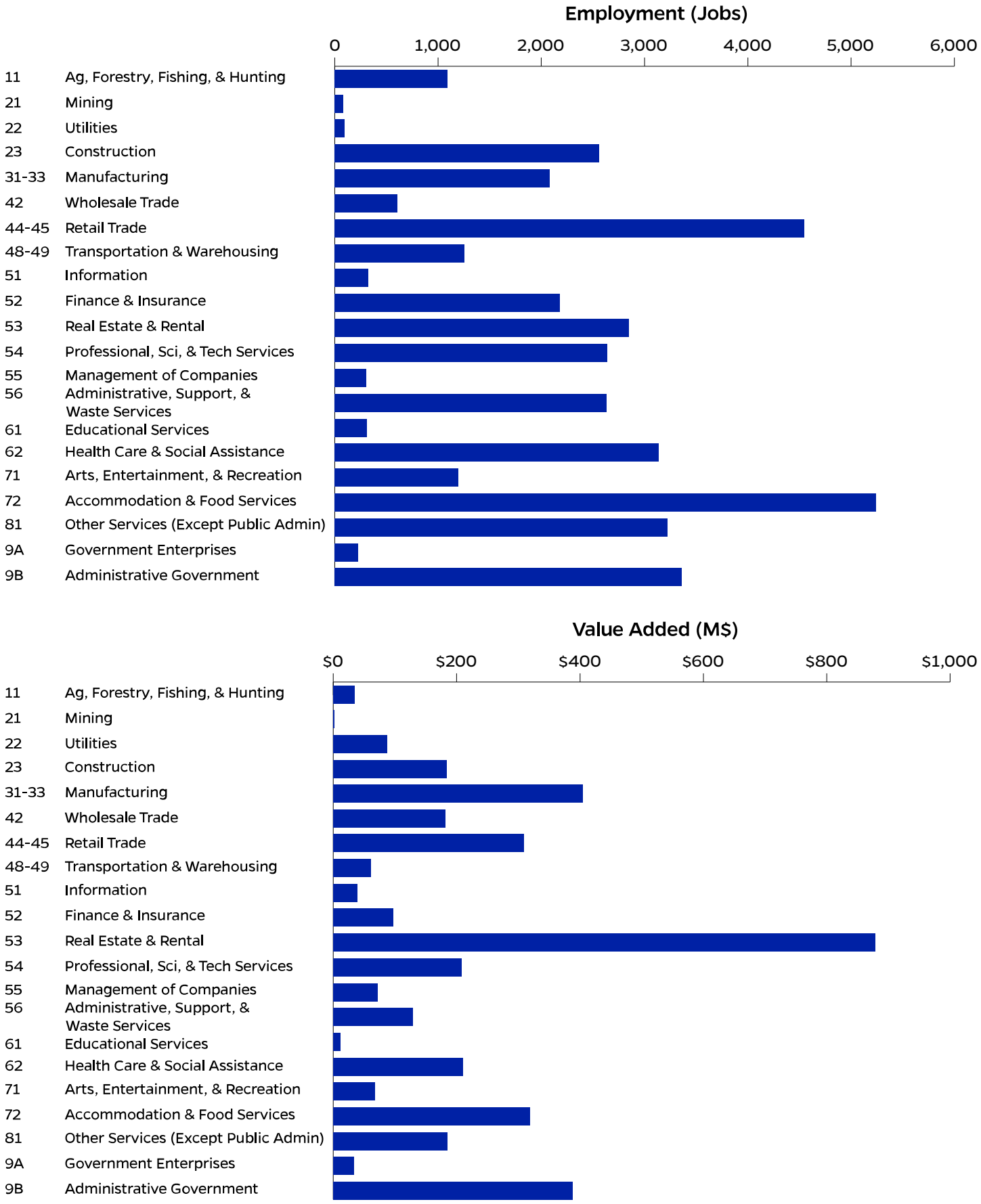


Figure 3. *Profile of industry employment and value added in Nassau County, Florida, 2022. Source: IMPLAN county data (IMPLAN Group LLC).*

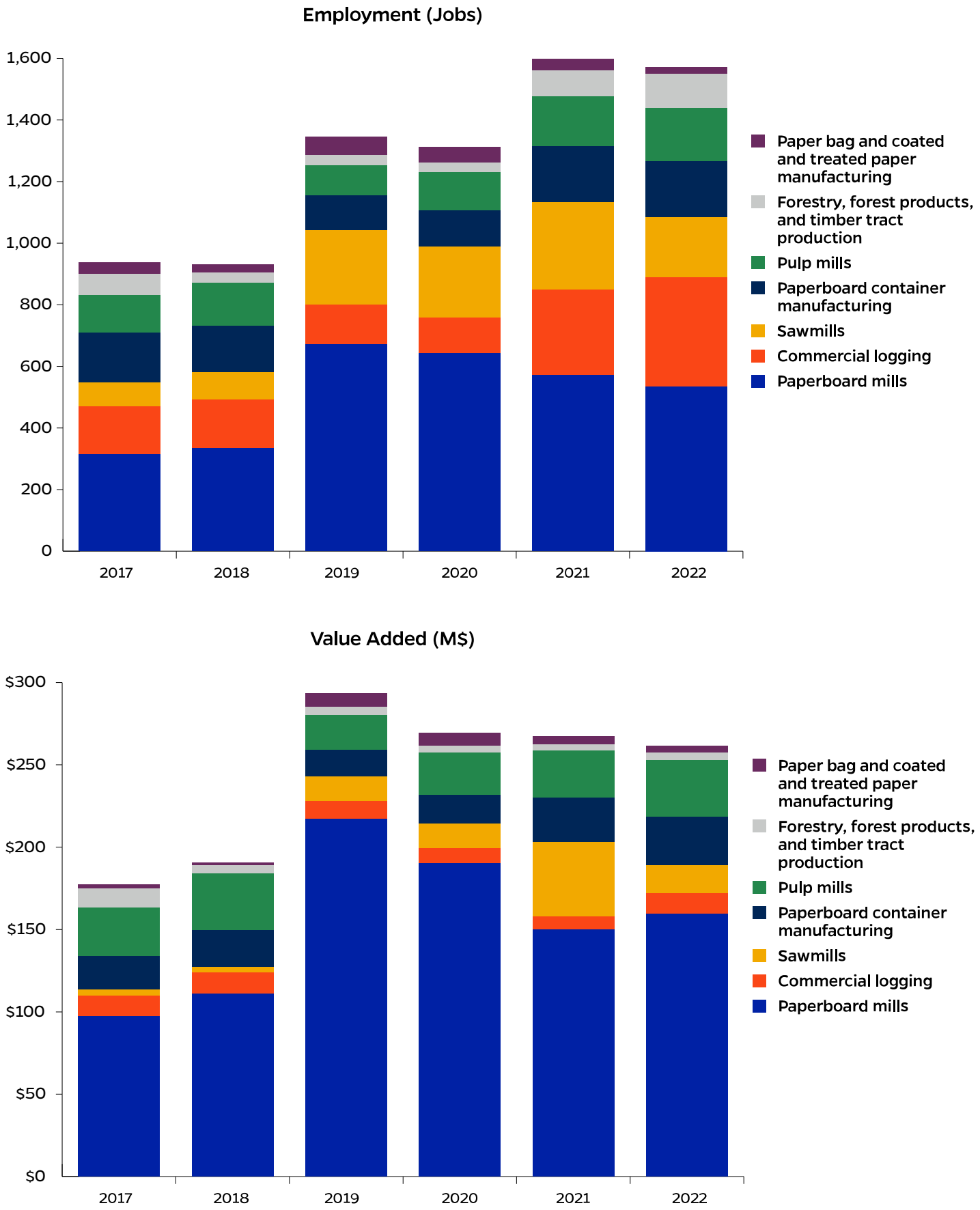


Figure 4. *Trend in employment and value added for forest industry sectors in Nassau County, Florida, 2017–22. Source: IMPLAN county data (IMPLAN Group LLC).*

Photo credit: RYAM.

DATA AND METHODS

Company Data

Information on production volume, number of employees, and value of capital improvements was provided by the companies for this analysis as shown in Tables 1–3. Data were for calendar year 2023, except for RYAM, which were for 12 months from mid-2023 to mid-2024. Data were reported separately for the Smurfit Westrock paperboard mill, box plant, and woodlands divisions, with jobs for the woodlands division incorporated into the paperboard mill numbers. Total production volume included 129,645 tons of refined cellulose (RYAM), 789,523 tons of paperboard and 1.3 billion square feet of paperboard packaging (Smurfit Westrock), and 82,000 tons of lignin products (LignoTech). The mills consumed 3.4 million tons of roundwood logs and wood chips sourced.

The three companies had a combined total of 1,445 full-time equivalent employees, including full-time, part-time, and contract workers. Capital improvements to facilities during 2021–23 were valued at $136.30 million, including $127.3 million for plant equipment and $9.01 million for buildings. Capital spending over the three-year period was divided by three to represent an annual average comparable with annual operations. Company operating revenues were provided confidentially to the investigators for analysis, but are not disclosed in this report. RYAM and Smurfit Westrock provided lists of counties that supplied wood to the mills, which together constituted the 41-county wood resource region in northeast Florida and southeast Georgia shown in Figure 5.

Table 1. *Raw material consumed and annual product volumes of each Fernandina Beach forest manufacturing entity.*

Metric	RYAM Pulp Mill	Smurfit Westrock Paperboard Mill	Smurfit Westrock Box Plant	Smurfit Westrock Woodlands	LignoTech	Total
Raw material consumed (tons)	901,481	2,426,209	75,400	N/A	N/A	**3,403,090**
Annual product volume	129,645 tons cellulose fiber	789,523 tons linerboard	1.3 billion sq.ft. paperboard packaging	N/A	82,000 tons lignin	N/A

Note: Data are for calendar year 2023, except RYAM is for fiscal year 2023-24.

Table 2. *Employment for each Fernandina Beach forest manufacturing entity.*

Employees (annual average)	RYAM Pulp Mill	Smurfit Westrock Paperboard Mill	Smurfit Westrock Box Plant	Smurfit Westrock Woodlands	LignoTech	Total
Full-time	325	459	116	11	58	**969**
Part-time	N/A	12	N/A	N/A	1	**13**
Contract workers	N/A	456	N/A	6	2	**464**
Total FTEs	**325**	**927**	**116**	**17**	**60**	**1,445**

Note: Data are for calendar year 2023, except RYAM is for fiscal year 2023-24.

Table 3. *Capital expenditures for buildings and equipment by each Fernandina Beach forest manufacturing entity.*

Type of Capital Expenditure	RYAM Pulp Mill	Smurfit Westrock Paperboard Mill	Smurfit Westrock Box Plant	Smurfit Westrock Woodlands	LignoTech	Total
Equipment	$40,301,781	$65,846,951	$17,455,229	$748,969	$2,932,000	**$127,284,930**
Buildings	$5,036,747	$3,465,629	$78,000	$398,753	$31,000	**$9,010,129**
Total	**$45,338,528**	**$69,312,580**	**$17,533,229**	**$1,147,722**	**$2,963,000**	**$136,295,059**
Share to local contractors (%)	80%	100%	100%	22%	85%	N/A

Note: Company gross revenues are not disclosed. Data are the three-year average for the period 2021-23.

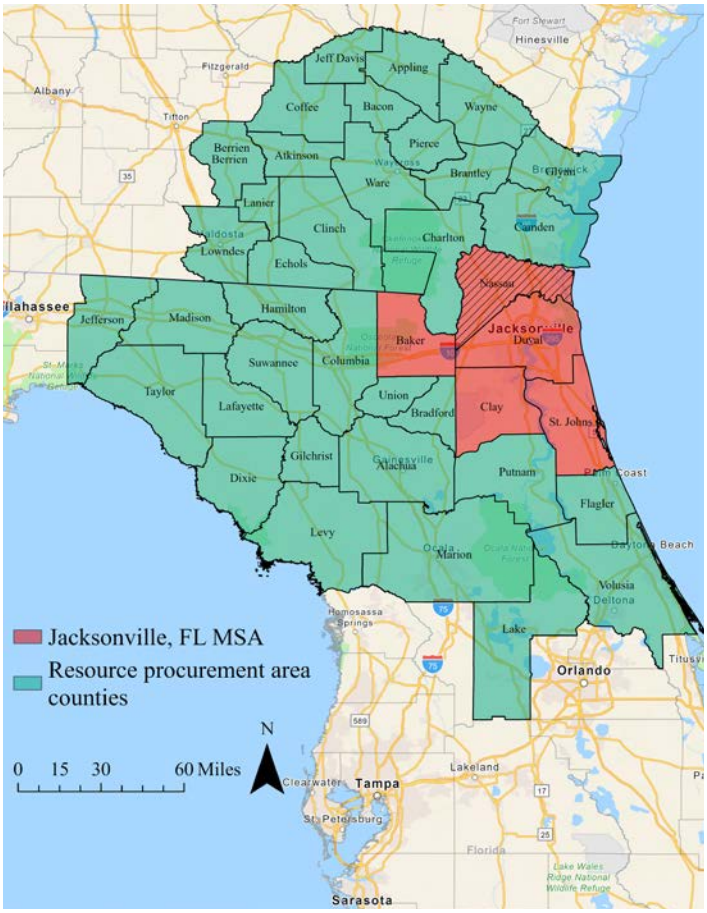


Figure 5. *Map of the Jacksonville FL MSA, and Florida and Georgia counties in the wood resource procurement region for forest product manufacturing companies in Fernandina Beach, Florida.*

