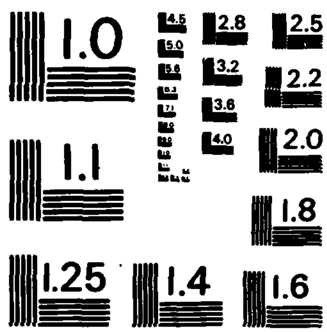
AD-A162 012 DEFENSE INDUSTRY PROFITS IN PERSPECTIVE(U) WATERVLIET ARSENAL NY R P DAVIS 20 SEP 85 1/1

UNCLASSIFIED F/G 5/3 NL

END
FILMED
DTIC


1.0
4.5
5.0
2.8
2.5
3.2
2.2
3.6
4.0
2.0
1.1
1.8
1.25
1.4
1.6

AD-A162 012

DTIC FILE COPY

Defense Industry Profits In Perspective

by

R. Preston Davis
Institute for Defense Analyses
1801 N. Beauregard St.
Alexandria, VA 22311

Presented at the
19th Annual Department of Defense
Cost Analysis Symposium
Xerox Training Center
Leesburg, Virginia
September 17 - 20 1985

Defense Industry Profits in Perspective

Defense industry profitability has been a topic of high interest in recent months. For example, Washington Post articles published periodically since last Spring have put forth the opinion that Defense industry profits are quite high with respect to other areas of American business. These articles speak of "record profits" [1] and profits that are "rarely matched in commercial business." [2] The paper ~~I am presenting today, though not truly rigorous,~~ casts serious doubt about the validity of such statements.

Before beginning though, it is worth noting that in June the Department of Defense (DoD) published the results of an eighteen month study comparing defense profits to the profits of durable goods manufactures. This study, titled "Defense Financial and Investment Review" [3], analyzed the years 1970 through 1983. One of its major conclusions, which casts doubt on the "higher-than-normal" profit theory, is quoted below:

"Economic profits of defense work were very similar to those of comparable durable goods manufacturers for the years 1970-1979. For the period 1980-1983, average defense profitability decreased slightly from the previous 10-year perod while that of durable goods manufacturers deteriorated dramatically. Defense industries were able to maintain their profitability primarily because of the increase in defense outlays and the decline in inflation."

Because the subject matter of the DoD report so closely matches my study, some comparisons of results will be made during the discussion.

[1] Washington Post 3/31/85 p. 12

[2] Washington Post 4/1/85 p. 6

[3] Defense Financial and Investment Review, June 1985; Government Printing Office 1985-527 896/30600

I have chosen to compare the defense industry with non-durable goods industries. This was done so as to have statistically independent values for comparison. The object of ~~my~~ study is to compare different segments of American business to see if one is more profitable than another. If the segments compared have a relationship to one another, i.e., covariance, then the results in one industry will influence the results in another. I chose the industries for comparison with an eye to minimizing any relationship between them. The industries chosen were: Drug, Newspaper, Cosmetics and Toiletries, Paper and Paper Products, and Food Processors. The Value Line investment service and corporate annual reports were used as the primary sources of financial information. The total period of time covered is from 1978 to estimates of 1985. Table 1 lists the companies included in the defense industry; Table 2 lists the companies included in each of the other industries.

Over the period covered, the following measures of effectiveness (MOE) were examined:

1) sales growth, measured as an index with 1978 = 100 [4]
2) operating margin, defined as operating income divided by sales [5]
3) return on assets, defined as operating income divided by total assets
4) net margin, defined as net income divided by sales
5) return on equity, defined as net income divided by total equity.

Although the study as defined above is useful for determining relative profitabilities, it contains a problem. The defense industry as defined in Table 1 performs a large amount of non-defense work. To really look at the "defense" industry we must have information concerning the impact of this non-defense work on overall profitability. This is not easy to do using publicly available information. However, it can be done over

4 Index = current year sales *100/base year sales

5 Operating income has been taken as stated by the data source; it is esssentially income before interest and taxes.

(5)	Boeing
(67)	E-Systems
(90)	Fairchild
(3)	General Dynamics
(6)	General Electric
(11)	Grumman
(10)	Litton
(4)	Lockheed
(12)	Martin Marietta
(1)	McDonnell Douglas
(26)	Northrop
(22)	RCA
(9)	Raytheon
(2)	Rockwell International
(31)	Tenneco
(8)	United Technologies

Note: Number in parentheses indicates rank of 1984 defense sales.

Table 1. Defense Industry Companies Included in Study

Drugs

American Home Products
Bristol-Myers
(Eli) Lilly
Merck
Schering-Plough
Smithkline Beckman
Squibb

Newspaper

Dow-Jones
Gannett
Knight-Rider
New York Times
Times Mirror
Washington Post

Cosmetics

Alberto-Culver
Avon
Chesebrough-Ponds
Gillette
Helene Curtis
Mary Kay
Revlon

Paper & Paper Products

Boise-Cascade
Crown Zellerbach
Federal Paper Board
Georgia Pacific
Hammermill
International Paper
Scott Paper
Union Camp

Food Processors

Beatrice
Borden
CPC International
Campbell Soup
Dart & Craft
General Mills
Heinz
Kellogg

Table 2. Non-Defense Companies Included in Study

shorter period of time and for a few MOE's. Using annual reports it is possible, for the years 1982 through 1984, to determine values for a nearly pure defense industry for sales growth, operating margin and return on assets. The results for these years may then be compared to the non-durable goods industries and to the non-defense portion of the defense companies.

On the assumption that there haven't been any fundamental changes in the relationship between results in the defense versus non-defense portions of the companies we can then make a judgment about the relationship of the entire company's profits over the entire period studied.

Some changes in definitions were required for this portion of the study and a problem with comparability of data was encountered.

The modified definitions are presented below; the comparability problem must be resolved through sensitivity analysis, which is presented with the modified definitions.

Sales growth [6]: same as for the general study except that 1982 = 100

Operating margin: same as for the general study

Return on assets: 1) for the defense industry, operating income from the defense business segments divided by operating assets employed by those business segments; i.e. total assets minus cash, goodwill, etc.

2) for the non-defense industries, operating income divided by total assets minus cash, but not goodwill, etc. This incompatibility will result in understating the return on assets for the non-defense corporations.

Figures 1 through 3 show the MOE's from the defense industry business components compared to non-defense industries for the years 1982 through 1984. Figure

6 There may be differences in how sales are defined, but such differences have been considered negligible for this study

1 shows the sales index for the period. Although this is a short period for showing sales growth, it is seen that there has been a healthy growth for the defense industry - to 135 in 1984. This is closely matched by the Newspaper industry (128) and Paper Products (122). It is more interesting to look at this parameter over a longer period - as will be shown in a later chart.

Figure 2, which shows operating margin, is much more startling. Every industry studied is more profitable than the defense industry when measured in terms of dollars of profit per dollar of sales. The defense profit rates shown here are quite close to those calculated in the DoD study, as shown in the table below.

Table 3. