

# Rural Manufacturers in the Export Market

*A new nationwide survey of manufacturing establishments provides information about patterns of exporting by rural and urban businesses. About half of nonmetro establishments reported exports in 1995 that amounted to 10 percent of nonmetro manufacturing shipments. Large plants account for most exports. Nonmetro exports of metal products, machinery, and electrical and transportation equipment are about equal to exports by natural resource-based industries. Nonmetro plants are slightly less likely to export than metro plants, but the difference disappears when other characteristics are taken into account.*

Exports are viewed as a measure of business success and economic vitality. Overseas sales expand the market for domestically produced goods and services, bringing additional jobs and income to the domestic economy. Much Federal and State economic policy concerns itself with encouraging exports. Although many studies have estimated the national and regional effects of exports, there has been little information about the extent to which exports benefit rural areas. We also know relatively little about which types of businesses participate in export markets. This article uses a recent nationwide survey of manufacturing plants to investigate the extent of exports among rural and urban establishments (see “The Data”). The relative isolation of rural locations and distance to ports are barriers that could make it more difficult for rural businesses to participate in world markets. The rural economy’s mix of labor-intensive industries is vulnerable to imports from low-wage competitors, but we know little about how much rural manufacturers benefit from exports. Given today’s increasingly globalized economy, the extent of participation in export markets by rural businesses is an important indicator of future prospects for the rural economy.

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## Half of Nonmetro Plants Export

About half of nonmetro manufacturing plants sold at least part of their shipments to customers outside the United States in 1995 (table 1). A slightly higher share (57 percent) of metro plants had exports, revealing a modest “export gap” between metro and nonmetro plants. For most plants, their exports are a small share of their shipments. Only 8 percent of nonmetro plants exported 25 percent or more of their shipments, and 18 percent exported 10-24 percent. About half of nonmetro plants with exports sold less than 10 percent of their shipments overseas. The average percentage of shipments exported by a nonmetro

Table 1

### Exports by nonmetro and metro manufacturing plants, 1995

*Half of nonmetro manufacturing plants are active in the export market*

Item	Nonmetro	Metro
	Percent	
Plants with exports, 1995	49.8	56.9
Average share of shipments exported		
Establishment-weighted	6.6	8.7
Shipments-weighted	10.3	11.3
	Billion dollars	
Estimated dollar value of exports	63.8	299.2

Source: Estimated from ERS Rural Manufacturing Survey data.

## The Data

The ERS Rural Manufacturing Survey (RMS) is a nationwide study of factors affecting competitiveness of rural and urban businesses. The RMS includes extensive information provided by 2,844 nonmetro and 1,065 metro establishments in all manufacturing industries. The data were collected by a combination of telephone interviews and mail questionnaires in 1996.

Among other questions, the RMS asked respondents, "About what percentage of the total value of your 1995 final shipments went to customers in the following three places: local destinations within a one hour drive; destinations elsewhere within the United States; or destinations outside the United States?" This analysis of exports is based on the percentage of shipments to destinations outside the United States. The value of exports was estimated by multiplying the reported export percentage by the value of 1995 product shipments reported by the respondent. Sample weights were used to obtain estimates of industry totals from sample data.

Comparing this study's estimates of exports and shipments with Census Bureau totals suggests that this study's estimates are lower than the true values. Total 1995 U.S. manufactured exports estimated from the RMS sample are \$364 billion. A similar estimate of manufactured exports for 1993 (the most recent available) from the Census Bureau is \$401 billion. This value is \$37 billion higher, but it is within a 95-percent confidence interval for the RMS estimate. Ratios of exports to shipments are similar to Census values.

manufacturing plant was 6.6 percent. Metro plants averaged a slightly higher 8.7 percent. Exporters tend to be larger than nonexporters, so this average understates the share of total manufacturing output exported. When the average is computed weighting each plant by its value of shipments, we find that approximately 10.3 percent of nonmetro manufacturing shipments were exported, compared with 11.3 percent of metro shipments.