Regional Economic Modeling and Analysis Methods

Regional economic models for this analysis were developed using the IMPLAN software and 2022 state and county database licensed for the online modeling app from IMPLAN Group LLC. This system enables construction of input-output and social accounting matrix (IO-SAM) models that represent the structure of a regional economy in terms of transactions among industry sectors, and social-institutional accounts for households, local, state, and federal governments, corporations, and capital investment. The IMPLAN trade flows methodology estimates the share of commodities purchased from local sources. IMPLAN offers a high level of industry detail, with 544 industry sectors, and includes accounts for industrial and commodity production, employment, labor and property income, household and institutional consumption, domestic and international trade (imports, exports), government taxes, transfer payments (such as welfare and retirement), and capital investment.

Economic multipliers are calculated for each industry to estimate the secondary or "ripple" effects of that occur as money cycles through the local economy (Miller and Blair, 2009). Indirect effects represent the economic activity within specific supply chains associated with the purchase of intermediate inputs from vendor firms. Induced effects represent the economic activity associated with spending by households of industry employees and by federal, state, and local government entities. The total economic impacts represent the sum of direct, indirect, and induced effects. Results are referred to as "economic contributions," rather than "economic impacts" because they represent measures of ongoing economic activity of existing industries as opposed to a net change in activity resulting from external influences (Watson et al., 2007), with inputs to the models adjusted to net out intra-industry purchases, as described by Cheney (2016).

The economic contribution analysis was conducted with regional models for Nassau County, Florida, and for the 41-county wood resource region in northeast Florida and southeast Georgia that provides the raw wood supply to mills in Fernandina Beach (Figure 5).

Information on operating revenues, direct employment, and capital expenditures were entered into the IMPLAN models in specific industry sectors for analysis. Operating revenues and employment for RYAM were assigned to industry sector 144-Pulp mills, while those for Smurfit Westrock were assigned to sectors 146-Paperboard mills and 147-Paperboard container manufacturing, and values for lignin products manufacturing (LignoTech) were assigned to 163-Other basic organic chemical manufacturing. Capital improvement expenditures for plant equipment were assigned to industry sector 267-Sawmill, woodworking and paper machinery, and capital expenditures for buildings were assigned to sector 51-Construction of new manufacturing structures. Note that sector 267- Sawmill, woodworking and paper machinery did not exist in Nassau County, so contributions for capital equipment were not estimated for that model area. Capital expenditures were adjusted to reflect the share of purchases from local contractors reported by the companies (Table 3). For capital improvements, IMPLAN imputed direct employment, employee compensation, and proprietor income for each sector based on regional averages. The software automatically applied output deflators to the input information to express in model year (2022) values, then reinflated the resulting impact estimates using GDP deflators to express in 2023 dollars to be consistent with the original data.

Measures of economic contributions reported include industry output or revenue (sales), employment (full-time and part-time job-years), value added (GDP), labor income (employee wages, salaries, benefits, proprietor income), and other property income (rents, royalties, interest, corporate dividends), taxes on production and imports (less subsidies), and all local, state, and federal taxes. A glossary of economic terms is provided in the Appendix.

ECONOMIC CONTRIBUTION RESULTS

Summary for the Florida-Georgia Wood Resource Region

Economic contributions of manufacturing operations and capital improvements of three forest industry companies in Fernandina Beach, Florida within the wood resource region of northeast Florida and southeast Georgia are summarized in Table 4, contributions in Nassau County are summarized in Table 5, and results are illustrated in Figures 6 and 7, respectively.

Total economic contributions within the region were estimated at 4,977 full-time and part-time jobs, $1.711 billion in industry output or revenues, and $703 million in value added or Gross Domestic Product (GDP), including regional multiplier effects (Table 4). Labor income contributions of $400 million were comprised of employee compensation ($361 million for wages, salaries, benefits) and proprietor or business owner income ($39.2 million). Other property income contributions for interest, royalties, dividends, etc. were $258 million. Government tax contributions of $156 million included local county and subcounty taxes ($19.6 million), state taxes ($27.0 million), and federal taxes ($109 million).

Table 4. *Summary of economic contributions of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region.*

Activity (company), Multiplier Effect	Employment (Jobs)	Output (M$)	Value Added (M$)	Employee Compensation (M$)	Proprietor Income (M$)	Other Property Income (M$)	Local, State, Federal Taxes (M$)
Pulp mill (RYAM)	1,080	$370.59	$144.57	$77.20	$5.70	$52.51	$32.25
Paperboard mill (Smurfit Westrock)	3,054	$1,056.42	$459.30	$229.62	$27.87	$173.37	$100.22
Box plant (Smurfit Westrock)	354	$138.11	$46.58	$22.63	$3.33	$16.95	$10.87
Lignin manufacturing (LignoTech)	162	$72.93	$21.27	$10.52	$0.89	$8.15	$4.89
Capital improvements-buildings (all companies)	29	$4.63	$2.34	$1.39	$0.24	$0.58	$0.56
Capital improvements-equipment (all companies)	297	$68.60	$28.74	$19.24	$1.15	$6.58	$7.17
Total	**4,977**	**$1,711.28**	**$702.79**	**$360.60**	**$39.17**	**$258.14**	**$155.97**
Direct effects	1,591	$988.35	$331.61	$181.73	$17.24	$124.14	$63.76
Indirect effects	1,917	$459.52	$219.62	$109.99	$15.61	$73.24	$55.16
Induced effects	1,469	$263.41	$151.55	$68.89	$6.32	$60.76	$37.06

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs.
Source: IMPLAN model for 41-county area in Florida and Georgia, 2022 (IMPLAN Group LLC).

Table 5. *Summary of economic contributions of forest product manufacturing in Fernandina Beach within Nassau County, Florida.*

Activity (company), Multiplier Effect	Employment (Jobs)	Output (M$)	Value Added (M$)	Employee Compensation (M$)	Proprietor Income (M$)	Other Property Income (M$)	Local, State, Federal Taxes (M$)
Pulp mill (RYAM)	659	$268.96	$91.34	$47.65	$8.50	$30.73	$19.19
Paperboard mill (Smurfit Westrock)	1,881	$781.54	$314.58	$152.31	$30.01	$117.56	$62.84
Box plant (Smurfit Westrock)	216	$105.16	$30.76	$14.02	$4.12	$10.64	$6.71
Lignin manufacturing (LignoTech)	101	$59.22	$3.86	$1.62	$0.61	$1.25	$0.94
Capital improvements-buildings (all companies)	25	$3.39	$1.61	$0.94	$0.31	$0.31	$0.37
Total	**2,883**	**$1,218.27**	**$442.15**	**$216.53**	**$43.54**	**$160.49**	**$90.05**
Direct	1,465	$951.36	$304.14	$160.31	$25.06	$110.80	$57.00
Indirect	924	$184.63	$88.90	$39.77	$15.43	$25.99	$21.71
Induced	494	$82.27	$49.12	$16.45	$3.05	$23.70	$11.35

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs.
Source: IMPLAN model for Nassau County, Florida, 2022 (IMPLAN Group LLC).

For individual activities/companies, employment and value added contributions within the region were 1,080 jobs and $145 million for the pulp mill (RYAM), 3,054 jobs and $459 million for the paperboard mill (Smurfit Westrock), 354 jobs and $46.6 million for the paperboard container plant (Smurfit Westrock), 162 jobs and $21.3 million for lignin manufacturing (LignoTech), and 327 jobs and $31.1 million for capital improvements to buildings and equipment.

Economic contributions within the region detailed by regional multiplier effect indicated employment direct effects of 1,591 jobs, indirect effects of 1,917 jobs, and induced effects of 1,469 jobs, while value added direct effects were $332 million, indirect effects were $220 million, and induced effects were $152 million.

Employment, output, value added, and tax contributions results for the region are charted in Figure 6.

Photo credit: RYAM.

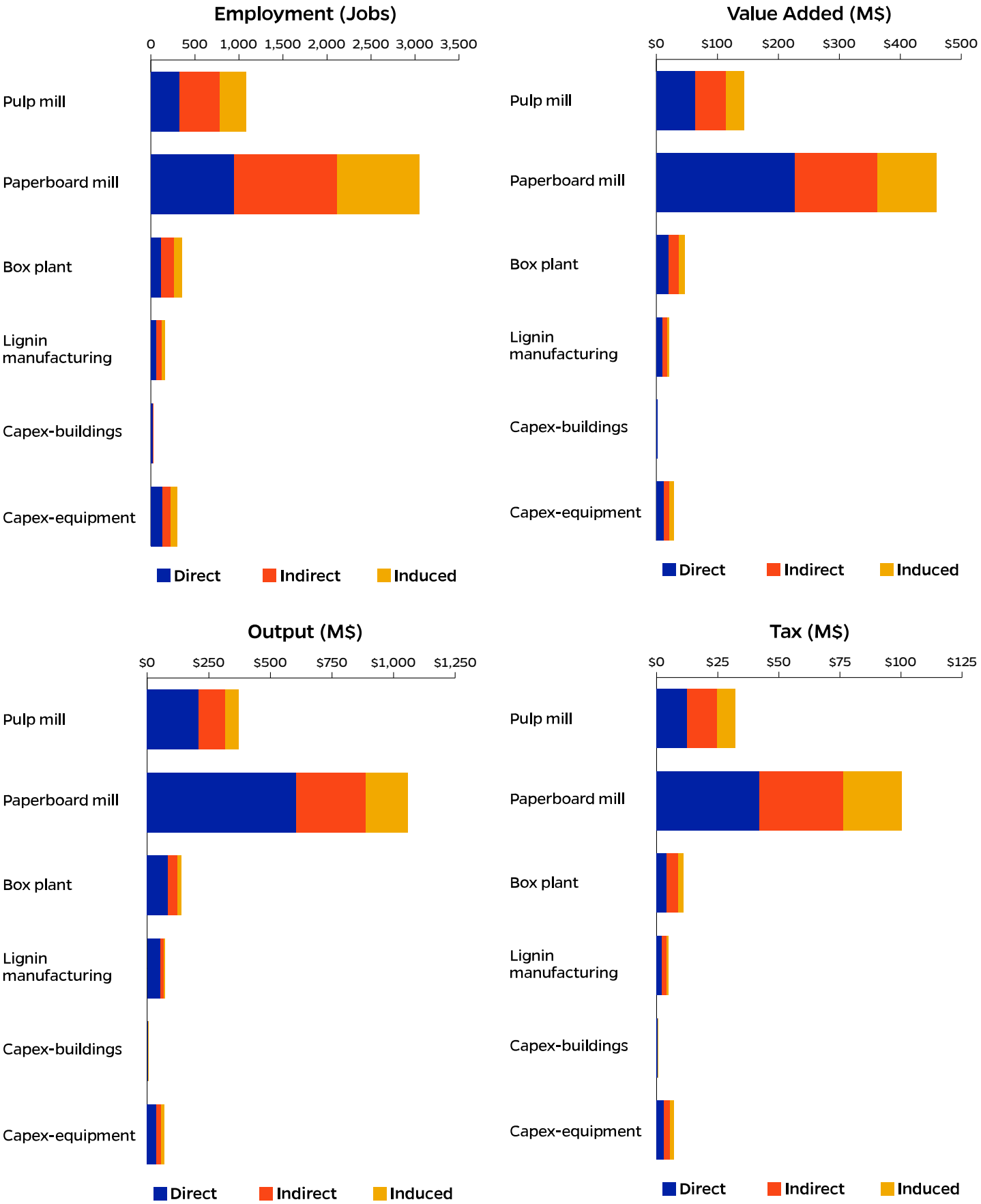


Figure 6. *Employment, output, value added, and tax contributions of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region.*

Photo credit: RYAM.

Summary for Nassau County

Total economic contributions within Nassau County were estimated at 2,883 jobs, $1.218 billion in industry output, and $442 million in value added (Table 5). Labor income contributions of $260 million included employee compensation ($217 million) and proprietor income ($43.5 million). Other property income contributions were $160 million. Government tax contributions of $90.1 million included local county and subcounty taxes ($11.0 million), state taxes ($11.0 million), and federal taxes ($68.1 million).

