

**OHIO DEPARTMENT OF DEVELOPMENT**  
**Office of Strategic Research**

**THE OHIO MACHINERY INDUSTRY**



**July, 2005**

**A State Affiliate of the U.S. Census Bureau**



Bob Taft, Governor

Bruce Johnson, Director

# **THE OHIO MACHINERY INDUSTRY**

**JULY 2005**

BA5 Don Larrick, Principal Analyst  
Office of Strategic Research, Ohio Department of Development  
P.O. Box 1001, Columbus, Oh. 43216-1001  
Production Support:  
James Kell and Steve Kelley, Editors  
Robert Schmidley, GIS Specialist

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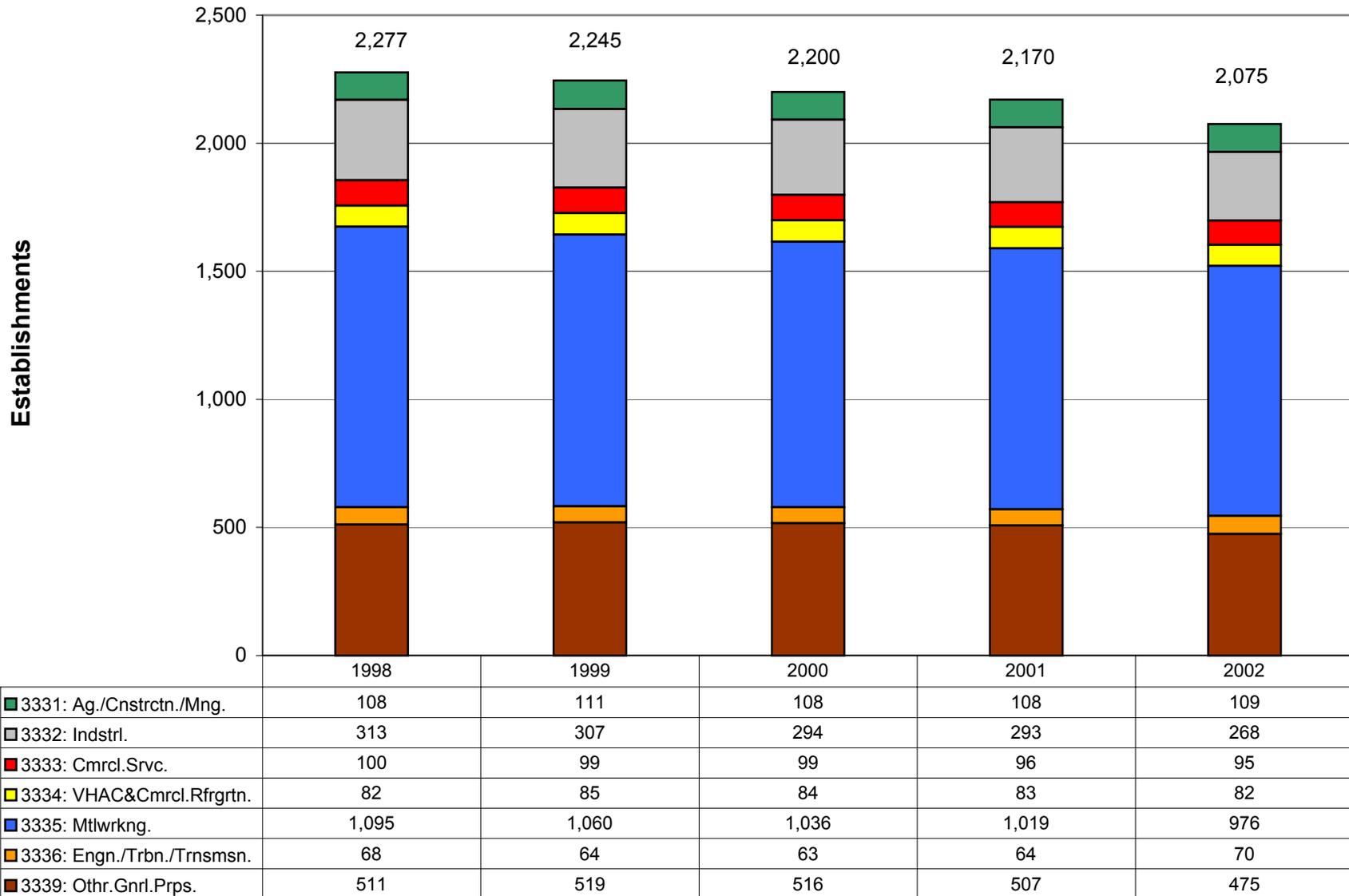
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## TRENDS

## Establishment Trends in Ohio's Machinery Industry: 1998-2002



Source: U.S. Census Bureau.