Total nonmetro-manufactured exports are estimated at nearly \$64 billion. This estimate is subject to sampling error, but we can say that the true value lies between \$54 billion and \$73 billion with 95-percent confidence. This likely understates the value of exports, since some products may be purchased by a domestic business and then sold overseas. Other products may serve as intermediate goods to manufacture final products that are then exported. On the other hand, the value of exports by rural manufacturers overstates the impact of exports on the rural economy when exported goods are made with components or materials that are imported or purchased from urban suppliers. Nevertheless, exports certainly play an important role in the nonmetro manufacturing sector.

Manufacturing plants report growing participation in export markets. Forty-three percent of nonmetro establishments had export sales in 1992, 7 percentage points lower than the 50 percent who reported having exports in 1995. A similar increase was reported by metro plants. Bernard and Jensen (1995) found that plants frequently move in and out of the export market. The data in this study show more plants started than stopped exporting between 1992 and 1995. Fourteen percent of nonmetro plants reporting no exports for 1992 were exporters in 1995. Only 3 percent of 1992 exporters did not export in 1995.

### Nonmetro Plants Produce 18 Percent of the Dollar Value of Exports

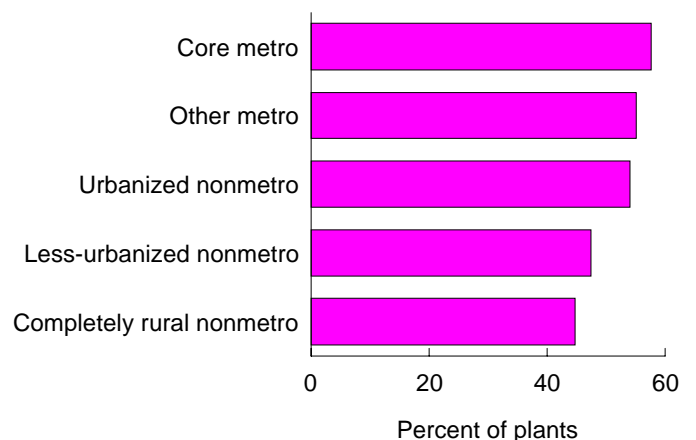
Breaking down exports by the level of urbanization shows that, even in the most rural areas, a large portion of manufacturing plants have export sales. An average of 45 percent of plants in "completely rural" counties have export sales (fig. 1). The percentage with exports climbs to 58 percent in "core metro" counties—the largest urban areas. About 55 percent of plants have exports in "urbanized" nonmetro counties and in "other metro" counties—those in metro areas with a population under 1 million (see "Rural-Urban Codes").

About 18 percent of the dollar value of exports comes from nonmetro areas. That includes 6 percent from urbanized

Figure 1

#### Share of plants with exports by urbanization

*Plants in more urbanized counties are more likely to export*



Source: ERS Rural Manufacturing Survey.

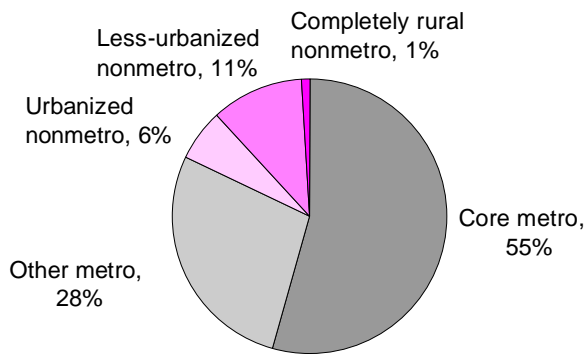
nonmetro counties, 11 percent from less urbanized counties, and only 1 percent from completely rural nonmetro counties (fig. 2). The bulk of exports originates in large cities, with 55 percent from core metro areas and 28 percent from other metro areas.

The percentage of shipments exported increases with urbanization, but exports are still an important component of rural manufacturing output. Exports are 9.5 percent of shipments for completely rural counties and 11.5 percent in core metro areas. Even though completely rural areas account for a tiny share of all exports, those exports are a significant part of their manufacturing output.