Employment and value added contributions within Nassau County were 659 jobs and $91.3 million for the pulp mill (RYAM), 1,881 jobs and $315 million for the paperboard mill (Smurfit Westrock), 216 jobs and $30.8 million for the paperboard container plant (Smurfit Westrock), 101 jobs and $3.86 million for lignin manufacturing (LignoTech), and 25 jobs and $1.61 million for capital improvements to buildings (equipment improvements not estimated).

Economic contributions within Nassau County detailed by regional multiplier effect showed employment direct effects of 1,465 jobs, indirect effects of 924 jobs, and induced effects of 494 jobs, while value added direct effects were $304 million, indirect effects were $88.9 million, and induced effects were $49.1 million.

Economic contributions of forest product manufacturing by the three firms in Nassau County represented 6.6 percent of total county employment and 9.6 percent of county GDP in 2022.

Employment, output, value added and tax contributions results for Nassau County are charted in Figure 7.

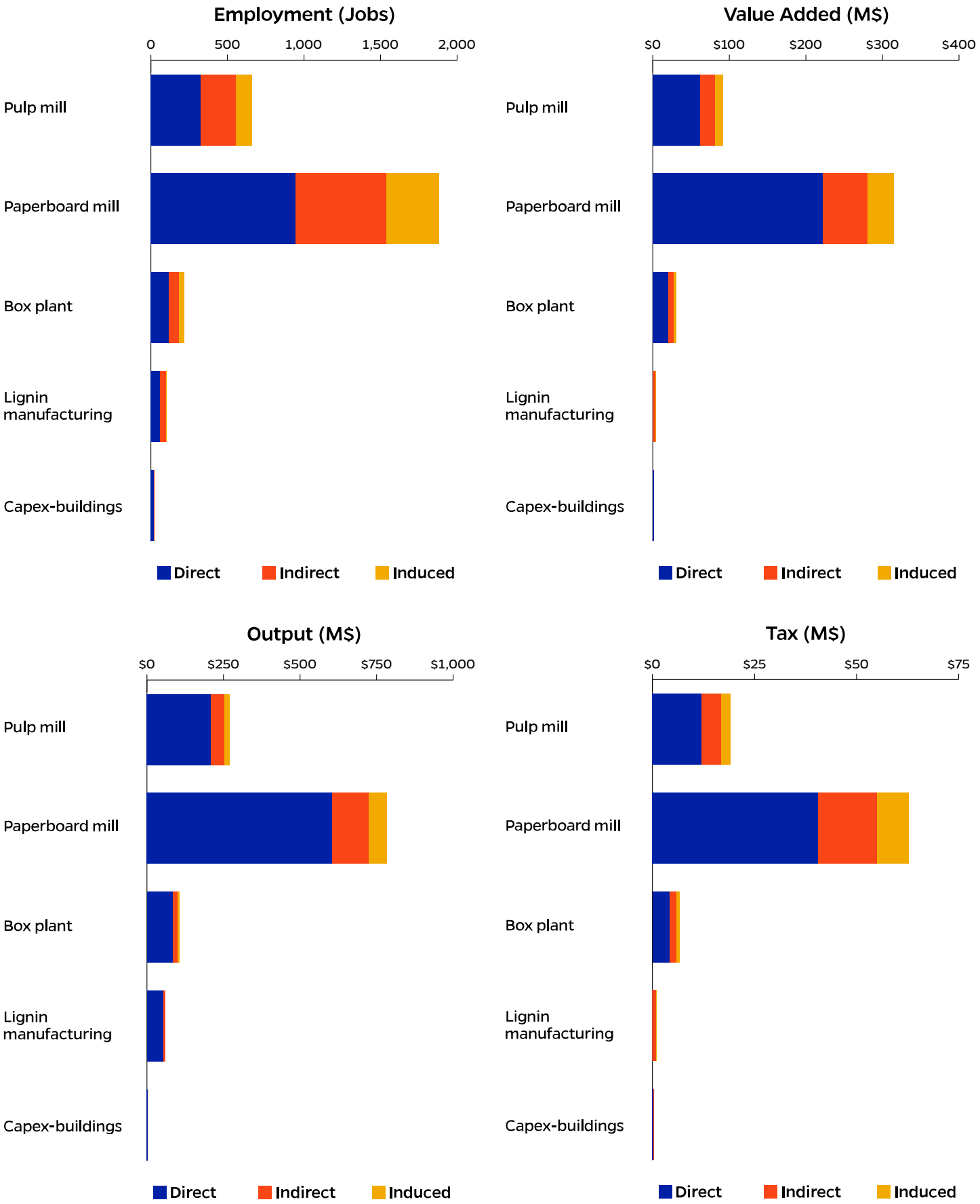


Figure 7. *Employment, output, value added, and tax contributions of forest product manufacturing in Fernandina Beach within Nassau County, Florida.*

Economic Contributions by Industry Group

Economic contributions within the Florida-Georgia wood resource region are detailed by industry groups classified according to the North American Industry Classification System (NAICS) at the two-digit level, as shown in Table 6 and charted for employment and value added in Figure 8. Manufacturing was the largest contributing sector, with 1,726 jobs, $1.072 billion in industry output, and $356 million in value added. Other sectors with large employment contributions were Transportation & Warehousing (371 jobs), Administrative, Support, & Waste Services (370 jobs), Wholesale Trade (301 jobs), and Health Care & Social Assistance (296 jobs). Other sectors with significant value added contributions were Wholesale Trade ($54.6 Million), Real Estate & Rental ($51.2 million), Transportation & Warehousing ($33.9 million), and Utilities ($25.0 million). Employment of 304 jobs and value added of $19.7 million was supported in the Ag, Forestry, Fishing, & Hunting sector through the wood procurement supply chain.

Economic contributions within Nassau County by NAICS industry group are shown in Table 7 and Figure 9. The Manufacturing sector contributed 1,495 jobs, $974 million in output, and $308 million in value added. Other sectors with significant employment contributions were Ag, Forestry, Fishing, & Hunting (275 jobs), Administrative, Support, & Waste Services (196 jobs), Retail Trade (117 jobs), and Accommodation & Food Services (117 jobs). Other sectors with large value added contributions were Real Estate & Rental ($23.1 million), Wholesale Trade ($21.5 million), Utilities ($14.4 million), and Ag, Forestry, Fishing, & Hunting ($10.2 million).