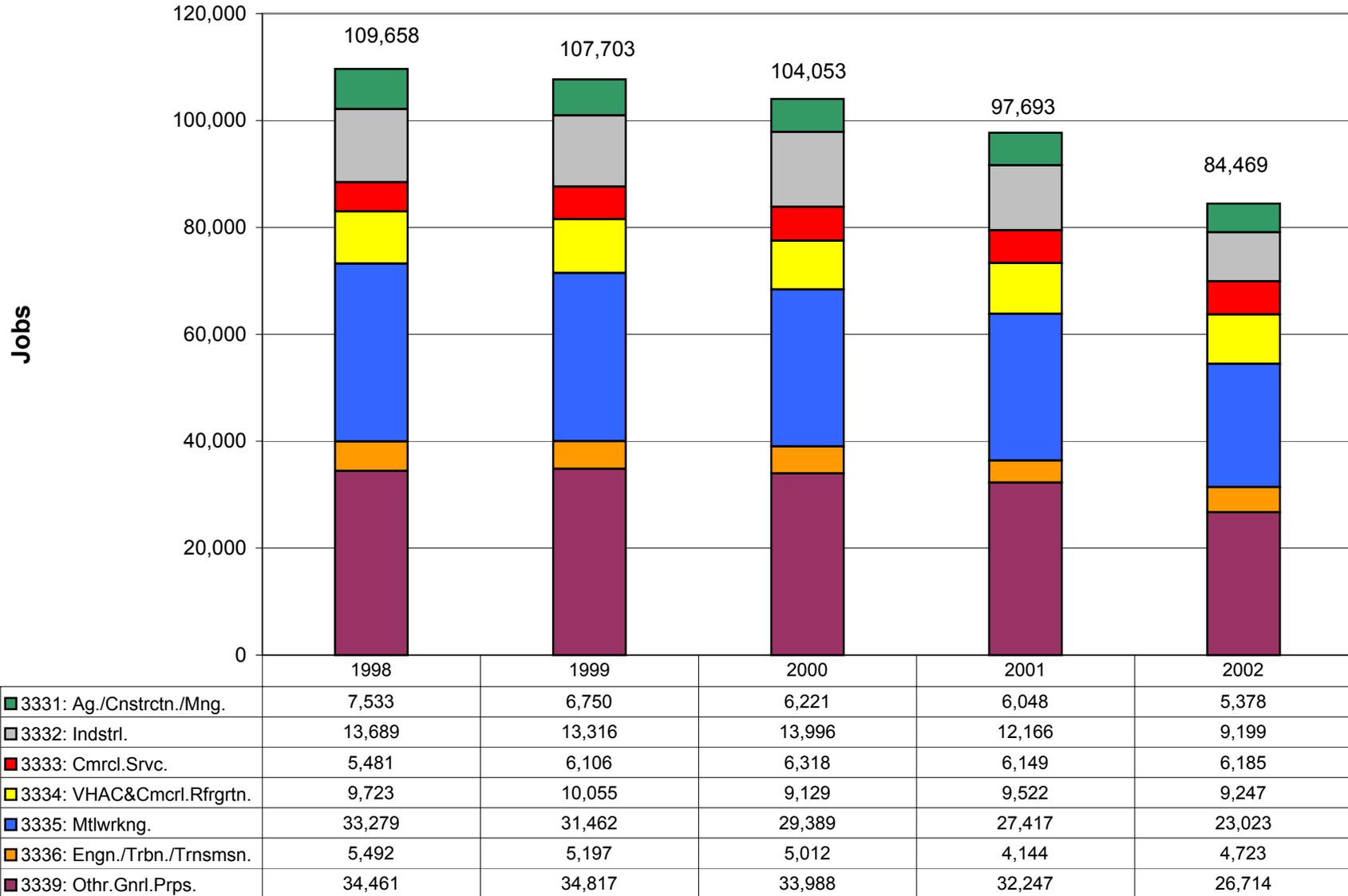
## ESTABLISHMENTS

Machinery industry establishments as a whole (NAICS 333) declined in Ohio since the implementation of NAICS (1998). The chart above shows that the total fell every year from 2,277 in 1998 to 2,075 in 2002 – the latest year for which figures are available. This is a loss of almost nine percent in four years. The chart above also shows that the declining number of establishments was concentrated in the three largest groups: industrial machinery (3332, down 14 percent), metal-working machinery (3335, down almost 11 percent), and other general-purpose machinery (3339, down 7 percent). The loss of five commercial and service industry establishments (3333) is slight. The numbers of establishments in other industry groups appear to have fluctuated; no trends are apparent.