### Exporting Important in All Industries

All industries have a significant share of nonmetro plants participating in the export market (table 2). The percentage of nonmetro manufacturers with exports is as high as 84 percent in the instruments industry (SIC—Standard Industrial Classification—38), followed by 77 percent of electrical equipment manufacturers (SIC 36). The percent-

Figure 2  
**Share of manufactured exports by urbanization**  
Nonmetro plants account for 18 percent of manufactured exports



Source: ERS Rural Manufacturing Survey.

age of plants with exports is as low as 26 percent in stone, clay, and glass (SIC 32), 34 percent in the lumber and wood products industry (SIC 24), which is largely made up of logging operations and sawmills, and 35 percent in printing and publishing (SIC 27, excluding newspapers). The percentage ranges between 40 and 60 percent in most other industries.

The average share of shipments exported ranges from as high as 18-21 percent in leather, instruments, and industri-

Table 2  
**Nonmetro manufactured exports by industry, 1995**  
Food processing is the largest source of nonmetro manufactured exports

SIC code	Industry	Export plants <sup>1</sup>	Export ratio <sup>2</sup>	Export value <sup>3</sup>
		Percent		Billion dollars
20	Food and kindred	40	10	11.9
22	Textile mills	55	6	1.6
23	Apparel	45	7	1.4
24	Lumber and wood products	34	9	4.2
25	Furniture and fixtures	51	7	1.6
26	Paper and allied products	45	9	3.6
27	Printing and publishing <sup>4</sup>	35	5	.8
28	Chemicals	62	11	3.4
29	Petroleum and coal products	47	1	.2
30	Rubber and misc plastics	61	9	2.7
31	Leather and leather products	61	21	1.0
32	Stone, clay, and glass	26	8	1.8
33	Primary metals	48	7	3.6
34	Fabricated metal products	54	11	4.3
35	Industrial machinery	61	18	9.0
36	Electrical equipment	77	15	4.6
37	Transportation equipment	60	13	5.8
38	Instruments	84	20	1.4
39	Miscellaneous manufacturing	70	1	1.9

SIC = Standard Industrial Classification.

<sup>1</sup>Plants reporting export sales greater than zero.

<sup>2</sup>Exports as a percentage of shipments.

<sup>3</sup>Estimated total dollar value of nonmetro industry exports.

<sup>4</sup>Excludes newspapers.

Source: Estimated from ERS Rural Manufacturing Survey data.

### Rural-Urban Codes

This analysis uses a modified version of the ERS rural-urban continuum. Plants are classified according to the type of count where they are located. Metro refers to counties located in Metropolitan Statistical Areas (MSA's).

*Core metro:* Central counties of an MSA with population of 1 million or more.

*Other metro:* All other metro counties.

*Nonmetro urbanized:* Urban population 20,000 or more.

*Nonmetro less urbanized:* Urban population of 2,500 to 19,999.

*Completely rural:* Fewer than 2,500 people in urban places.

al machinery and equipment industries to as low as 1 percent in the petroleum and coal products industry. The share of shipments exported tends to be highest in industries that make machinery and equipment for industrial uses, such as plumbing and heating equipment, metal-working and special industrial, electric distribution equipment and electrical industrial apparatus, measuring and controlling devices, and medical instruments. Consumer and natural resource products usually have lower export ratios.

Rural development advocates often focus on natural resource-related exports because these are the largest nonmetro manufacturing industries, and use farm and forest products grown in rural areas. These industries are also the leading source of nonmetro exports in dollar value. Food processing is the leading nonmetro export industry, with exports estimated at \$11.9 billion for 1995, of which \$4.4 billion was from meat products. Lumber and wood products, furniture, and paper industries together account for over \$9.4 billion of nonmetro exports.

Industries that make equipment and parts for industrial use are also an important source of nonmetro exports because these products are usually the most competitive U.S. products on world markets. The second largest source of nonmetro exports is industrial machinery, with an estimated \$9 billion of exports. Transportation equipment (\$5.8 billion of exports, primarily motor vehicle parts and equipment), electrical equipment (\$4.6 billion), and fabricated metal products (\$4.3 billion) are also important nonmetro export industries. The exports of these industrial equipment industries combined account for about one-third of nonmetro exports, about the same share as food, lumber, furniture, and paper products. Rural economies can benefit from the opening of foreign markets for U.S. manufactures, from growth in overseas food demand, and from industrial development in other countries, which will boost demand for industrial equipment and machinery.