Table 6. *Economic contributions by major industry group of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region.*

NAICS 2-digit industry	Employment (Jobs)	Output (M$)	Value Added (M$)
11 Ag, Forestry, Fishing, & Hunting	304	$29.93	$19.72
21 Mining	5	$2.90	$0.54
22 Utilities	30	$46.67	$25.04
23 Construction	51	$10.46	$4.53
31-33 Manufacturing	1,726	$1,072.25	$355.75
42 Wholesale Trade	301	$108.45	$54.64
44-45 Retail Trade	260	$32.60	$20.15
48-49 Transportation & Warehousing	371	$68.00	$33.86
51 Information	37	$23.16	$8.76
52 Finance & Insurance	184	$48.17	$19.37
53 Real Estate & Rental	151	$74.04	$51.20
54 Professional, Sci, & Tech Services	230	$38.75	$21.79
55 Management of Companies	68	$15.11	$8.72
56 Administrative, Support, & Waste Services	370	$39.05	$18.55
61 Educational Services	34	$2.35	$1.47
62 Health Care & Social Assistance	296	$38.74	$23.75
71 Arts, Entertainment, & Recreation	51	$4.03	$2.40
72 Accommodation & Food Services	239	$22.08	$10.92
81 Other Services (Except Public Admin)	235	$21.50	$14.17
9A Government Enterprises	35	$13.05	$7.47
Total	**4,977**	**$1,711.28**	**$702.79**

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs. Estimates include regional multiplier effects.
Source: IMPLAN model for 41-county area in Florida and Georgia, 2022 (IMPLAN Group LLC).

Figure 8. *Employment and value added contributions by industry group of forest product manufacturing in Fernandina Beach within the Florida-Georgia wood resource region.*

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs. Estimates include regional multiplier effects.

Source: IMPLAN model for 41-county area in Florida and Georgia, 2022 (IMPLAN Group LLC).

Table 7. *Economic contributions by major industry group of forest product manufacturing in Fernandina Beach within Nassau County, Florida.*

NAICS 2-digit industry	Employment (Jobs)	Output (M$)	Value Added (M$)
11 Ag, Forestry, Fishing, & Hunting	275	$19.07	$10.17
21 Mining	1	$0.92	$0.15
22 Utilities	16	$28.07	$14.43
23 Construction	40	$7.13	$2.86
31-33 Manufacturing	1,495	$974.01	$308.47
42 Wholesale Trade	71	$34.66	$21.48
44-45 Retail Trade	117	$13.55	$8.00
48-49 Transportation & Warehousing	69	$9.67	$4.69
51 Information	7	$3.00	$0.82
52 Finance & Insurance	54	$9.86	$2.70
53 Real Estate & Rental	66	$34.61	$23.13
54 Professional, Sci, & Tech Services	88	$13.86	$6.95
55 Management of Companies	34	$11.21	$8.03
56 Administrative, Support, & Waste Services	196	$22.20	$9.53
61 Educational Services	8	$0.51	$0.30
62 Health Care & Social Assistance	70	$7.25	$4.80
71 Arts, Entertainment, & Recreation	23	$1.90	$0.99
72 Accommodation & Food Services	117	$11.14	$5.52
81 Other Services (Except Public Admin)	123	$11.05	$7.04
9A Government Enterprises	14	$4.58	$2.11
Total	**2,883**	**$1,218.27**	**$442.15**

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs. Estimates include regional multiplier effects.
Source: IMPLAN model for Nassau County, Florida, 2022 (IMPLAN Group LLC).

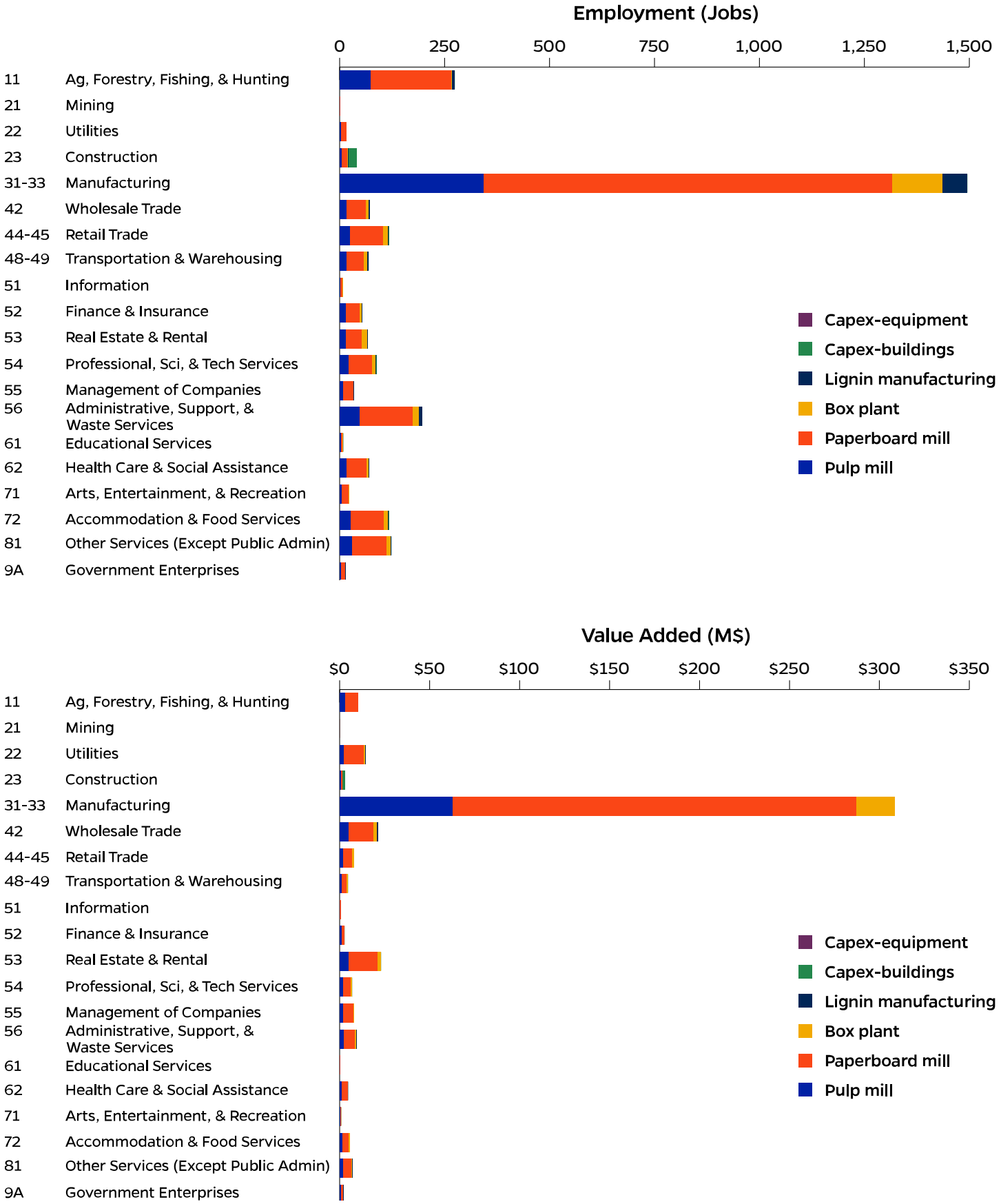


Figure 9. *Employment and value added contributions by industry group of forest product manufacturing in Fernandina Beach within Nassau County, Florida.*