What happened in Ohio was similar to what happened in the nation as a whole. Data in the appendix table show a steady decrease in the total number of machinery industry establishments in the U.S. This description is more or less accurate for every industry group; for some, the losses of establishments began after 1998. The data in the appendix table also show that the total number of manufacturing establishments (31-33) in Ohio and the nation decreased, albeit at a slower rate than in machinery manufacturing.

See Table A7

## Employment Trends in Ohio's Machinery Industry: 1998-2002



Source: U.S. Census Bureau.

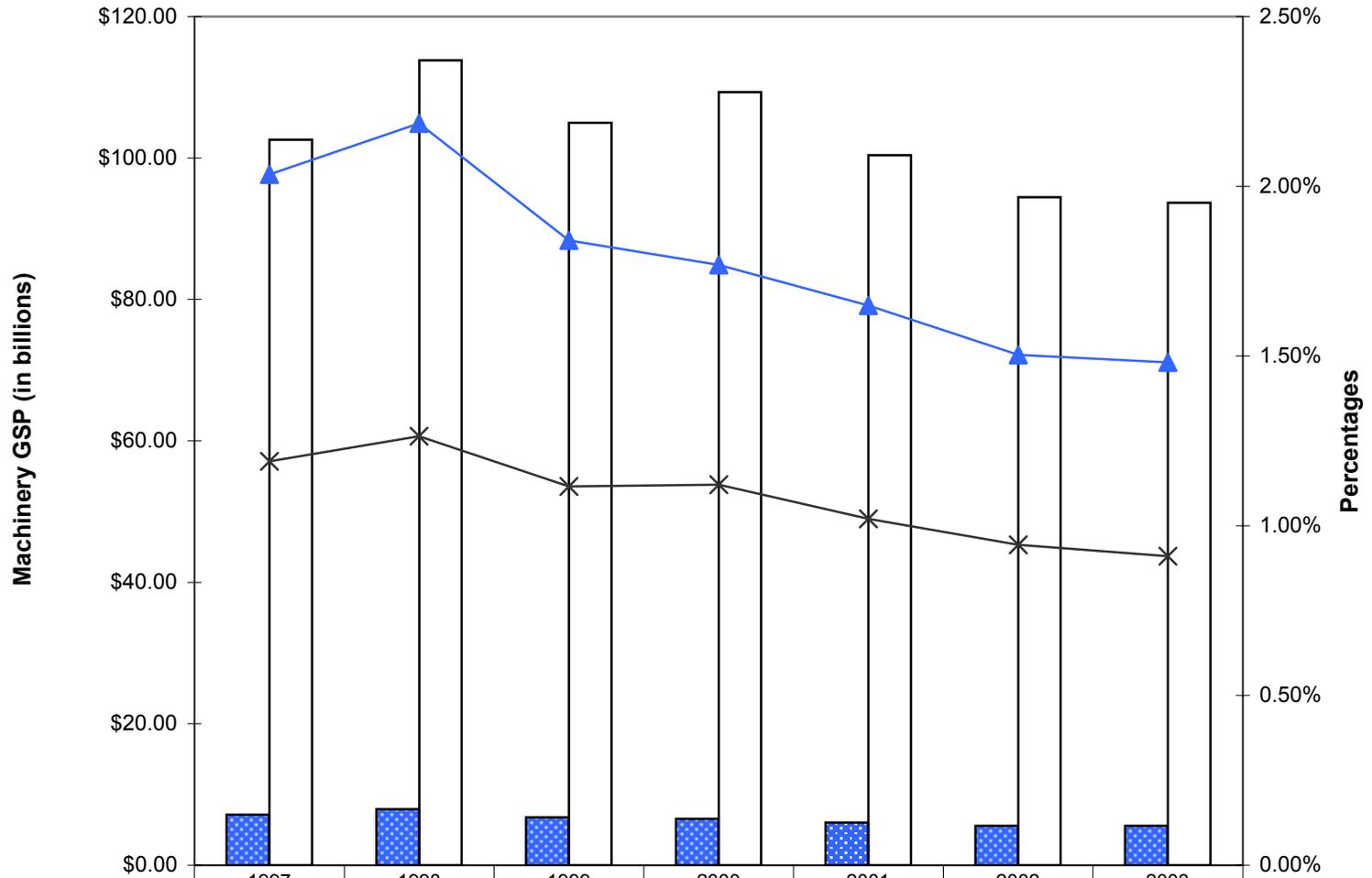
## EMPLOYMENT

Employment in machinery manufacturing as a whole (NAICS 333) declined in Ohio since the implementation of NAICS (1998). The chart above shows that employment fell every year from over 109,000 in 1998 to less than 85,000 in 2002 – the latest year for which figures are available. This is a loss of 23 percent in just four years. The chart above also illustrates that employment in every group except commercial and service industry machinery (3333) was lower in 2002 than in 1998. The majority of job losses – 18,000 – occurred in metalworking (3335) and other general-purpose machinery (3339). It may be noteworthy that employment in engine, turbine & transmission equipment (3336) increased from 2001 to 2002.

What happened in Ohio was more or less part of what happened in America. Data in the appendix table show that national machinery industry employment fell each year, declining by 19.3 percent for the period, and national employment figures for every industry group were lower in 2002 than in 1998. The appendix table also shows that the job losses in machinery manufacturing were relatively greater than in the manufacturing sector (31-33). From 1998 through 2002, 16.6 percent of all manufacturing jobs in Ohio disappeared while 15.5 percent of such jobs in America vanished.

See Table A8

## Machinery Manufacturing's Roles in Ohio & U.S. Economies



Ohio Machinery GSP	\$7.13	\$7.92	\$6.77	\$6.57	\$6.03	\$5.55	\$5.57
U.S. Machinery GSP	\$102.58	\$113.80	\$104.96	\$109.30	\$100.40	\$94.45	\$93.65
Machinery as Percent of Ohio Total	2.03%	2.19%	1.84%	1.77%	1.65%	1.50%	1.48%
machinery as Percent of U.S. Total	1.19%	1.26%	1.12%	1.12%	1.02%	0.94%	0.91%

Source: U.S. Bureau of Economic Analysis.

## GROSS STATE PRODUCT

As previously mentioned, Gross State Product (GSP) data are summary figures for the net value of goods and services provided by people and capital in each industry of every state. Real changes in the economy and constituent industries – i.e., the volume(s) of goods produced and services provided – can be discerned only after accounting for inflation. The chart above illustrates real changes in volume of machinery produced from 1997 through 2003: output in Ohio peaked in 1998 and declined every year through 2002 before increasing by \$20 million (M) in 2003. The net change was a nearly 22 percent drop in production. The decline across the country was less pronounced: 8.7 percent – from \$102.58 billion (B) to \$93.65B.

