

## Most Jobs Created by Exports Are in Medium- and High-Skill Occupations

*U.S. jobs supported by exports are more concentrated in medium- and high-skill occupations compared with jobs displaced by imports, about half of which are in low-skill occupational categories. Exports also seem to be linked to increasing skill requirements for workers in rural manufacturing businesses. However, analysis of long-term trends in job creation shows that domestic demand generates most high-skill jobs.*

Opponents of free trade argue that imports from low-wage countries lead to job losses for middle class workers. These concerns are receiving increased attention as economic downturns in Asia, Russia, and Latin America and a relatively strong dollar swell the U.S. trade deficit. This issue is an important one for rural America, because low-skill manufacturing jobs—the most vulnerable to foreign competition—have been an important source of good wages and benefits for residents of rural areas without a college education.

A new analysis of employment related to U.S. international trade during 1972-92 shows that the United States exports goods that are relatively skill-intensive compared with its imports (see “Estimating Trade-Related Employment”). Figure 1 shows that 19 percent of jobs supported by U.S. exports were in high-skill white-collar occupations (jobs that generally require a 4-year or 2-year college degree). Thirty-five percent of export-related jobs were in medium-skill occupations that included a mix of white-collar jobs often not requiring college (clerical and sales) and blue-collar jobs requiring significant skills that can be obtained through experience on the job (precision production, craft, and repair jobs). Forty-six percent of export jobs were in low-skill occupations (machine operators, fabricators, laborers, food service, custodial, agricultural, forestry, and fishing jobs). If the goods imported to the United States in 1992 had been produced domestically, they would have generated an almost equal number of jobs, but 54 percent of those jobs would have been in low-skill occupations, a higher percentage than the 46 percent low-skill share of export jobs. An estimated 18 percent of import jobs would have been high-skill jobs (about the same as the 19-percent high-skill share for exports) and 28 percent medium-skill (less than the 35-percent share for exports). These estimates confirm that jobs displaced by imports are predominantly low-skill, while exports create more medium-skill jobs, reflecting the U.S. competitive advantage in skill-intensive goods and services.

Goods and services produced for the domestic market are much more skill-intensive than either exports or imports (fig. 1). Seventy percent of jobs supported by domestic demand (purchases by U.S. consumers, business investment demand, and government purchases of goods and services) are in either high- or medium-skill occupations compared with 54 percent for exports and 46 percent for imports. The difference is partly explained by the important share of services (among the more skill-intensive sectors) in domestic demand. Imports and exports consist largely of manufactured and agricultural goods, which are less skill-intensive.

### Domestic Demand Creates Skilled Jobs

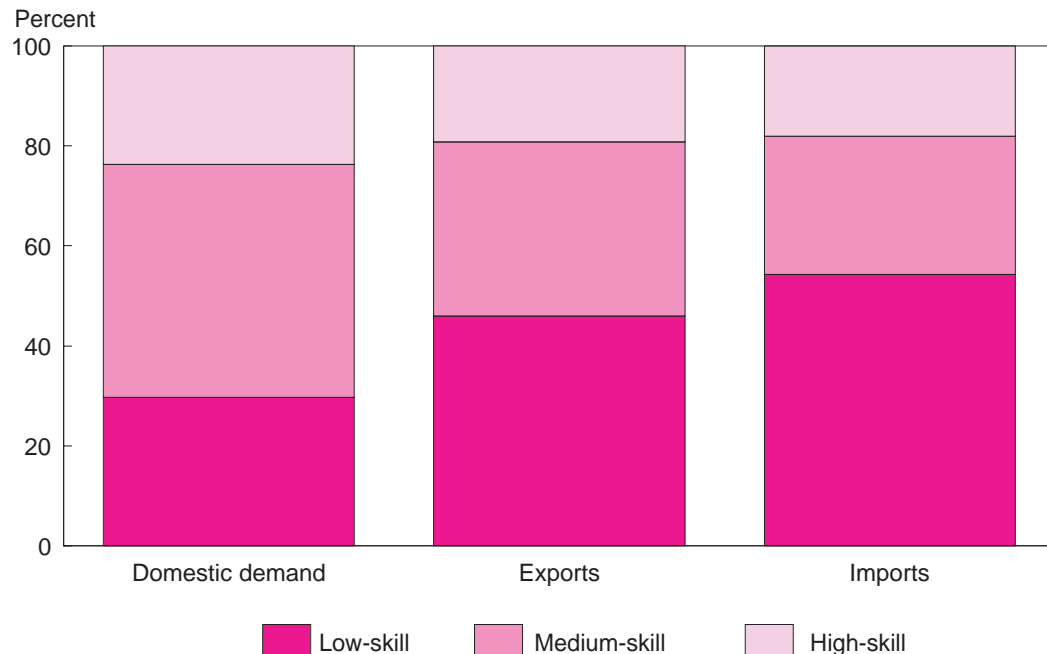
U.S. jobs displaced by imports are slightly greater than the number created by exports (consistent with the Nation’s negative trade balance). In 1992, exports supported 9.1 million jobs, and imports displaced an estimated 9.7 million, an estimated net loss of 627,000 jobs (table 1). When viewed in context of the national economy, however, international trade is only a minor factor in explaining overall trends in U.S. employment. The net loss of 627,000 jobs due to international trade is only 0.5 percent of all U.S. jobs (121 million). Even the net loss of 2.2 million jobs due to trade in 1987 (when the U.S. trade deficit was unusually high) represented only 2 percent of total employment.