Values in millions of 2023 dollars. Employment represents full-time and part-time jobs. Estimates include regional multiplier effects.
Source: IMPLAN model for Nassau County, Florida, 2022 (IMPLAN Group LLC).

Photo credit: RYAM.

Government Tax Impacts

Local, state, and federal government tax contributions of Fernandina Beach forest manufacturing firms are summarized for the Florida-Georgia wood resource region in Table 8 and for Nassau County in Table 9. Within the region, total tax contributions at all levels of government were $156 million, including $19.6 million to county and subcounty governments, $27.0 million to state government, and $109 million to the federal government. County taxes included $6.29 million in general taxes such as property tax and sales tax, $6.07 million for subcounty general (municipal) taxes, and $7.22 million for subcounty special districts, such as libraries, schools, police, and fire services. Sales and property taxes were the largest items for state government taxes; personal income and payroll taxes (employee and employer portions) were the largest federal tax items.

Within Nassau County, total tax contributions were $90.1 million, including $11.0 million to county government and subcounty districts, $11.0 million to state government, and $68.1 million to the federal government. County taxes included $6.04 million in general taxes such as property tax and sales tax, $1.14 million for subcounty general taxes, and $3.82 million for subcounty special districts.

Table 8. *Local, state, and federal tax impacts of forest product manufacturing in Fernandina Beach, within the Florida-Georgia wood resource region.*

Industry	County Taxes (M$)	Subcounty General Taxes (M$)	Subcounty Special District Taxes (M$)	Total County, Subcounty Taxes (M$)	State Taxes (M$)	Federal Taxes (M$)	Total Local, State, Federal Taxes (M$)
Pulp mill (RYAM)	$1.29	$1.24	$1.47	$4.00	$5.52	$22.72	**$32.25**
Paperboard mill (Smurfit Westrock)	$3.99	$3.85	$4.57	$12.41	$17.23	$70.58	**$100.22**
Box plant (Smurfit Westrock)	$0.51	$0.50	$0.59	$1.60	$2.15	$7.12	**$10.87**
Lignin manufacturing (LignoTech)	$0.24	$0.23	$0.27	$0.75	$1.00	$3.15	**$4.89**
Capex-buildings (all companies)	$0.02	$0.02	$0.02	$0.06	$0.08	$0.42	**$0.56**
Capex-equipment (all companies)	$0.25	$0.24	$0.29	$0.77	$1.05	$5.35	**$7.17**
Total	**$6.29**	**$6.07**	**$7.22**	**$19.58**	**$27.03**	**$109.35**	**$155.97**

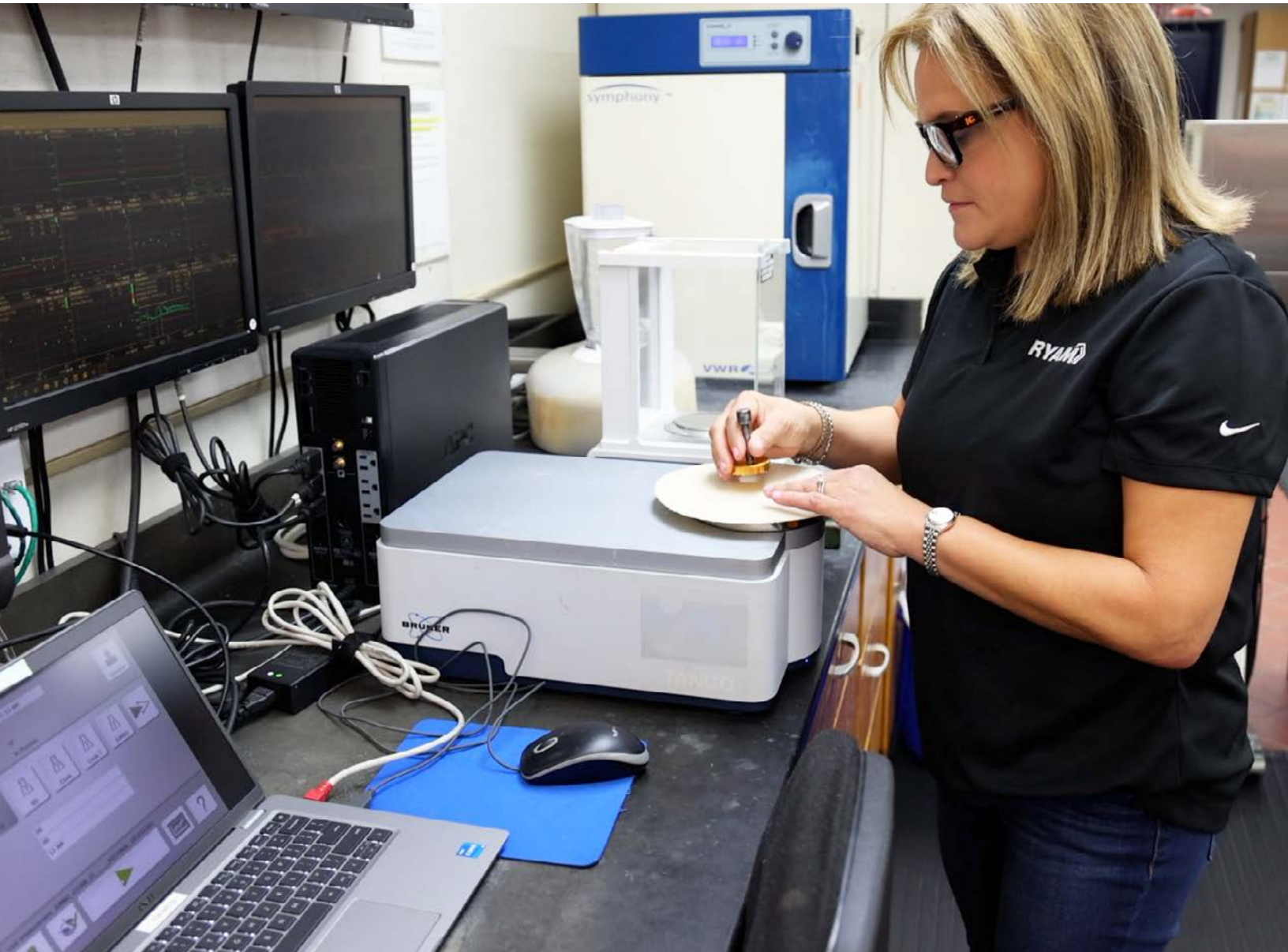
Values in millions of 2023 dollars. Estimates include regional multiplier effects.
Source: IMPLAN model for 41-county area in Florida and Georgia, 2022 (IMPLAN Group LLC).