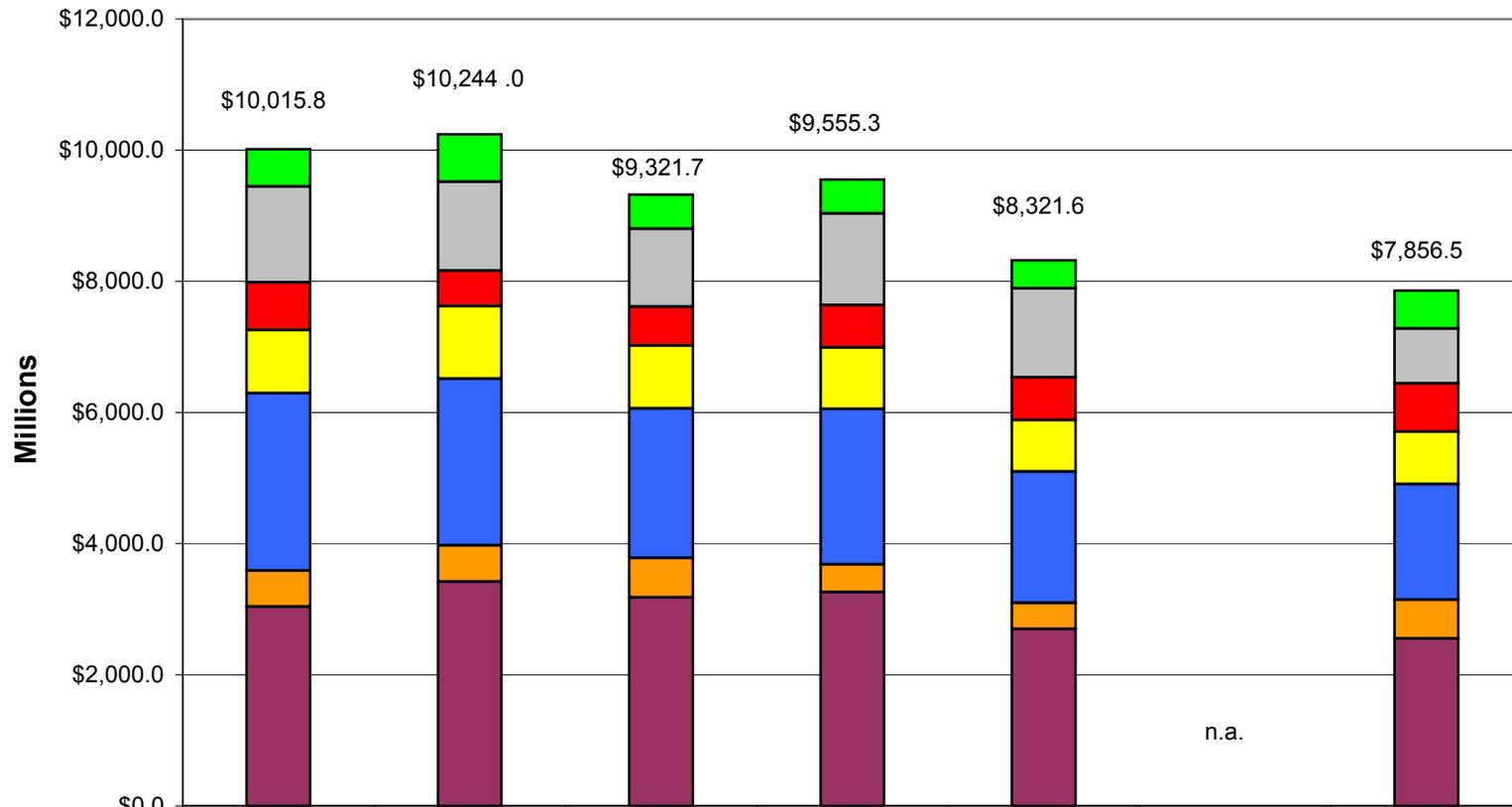
During the same time both Ohio's and America's economies experienced overall real growth. Consequently, machinery industry output also declined as a percentage of total output both in Ohio and across the nation. The chart above shows that machinery comprised 2.19 percent of Ohio's total in 1998, but only 1.48 percent of the total in 2003. Similarly, national industry output fell from 1.26 percent of the U.S. total to .91 percent.

The industry remains concentrated in Ohio: 5.94 percent of U.S. machinery industry output originated in Ohio during 2003, while 3.65 percent of all goods and services came from Ohio that year. However, the industry is not quite as concentrated here as it was in 1998 when 7.96 percent of industry output came from Ohio and the state was the source of 4.03 percent of all goods and services in the nation.

Whether these changes reflect the cyclical nature of the industry or a structural change in the economy – or both – cannot be determined from this data during such a short time period.<sup>6</sup> Some industry analysts think that these changes are a result of lower manufacturing costs in a rapidly industrializing China (Business Week, 2004).

See Table A9

## Value-Added by Group in Ohio, 1997-2003



	1997	1998	1999	2000	2001	2002	2003
■ 3331: Ag./Cnstrctn./Mng.	\$565.6	\$721.9	\$517.0	\$523.0	\$429.7	\$0.0	\$576.0
■ 3332: Indstrl.	\$1,463.9	\$1,357.7	\$1,193.1	\$1,392.7	\$1,356.9	\$0.0	\$835.6
■ 3333: Cmrcl. & Srvc.	\$729.5	\$542.0	\$590.8	\$649.4	\$648.7	\$0.0	\$740.6
■ 3334: VHAC/Cmrcl.Rfrgrtn.	\$964.2	\$1,105.6	\$956.7	\$936.1	\$787.9	\$0.0	\$799.5
■ 3335: Mtlwrkng.	\$2,703.6	\$2,543.3	\$2,283.3	\$2,371.7	\$2,001.2	\$0.0	\$1,758.8
■ 3336: Engn./Trbn./Trnsmsn.	\$548.8	\$555.3	\$601.2	\$421.6	\$403.0	\$0.0	\$592.4
■ 3339: Othr.Gnrl.Prps.	\$3,040.1	\$3,418.2	\$3,179.7	\$3,260.9	\$2,694.3	\$0.0	\$2,553.6

Source: U.S. Census Bureau. Note: n.a. - not available.