### North Central and Southern Regions Lead Rural Export Value

Exporting is common for nonmetro firms in all regions of the country, but plants in the Northeast and Pacific regions are the most likely to participate in export markets. About 60 percent of nonmetro plants had export sales in these two regions—a higher rate than any other region. Exports were 19 percent of shipments in the nonmetro Pacific and 12 percent in nonmetro New England—also ahead of other nonmetro regions. The nonmetro Mountain region lags others in exports (although the metro Mountain region is one of the leading export regions), but even there, 39 percent of plants have export sales that account for 6 percent of shipments.

In dollar value, the North Central and Southern regions account for the bulk of nonmetro exports because most nonmetro manufacturing is based in these regions. Of the nine census divisions, the East North Central region is the leading source of nonmetro exports (table 3). The East and West North Central regions together account for 40 percent of nonmetro exports. Another 40 percent of nonmetro exports is accounted for by the South Atlantic, and East and West South Central regions. The dollar value of exports in the New England and Pacific regions is modest because these highly urbanized regions have relatively little nonmetro manufacturing industry.

### Large Plants Account for Most Exports

Exporters and nonexporters differ in other characteristics besides the type of product they make. Understanding how exporters and nonexporters differ is important. This can help policymakers predict how the benefits of export promotion are distributed, to target export assistance toward those who need it, and to evaluate the usefulness of export promotion strategies. Export promotion programs have been criticized in the past because most benefits went to a few large companies.

An important characteristic of exporting plants is size. Plants with 250 or more employees account for 61 percent of nonmetro exports (fig. 3). Midsized plants with 50-249 employees account for another 31 percent, and plants with 10-49 employees account for only 8 percent of nonmetro exports. (The survey did not cover plants with fewer than 10 employees). Two-thirds of large plants have export sales compared with only 38 percent of small nonmetro establishments. The largest nonmetro establish-

Table 3

### Nonmetro manufactured exports by Census division, 1995

*North Central and Southern regions lead in value of nonmetro exports*

Region	Export plants <sup>1</sup>	Export ratio <sup>2</sup>	Export value <sup>3</sup>
	----- Percent -----		Billion dollars
New England	60	12	2.4
Mid-Atlantic	47	9	2.9
East North Central	49	10	16.2
West North Central	50	10	9.9
South Atlantic	43	11	11.7
East South Central	44	9	7.3
West South Central	46	8	6.9
Mountain	39	6	1.9
Pacific	62	19	4.6

<sup>1</sup>Plants reporting export sales greater than zero.

<sup>2</sup>Exports as a percentage of shipments

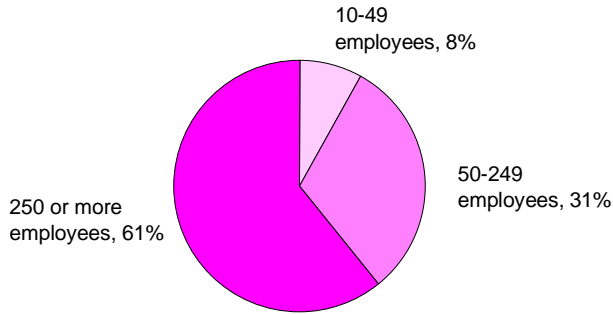
<sup>3</sup>Estimated total dollar value of nonmetro industry exports.

Source: Estimated from ERS Rural Manufacturing Survey data.

Figure 3

**Share of nonmetro manufactured exports by plant size**

*Large plants account for most exports*



Source: ERS Rural Manufacturing Survey.

ments export about 11 percent of their shipments. The export share falls to 9.4 percent for midsized plants and 7 percent for the smallest nonmetro plants. Establishments that are part of a larger multiunit firm are also more likely to produce for the export market. Nonmetro branch plants export 12.8 percent of their shipments compared with 9 percent for single-unit and headquarters plants.