Some observers have argued that growth of imports has led to increasing earnings inequality as opportunities erode for less-skilled workers, while demand and wages for high-skilled workers continue to increase. Careful studies of the data have shown that the magnitude of job loss associated with increasing imports over the past several decades was not nearly large enough to explain the overall shifts in the U.S. job market. Studies have found that the trend toward more skilled workers occurred in all industries, including those that produced goods and services for the domestic market. Only a minor part of the decline in production workers was due to the decline of import-sensitive industries. Over the two decades from

Figure 1

**Skill share of jobs, by type of demand, 1992**

*Most jobs displaced by imports are low-skill*



Source: Calculated by ERS using data from the Department of Commerce and Bureau of Labor Statistics.

Table 1

**Employment attributed to exports, imports, and domestic demand, 1972-92**

*International trade accounts for a small share of the longrun change in jobs*

Source of jobs	1972	1987	1992
		1,000 jobs	
Net effect of trade	-140	-2,196	-627
Exports	3,574	6,592	9,114
Imports <sup>1</sup>	-3,714	-8,788	-9,741
Total U.S. jobs	84,586	114,366	121,000

<sup>1</sup>Number of jobs that would be required to produce imported goods in the United States.

Source: Calculated by ERS using data from the Department of Commerce and Bureau of Labor Statistics.

1972 to 1992, the U.S. economy added 36 million jobs, but the employment effects of exports and imports offset each other. Jobs attributed to exports increased by an estimated 5.5 million between 1972 and 1992, while increased imports displaced the equivalent of 6.0 million.

**Exporting Businesses Raise Skill Requirements**

While the net employment effect of trade is small, these numbers may understate the importance of exports. Another recent ERS study (H. F. Gale, "Rural Manufacturers in the Export Market," *Rural Development Perspectives*, Vol. 13, No. 2, August 1998, pp. 24-30) looked at involvement of rural and urban manufacturing businesses in the export market, and found