Table 9. *Local, state and federal tax impacts of forest product manufacturing in Fernandina Beach within Nassau County, Florida.*

Industry	County Taxes (M$)	Subcounty General Taxes (M$)	Subcounty Special District Taxes (M$)	Total County, Subcounty Taxes (M$)	State Taxes (M$)	Federal Taxes (M$)	Total Local, State, Federal Taxes (M$)
Pulp mill (RYAM)	$1.25	$0.24	$0.79	$2.28	$2.26	$14.65	**$19.19**
Paperboard mill (Smurfit Westrock)	$4.11	$0.78	$2.60	$7.49	$7.50	$47.84	**$62.84**
Box plant (Smurfit Westrock)	$0.55	$0.10	$0.35	$1.01	$0.98	$4.71	**$6.71**
Lignin manufacturing (LignoTech)	$0.10	$0.02	$0.07	$0.19	$0.18	$0.57	**$0.94**
Capex-buildings (all companies)	$0.02	$0.00	$0.01	$0.03	$0.03	$0.31	**$0.37**
Total	**$6.04**	**$1.14**	**$3.82**	**$11.00**	**$10.96**	**$68.09**	**$90.05**

Values in millions of 2023 dollars. Estimates include regional multiplier effects.
Source: IMPLAN model for Nassau County, Florida, 2022 (IMPLAN Group LLC).

Photo credit: RYAM.



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APPENDIX: GLOSSARY OF ECONOMIC IMPACT TERMS

Contribution (economic) represents the gross level of economic activity associated with an industry, event, or policy in an existing regional economy.

Employee Compensation is comprised of wages, salaries, commissions, and benefits such as health and life insurance, retirement, and other forms of cash or non-cash compensation.

Employment is a measure of the number of jobs involved, including full-time, part-time, and seasonal positions. It is not a measure of full-time equivalents (FTE).

Exports are sales of goods to customers outside the region in which they are produced, which represents a net inflow of money to the region. This also applies to sales of goods and services to customers visiting from other regions.

Final Demand represents sales to final consumers, including households, governments, and exports from the region.

Gross Regional Product is a measure of total economic activity in a region, or total income generated by all goods and services. It equals the total value added by all industries in that region and is equivalent to Gross Domestic Product for the nation.

IMPLAN is a computer-based input-output modeling system that enables users to create regional economic models and multipliers for any region consisting of one or more counties or states in the U.S. The current version of the IMPLAN, accounts for commodity production and consumption for 546 industry sectors, 10 household income levels, taxes to local/state and federal governments, capital investment, imports and exports, transfer payments, and business inventories. Regional datasets for individual counties or states are purchased separately. The IMPLAN software and regional data are licensed by IMPLAN Group, LLC, Huntersville, NC.

Photo credit: RYAM.

Imports are purchases of goods and services originating outside the region of analysis.

Income is the money earned within the region from production and sales.

Total Income includes labor incomes such as wages, salaries, employee benefits, and business proprietor income, plus other property income.

Taxes on Production and Imports are taxes paid to governments by individuals or businesses for property, excise, and sales taxes, but do not include income taxes.

Input-Output (I-O) Model and Social Accounting Matrix (SAM) is a representation of the transactions between industry sectors within a regional economy that captures what each sector purchases from every other sector to produce its output of goods or services. Using such a model, flows of economic activity associated with any change in spending or employment can be traced backwards through the supply chain.

Local refers to goods and services that are sourced from within the region, which can be defined as a county, multi-county cluster, or state.

Non-local refers to economic activity originating outside the region.

Margins represent the portion of the purchaser price accruing to the retailer, wholesaler, and producer/manufacturer in the supply chain. Typically, only the retail margins of many goods purchased by consumers accrue to the local region, as the wholesaler, shipper, and manufacturer often lie outside the local area.

Multipliers capture the total effects, both direct and secondary, in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers are derived from an I-O model of the regional economy. Multipliers express the degree of interdependency between sectors in a region's economy and therefore vary considerably across regions and sectors. Indirect effects represent the changes in sales, income, or employment within the region in backward-linked industries supplying goods and services to businesses (e.g., increased sales in input supply firms resulting from more industry sales). Induced effects represent the increased sales within the region from household spending of the income earned in the direct and supporting industries for housing, utilities, food, etc.

Other Property Income represents income received from investments such as corporate dividends, royalties, property rentals, or interest on loans.

Output is the dollar value of a good or service produced or sold and is equivalent to sales revenues plus changes in business inventories.

Producer Prices are the prices paid for goods at the factory or point of production. For manufactured goods, the purchaser price equals the producer price plus a retail margin, a wholesale margin, and a transportation margin. For services, the producer and purchaser prices are equivalent.

Proprietor Income is income received by non-incorporated private business owners or self-employed individuals.

Purchaser Prices are the prices paid by the final consumer of a good or service.

Region or Regional Economy is the geographic area and the economic activity it contains for which contributions are estimated. It can consist of an individual county, an aggregation of several counties, a state, or aggregation of states. These aggregations are sometimes defined on the basis of worker commuting patterns.

Sector is an individual industry or group of industries that produce similar products or services or have similar production processes. Sectors are classified according to the North American Industrial Classification System (NAICS).

Value Added is a broad measure of income, representing the sum of employee compensation, proprietor income, other property income, and indirect business taxes. Value added is a commonly used measure of the contribution of an industry to a regional economy because it avoids double counting of intermediate sales.

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On the cover: Aerial view of the RYAM manufacturing facility in Fernandina Beach, Florida.

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