**Exporters Measure Up Well Against Nonexporters**

Among nonmetro establishments, those with exports come out ahead of nonexporters in most measures of competitiveness. Nonmetro exporting plants not only tend to be larger, they grow faster and pay higher wages. Plants with exports have an average of 145 employees compared with 78 for nonexporters (table 4). Nonmetro export establishments added an average of 10 jobs between 1992 and 1995, while nonexporters added an average of 8. Sixty-one percent of exporters reported that they planned or initiated a major expansion or modernization of their plant between 1992 and 1995 compared with 53 percent of nonexporters. Exporting increases the potential market for an establishment's products and may present more opportunities for growth.

Nonmetro export plants have higher hourly wages, averaging \$9.12 per worker for production workers, while nonexporters paid an average of \$8.66. Wage growth was identical for exporters and nonexporters between 1992 and 1995 (14 percent). Competing forces affect wage growth for exporters relative to nonexporters. Overseas demand for exporters' products may allow them to pay their employees more. On the other hand, businesses selling on world markets may be more sensitive to cost increases (including labor costs) that make their products

Table 4

**Characteristics of nonmetro plants with and without exports**

*Exporters compare favorably on most performance measure means*

Characteristic	Nonexporter	Exporter
	Number	
Employees	78	145
Growth, 1992-95	8	10
	Dollars	
Production worker hourly wage	8.66	9.12
	Percent	
Growth, 1992-95	14	14
Major expansion/modernization since 1992	53	61
Product line changes in last 3 years:		
Dropped products	37	52
Added new products	71	84
Improved product design	56	68
Improved product quality	72	79
Lower production cost	44	48
Production workers with high school degree	81	84
Professional and technical employees	5	7
Use Internet	17	32
Computer links to other companies	19	36
Use employee problem-solving groups or quality circles	45	54
Use statistical process control	29	44
Use total quality management	40	50
Use outside expertise for marketing	33	52
	Average = 100	
Government programs use index <sup>1</sup>	97	127

<sup>1</sup>Government Programs Use Index is a numerical score based on respondents' rating of the importance of six types of government programs to their business operations. A score above 100 means that the respondent rated the importance of government programs more highly than the average respondent. A score below 100 means that the respondent placed relatively little importance on government programs.

Source: ERS Rural Manufacturing Survey.

less competitive. Consequently, they have greater incentive to keep growth in wages in check.

Product line changes serve as an indicator of how firms respond to changing markets to remain competitive. Exporters were much more likely than nonexporters to add, drop, and improve the design of their products. Exporters were also somewhat more likely to report that they improved product quality or lowered their production costs.

Exporters have a very slight edge in two measures of workforce skills. Eighty-four percent of production workers in export plants have at least a high school degree,

slightly more than the 81 percent at nonexporting establishments. Exporters classified 7 percent of their workers as professional or technical (engineers, scientists, computer specialists, draftsmen, lawyers) compared with 5 percent for nonexporters.

Exporters are also more likely to use new forms of work organization and management practices, including quality circles, total quality management, and statistical process control. These practices have been increasingly popular in U.S. factories as companies have given increased attention to product quality and worker productivity. An index of advanced production technology use shows that nonmetro exporters are also ahead of nonexporters in use of technologies like computer-aided design, programmable controllers, and linked-access networks.

Telecommunications technologies can help businesses stay in touch with overseas customers. As might be expected, given the importance of communications for selling overseas, nonmetro exporters are ahead in use of telecommunications technology. Thirty-two percent of exporters use the Internet and 36 percent have computer links to other companies compared with 17 and 19 percent, respectively, of nonexporters.

Not surprisingly, exporters are also more likely to use outside expertise for marketing. Fifty-two percent of nonmetro exporters used outside marketing expertise compared with 33 percent of nonexporters. The most popular sources of expertise are other branches of the plant's company, followed by local industry groups, State or national industry associations, and public or university programs.

Exporters are more likely to make use of government programs. An index based on rating of the importance of six types of programs, including various loans, tax breaks, industrial parks/enterprise zones, and training/technology programs, shows that nonmetro exporters are 27 percent above the average, while nonexporters are slightly below the average. Marketing assistance and government programs may help businesses increase exports, but the higher use by exporters may simply reflect a generally higher level of savvy and business acumen on the part of plants that export.