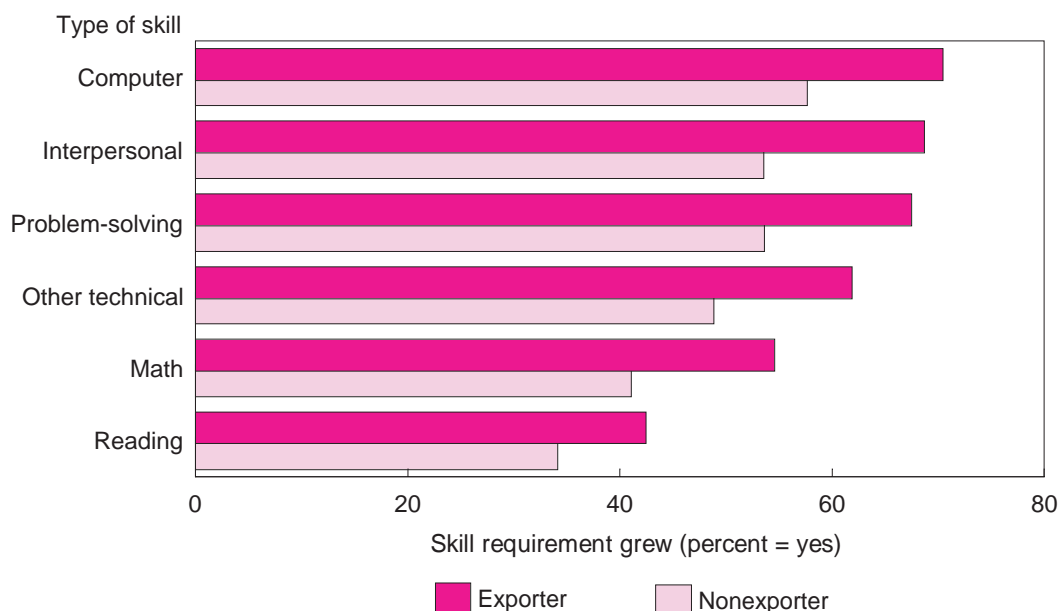
that exports have an important positive association with business performance and demand for skilled workers in both urban and rural areas. The study, based on ERS's 1996 Rural Manufacturing Survey, indicates that nearly half of nonmetro manufacturing establishments sell at least part of their output in export markets. Estimated nonmetro exports amounted to about \$64 billion in 1995, or about 10 percent of nonmetro manufacturing shipments in that year. This research also found that nonmetro plants with exports are larger, grow faster, pay higher wages, and are more likely to make product improvements and to use innovative management practices and telecommunications technology.

Additional analysis of these data shows that exporters have more rapidly growing skill demands than nonexporters. For example, in 1996, 70 percent of manufacturing plants with exports said their requirements for computer skills increased over the previous 3 years compared with 57 percent of nonexporters. Exporters were more than 10 percentage points more likely than nonexporters to report an increase in each of six employee skill requirements (fig. 2). When asked about problems finding different types of skills, exporters were also more likely than nonexporters to report problems finding workers with adequate interpersonal/teamwork, computer, and other technical skills. (Similar percentages of exporters and nonexporters report problems finding workers with the most problematic skills: reliable and acceptable work attitude and problem-solving.) Exporters are also doing more to upgrade their workers' skills. Fifty-five percent of nonmetro exporters said they provided formal training (classes or courses to learn new skills and technologies) compared with only 41 percent of nonexporters.

Other research has found an association between exports and business performance, but a direct link between exports and business success has not been established. Bernard and Jensen ("Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-87," *Brookings Papers in Economic Activity: Microeconomics*, 1995, pp. 67-119) followed a large sample of manufacturing establishments over time and concluded that exporting, by itself, was not a good predictor of success. Exporting may just be one expression of a higher

Figure 2  
**Reported increase in skill requirements by nonmetro manufacturing employers, 1994-96**

*Exporting establishments were more likely to report increases in all types of skill requirements*



Note: Chart shows percentage of establishments reporting that the skill requirement "increased a lot" or "increased somewhat."

Source: Analysis of ERS's 1996 Rural Manufacturing Survey, weighted for stratification.

degree of management skill and business acumen, rather than the single key to business success. Nevertheless, exposure to world markets seems to raise competitiveness and productivity of businesses. The effect of exposure to world markets (pressure to increase productivity, reduce costs, adopt the latest technologies, and upgrade worker skills) reaches manufacturing plants even in the most remote rural areas.

### **Implications for Rural Areas**

The Census Bureau's *Annual Survey of Manufactures* indicates that the mix of white-collar "nonproduction workers" (managers and professionals) and less skilled blue-collar production workers in manufacturing has stabilized during the 1990's. However, salaries and wages for white-collar workers have climbed faster than wages for blue-collar "production workers." Competition from low-cost foreign competitors may have played a role in this divergence by inducing manufacturers to hold down production worker wages and move operations to nonunion plants. At the same time, many companies cut back on the number of middle managers in the early 1990's, which may have boosted average white-collar wages. Whatever the cause, it seems clear that the earnings premium for skilled over less-skilled workers is increasing. This is a concern for rural areas, since they tend to attract relatively few skilled jobs. In 1992, nonmetro areas had 25.6 percent of production (less-skilled) workers in manufacturing, but only 13.5 percent of nonproduction (skilled) workers.