## VALUE-ADDED BY GROUP

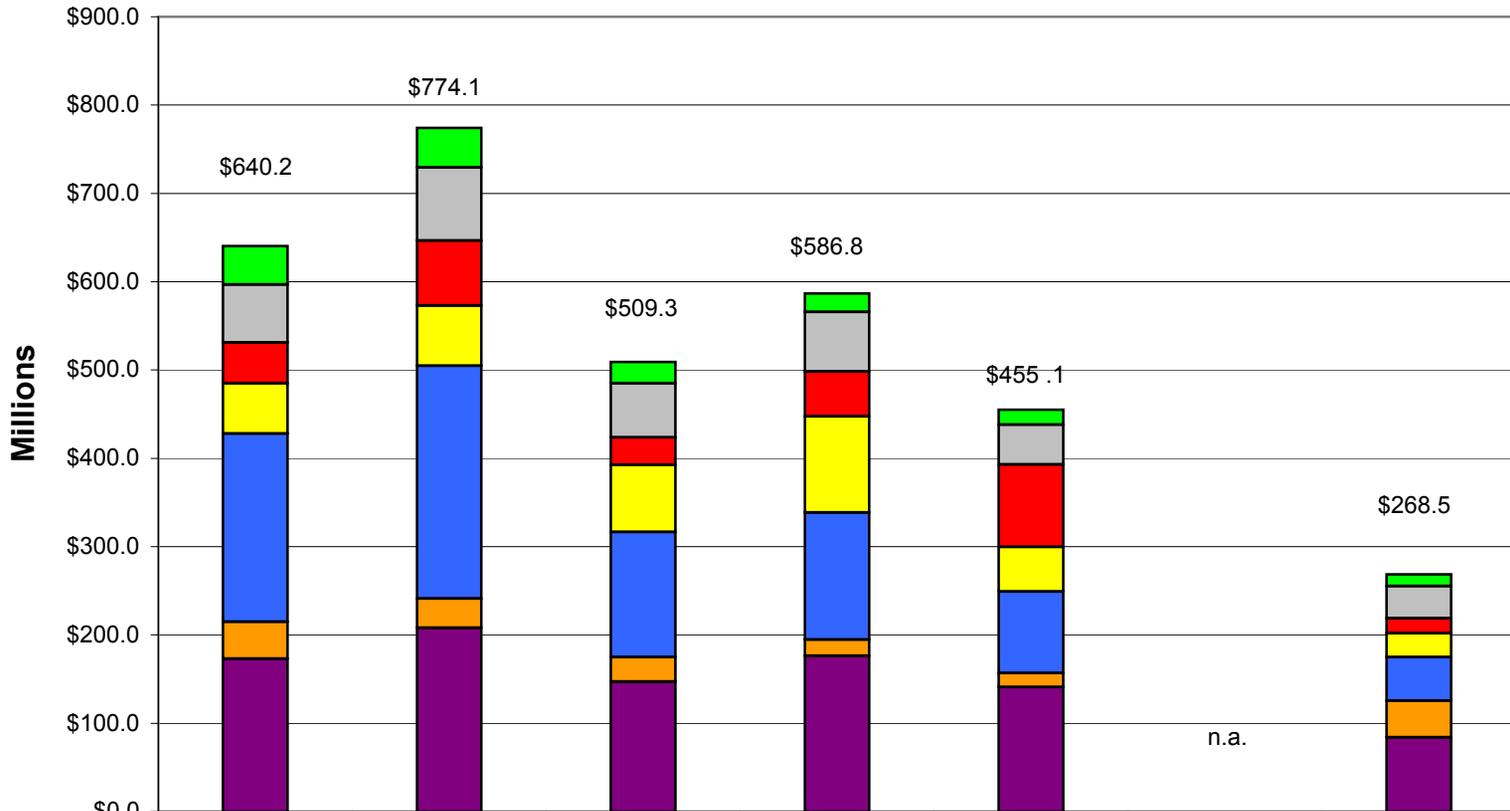
As before, value-added data provide additional insight into the machinery industry. Although the chart above makes no adjustment for inflation, it shows that the declining industry (NAICS 333) output was spread across four of the seven groups. Only in engines, turbines, and transmission equipment (3336) does output appear to be even somewhat greater in 2003 than in 1997 – and only after a drop in production during 2000 and 2001. Similarly, the output of commercial and service industry machinery (3333) fell in 1998 before recovering to its 1997 level in 2003. Output of agricultural, construction, and mining machinery (3331) fluctuated, but was little changed. (Group data from the 2002 Census of Manufactures are unavailable as this is written.)

Nationally, five of the seven industry groups showed declines, aggregating to a net industry decline during the same time. The notable differences from Ohio were the national decrease in commercial and service industry output and the apparent increase in output of VHAC and commercial refrigeration equipment (3334).

The net effect of these changes was that the concentration of commercial and service machinery manufacturing in Ohio increased while concentration of other industry group production here decreased, except for that of agricultural, construction, and mining machinery (3331), which showed a slight increase.