### Characteristics Associated With Exporting

The comparisons in table 4 indicate that exporting plants measure up well against nonexporters in many categories. However, many of these characteristics are related to one another. In particular, the larger size of exporters may account for many of their advantages shown in table 4. To measure the effects of individual characteristics on exporting, I performed a multivariate analysis of the probability of being an exporter. The results show the effect of each individual characteristic, holding other characteris-

tics constant (table 5). When this is done, there is no difference in the probability of exporting between metro and nonmetro plants. The differing characteristics of metro and nonmetro plants account for the lower nonmetro export rate.

Plant size has a positive effect on exporting. Surprisingly, single-unit plants have a higher probability of exporting when size is held constant. Use of new work organization practices and advanced production technology have no association with exporting when other characteristics are held constant. Use of telecommunications technology, however, is positively associated with exporting. Education of production workers has no effect, but plants with a higher percentage of professional and technical workers are more likely to export. Marketing assistance is strongly associated with exporting. Only two types of product

Table 5

### Plant characteristics associated with exports

*Metro location has no effect on the likelihood of exporting when plant characteristics are held constant*

Characteristic	Effect
Metro location	None <sup>1</sup>
Plant size (employment)	Positive <sup>2</sup>
Single unit firm	Positive
Use of work organization practices	None
Use of advanced technology	None
Use of telecommunications	Positive
Education of production workers (at least 90 percent HS graduates)	None
Professional and technical workers (percent)	Positive
Used outside marketing assistance	Positive
Product line changes in last 3 years:	
Dropped products	Positive
Added new products	Positive
Improved product design	None
Improved product quality	None
Lowered cost of production	None
Region (relative to West):	
North	None
South	Negative <sup>3</sup>
Midwest	None
	Number
Observations	3,158

Note: Estimates obtained using logit analysis, with dependent variable equal to 1 if the plant had exports in 1995, equal to 0 otherwise. Two-digit industry dummy variables were also included in the model.

<sup>1</sup>Not statistically different from zero.

<sup>2</sup>Positive effect, significant at 0.10 level.

<sup>3</sup>Negative effect, significant at 0.10 level.

Source: ERS analysis of Rural Manufacturing Survey data.

changes have an effect on exporting. Plants that added and dropped products were more likely to export. However, changes in design, quality, or production costs have no association with the probability of exporting. Of the four U.S. regions, plants in the South are less likely to export than those in the West and Northeast.

#### **Size More Important Barrier Than Rural Location**

Size appears to be a more important barrier to exporting than does rural location. Small plants are much less likely to export than larger plants. This probably reflects lack of information and other resources needed by small firms to enter the export market. But it could also be due to the tendency for better managed firms (who are also more likely to export) to grow faster than poorly managed firms. This may also explain why larger (successful) firms and plants are more likely to have exports than smaller (less successful) plants at a particular point in time. Public officials should be aware that much of the benefit of export promotion programs goes to large businesses, which has been a point of criticism in the past. Assistance in identifying and developing overseas market opportunities should be targeted to smaller businesses.

While exporters are among the more successful firms, government officials and business leaders should be careful in identifying exporting plants as necessarily "good" plants. Businesses that export provide higher paying

jobs, grow faster, are more likely to consult outside experts for marketing assistance, and place a higher importance on government programs. Research by Bernard and Jensen (1995) found cross-sectional results similar to this study, but when they followed plants over time they found that exporting was not a good predictor of success. Exporting businesses apparently are among the more astute and successful. However, the United States has the advantage of a huge domestic market with growing demand for many products, and it is possible for many types of businesses to succeed without selling overseas. An export strategy may not be the best approach for all firms or communities.

#### **For Further Reading...**

A. B. Bernard and J. Bradford Jensen, "Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-87," *Brookings Papers on Economic Activity: Microeconomics*, 1995, pp. 67-119.

Bureau of the Census, *U.S. Commodity Exports and Imports as Related to Output: 1993 and 1992*, OEI/93, September 1995.

Federal Reserve Bank of Chicago, "Global Linkages to the Midwest Economy," *Assessing the Midwest Economy* workshop series, No. 6, September 18, 1996.