Rural communities can prepare themselves to compete in domestic and world markets by developing a labor force with the skills and flexibility that modern employers demand. Higher productivity, obtained through technical knowledge and ability, good work attitude, and skills in teamwork and problem-solving, can enhance rural business competitiveness not only in international markets but also in the vast domestic market. Service jobs, the fastest-growing segment of the labor market, are created primarily by domestic demand, and have historically been located in urban areas. While many service jobs are in low-skill occupations (for example, food service, clerical, administrative support), service industries also employ a large share of workers in high-skill professional occupations, including administrative, engineering, legal, and health services. Rural areas also face the challenge of retaining the most-skilled (college-educated) workers, who often migrate to high-skill jobs in urban areas. [Chin Lee, 202-694-5354, [chinlee@econ.ag.gov](mailto:chinlee@econ.ag.gov); Gerald Schluter, 202-694-5395, [schluter@econ.ag.gov](mailto:schluter@econ.ag.gov); Fred Gale, [fgale@econ.ag.gov](mailto:fgale@econ.ag.gov), 202-694-5349]

### Estimating Trade-Related Employment

When economists want to know how much employment is generated throughout the economy by exports, they estimate the “factor content” of international trade. This type of analysis uses an input-output model of the U.S. economy to estimate all the purchases from various sectors of the economy needed to produce goods sold for export. For example, if the United States exported \$10 million worth of steel, the input-output model would provide an estimate of how much output would be required from each sector of the economy to produce that much steel. Employment requirements to produce the steel are estimated by multiplying these outputs by ratios of employment per unit of output.

A study by Chinkook Lee and Gerald Schluter (“Effect of Trade on the Demand for Skilled and Unskilled Workers,” *Economic Systems Research*, Vol. 11, No. 1, 1999, pp. 49-65) used this technique to look at how changes in exports, imports, and domestic demand affected employment of high-, medium-, and low-skill workers for the years 1972, 1987, and 1992. They classified demand for goods and services produced in the economy into four categories: consumer spending (C), business investment (I), government purchases (G), and net exports: exports (X) minus imports (M). For this study, C+I+G are termed domestic demand.

The economy was divided into 80 sectors or industries. Using a standard input-output model of the economy, Lee and Schluter estimated the employment requirements in each of 80 sectors of the economy needed to support domestic and export demand for goods and services. They also estimated the employment that would be needed to produce the Nation’s imports if they were manufactured domestically.

Lee and Schluter estimated the skill content of employment by classifying the nine major Bureau of Labor Statistics occupational groups into high-, medium-, and low-skill categories (see table below). The high- and medium-skill groups roughly correspond to the “nonproduction workers” classification used by the Census Bureau in reporting Annual Survey of Manufactures (ASM) data, while the low-skill group roughly corresponds to “production workers.” (A number of previous studies used ASM data, equating nonproduction workers with high skill, and production workers with low skill.) The authors report that their overall results did not change when they used alternative skill classifications. This classification system differs slightly from the system used in “Future Job Growth Will Benefit Educated Workers Most,” which reports expected employment growth for occupations by the amount of education and training required.

Lee and Schluter compared the number of jobs at various skill levels created by the three different components of demand. Estimates were made for 3 years: 1972, 1987, and 1992 to evaluate trends over the past two decades.

#### Skill classification of workers

*Occupational groups were classified into three skill levels*

Skill category	Occupations
High-skill	Executive, administrative, and managerial jobs Professional specialty Technicians and related support
Medium-skill	Sales occupations Administrative support, including clerical Precision production, craft, and repair
Low-skill	Service occupations (for example, food service, clerks, custodial services) Operators, fabricators, and laborers Farming, forestry, and fishing

Source: Classification of BLS occupations used by Lee and Schluter.