See Table A10

## Capital Expenditures by Group in Ohio, 1997-2003



	1997	1998	1999	2000	2001	2002	2003
■ 3331: Ag./Cnstrctn./Mng.	\$43.5	\$44.5	\$24.5	\$20.9	\$17.1	\$0.0	\$13.2
■ 3332: Indstrl.	\$65.6	\$83.0	\$61.2	\$67.5	\$45.0	\$0.0	\$36.6
■ 3333: CmrcL. & Srvc.	\$46.0	\$73.5	\$30.8	\$50.9	\$93.4	\$0.0	\$16.9
■ 3334: VHAC/CmcrL.Rfgrtn.	\$57.1	\$68.4	\$76.2	\$108.9	\$50.5	\$0.0	\$27.0
■ 3335: Mtlwrkng.	\$213.0	\$263.5	\$141.9	\$143.7	\$92.4	\$0.0	\$49.1
■ 3336: Engr./Trbn./Trnsmsn.	\$41.8	\$33.2	\$27.5	\$18.4	\$15.6	\$0.0	\$41.7
■ 3339: Othr.Gnrl.Prps.	\$173.2	\$208.0	\$147.2	\$176.4	\$141.2	\$0.0	\$83.9

Source: U.S. Census Bureau. Note: n.a. - not available.

