This is evidenced by the exports of chemicals of the free-world European countries (OECD), from 1960 to 1966 which increased from $4.4 billion to $8.5 billion, or 93 percent, while the U.S. exports increased from $1.8 billion to $2.7 billion, only 50 percent. During the same period, total sales of chemicals by the same European countries increased by about 69 percent, while total sales by U.S. chemical companies increased only 40 percent.

COMPARISON OF GROWTH IN CHEMICAL INDUSTRY TURNOVER AND EXPORTS UNITED STATES VERSUS EUROPEAN OECD COUNTRIES

[Dollar amounts in billions]

	Turnover		Exports	
	United States	European OECD	United States	European OECD
1960	$27.6	$19.7	$1.8	$4.4
1966	38.7	33.2	2.7	8.5
Increase	11.1	13.5	1.2	4.1
Average annual increase (percent)	5.8	9.1	6.9	11.6

In light of these facts, it will become increasingly difficult for the U.S. chemical industry to continue as a major contributor to the balance of trade.

B. Competitive Position of U.S. Chemical Industry in World Markets

During World War II, much of the foreign chemical industry, particularly in Europe and Japan, where a large part of it was located, was destroyed. Consequently, at the end of the war the U.S. chemical industry had a broad market for its products with little or no competition. This situation has changed in the last 20 years as foreign producers have acquired the latest technology, rebuilt, and made rapid advances in production.

Since the chemical industry is one in which national levels of technology are now substantially equal, there are several other factors which have contributed to the Progress of the foreign chemical industry:

New foreign plants are automated, embody the latest processes and techniques, and increasingly enjoy the advantages of high volume production.

Antitrust laws and practices in other countries permit rationalization of production, cartel selling, and other actions favoring their domestic industry.

Wages in Europe and Japan are well below those of the U.S., and in addition, the productivity of their workers has increased rapidly.

Raw materials are often cheaper abroad.

There is much dispute about relative costs of making products in the U.S. and abroad. We know that in spite of the efficiency and automation of the U.S. chemical industry, many chemicals are made cheaper abroad. The reasons are many and varied. In a recent survey by *Chemical and Engineering News*, it was determined that seven of the largest U.S. chemical producers paid to employees an average of 4.5 percent more in 1967 than the year before. At the same time, sales per employee gained only 2 percent. Also, productivity is simply not keeping pace with rising costs.

Productivity, a key measure of the ability to compete, is sometimes mistakenly demonstrated by the value of production per employee. U.S. chemical output per employee in sales dollars is much higher than that of its trading partners. However, a recent study indicated that a truer index of productivity, when comparing companies or industries in different countries, is measured by calculating the ratio of the dollars of value added to dollars of employee cost. When firms with approximately the same product mix are compared on this basis, the Japanese chemical companies have the highest productivity with a ratio of 3.03, followed by Germany with 2.55; U.S., 2.00; and U.K., 1.70.[1]

Since the employee cost makes up an important part of the sales costs, 27.2 percent for the U.S. in 1967, another effective way of demonstrating relative competitive position of chemical industries in different countries is to compare

[1] "Financial Comparison of World Chemical Companies," C. P. Neidig, *Financial Analyst Journal*, January–February 1968.