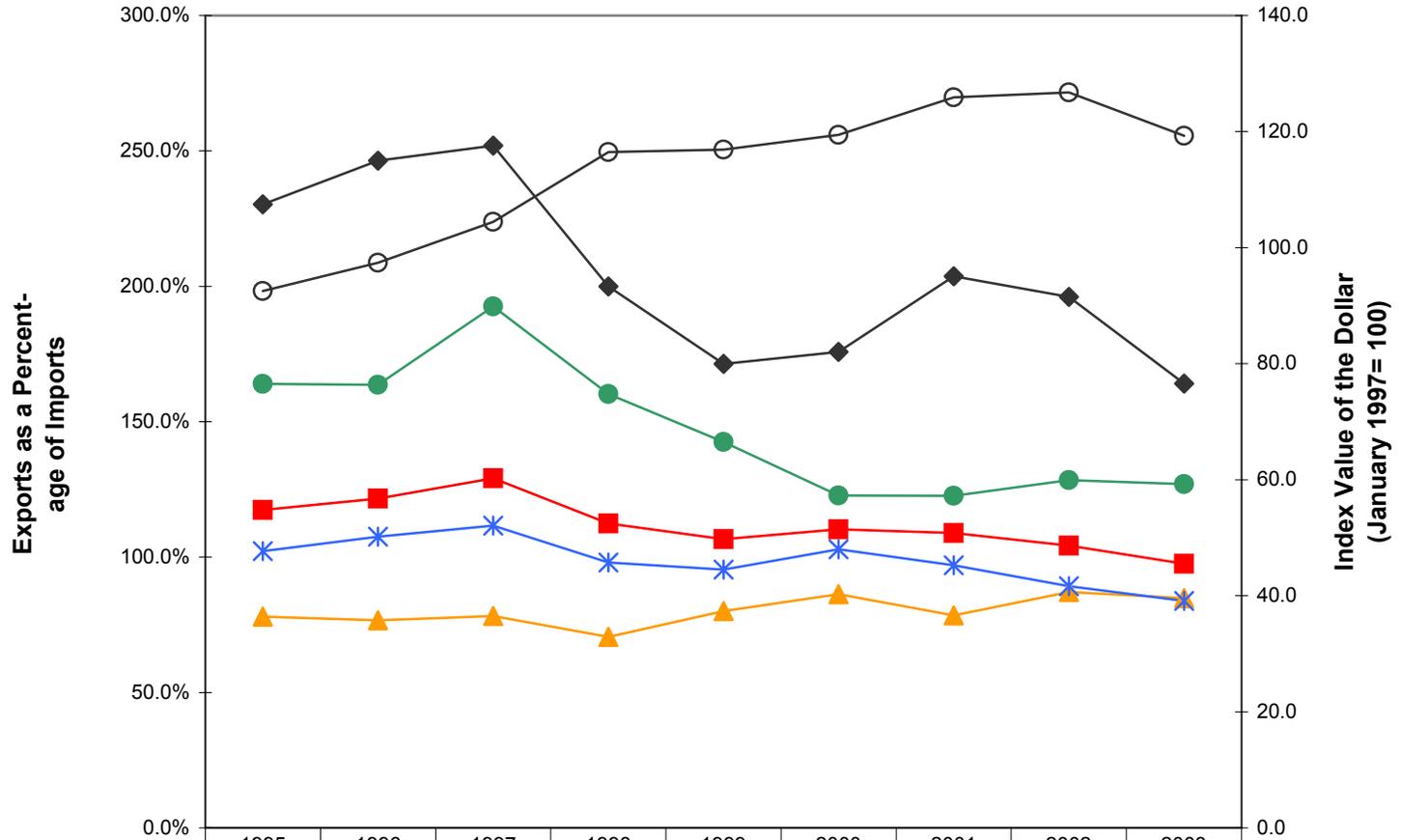
## CAPITAL EXPENDITURES BY GROUP

The chart above shows that capital expenditures in Ohio in the machinery industry fell from a peak of \$774.1 million (M) in 1998 to \$268.5M in 2003, although the decline was interrupted by an increase from \$509.3M in 1999 to \$586.8M in 2000. Expenditures were down in every group except for engine, turbine, and transmission equipment (NAICS 3336), which was little-changed from 1997. Even for this last group, capital expenditures fell from 1998 through 2001 before rebounding in 2003. (As with value-added, the chart above makes no adjustment for inflation, and data from the 2002 Census of Manufactures are unavailable as this is written.) Data in table A11 show that the group trends were usually more pronounced in Ohio than in the nation as a whole. The most notable exception was engine, turbine, and transmission equipment, which fell at the national level.

Capital expenditures in Ohio by industry companies generally have been less-than-proportional to the value-added originating in the state; the proportion of national capital expenditures going into Ohio averaged only 95 percent of the proportion of value-added originating here. The exceptions to this were activity in commercial and service (3333) and VHAC and commercial refrigeration equipment (3334).

See Tables A10 & A11

## U.S. Exports as a Percentage of Imports with the Index Value of the Dollar



	1995	1996	1997	1998	1999	2000	2001	2002	2003
Overall summary	117.4%	121.7%	129.1%	112.4%	106.6%	110.3%	108.9%	104.3%	97.5%
Oil drilling, mining, construction	230.3%	246.4%	252.0%	199.9%	171.3%	175.8%	203.7%	196.2%	164.1%
Industrial engines, pumps, compressors	163.9%	163.6%	192.6%	160.2%	142.5%	122.7%	122.6%	128.4%	126.9%
Machine tools & metalworking	78.0%	76.6%	78.2%	70.6%	80.0%	86.2%	78.4%	87.1%	84.8%
Other industrial, ag & service	102.2%	107.6%	111.6%	98.0%	95.4%	102.9%	97.0%	89.3%	83.8%
Dollar Value	92.52	97.40	104.44	116.48	116.87	119.44	125.91	126.75	119.28

Sources: Federal Reserve Board and the U.S. Bureau of Economic Analysis.

## IMPORTS AND EXPORTS OF MACHINERY

The chart above shows that aggregate exports of machinery exceeded imports from 1995 until 2003.<sup>7</sup> Even then, exports of some types of machinery – oil drilling, mining, construction, industrial engines, pumps, and compressors – still surpassed the corresponding imports. The notable exception has been machine tools and metalworking machinery; exports of such have trailed imports throughout this time. Imports and exports of other industrial, agricultural and service machinery have fluctuated, with imports exceeding exports in more recent years.

The general increase in the value of the dollar may explain part of this shift: the higher value of the dollar means goods made in America are more expensive for foreigners to buy, while foreign-made goods become less expensive for Americans to buy. Although there may be a time lag, this relationship appears to be stronger in the case of industrial engines, pumps and compressors, but less pronounced with oil drilling, mining, construction, and other industrial, agricultural and service machinery. The higher value of the dollars appears to have no effect on imports and exports of machine tools and metalworking machinery.

The recent drop in the value of the dollar, which averaged 113.79 in 2004 (Federal Reserve Board, 2005), may presage decreasing imports and increasing exports of machinery, reversing a number of the trends discussed above. However, other factors may work against this. Some writers are concerned about the effect of China's rapid industrialization on America's manufacturing base. They believe that the large volume of low cost imports from China – including machinery – are reducing America's manufacturing base, and manufacturers in Ohio are no exception. One of the factors they cite is the under-valuation of the yuan, which abets the already low cost of Chinese labor (Business Week, 2004; Rulan, 2005). The yuan is more or less pegged to the value of the dollar (about 8.28::1), and has changed little since 1995 (Federal Reserve Board, 1999-2005).<sup>8</sup>

See Table A12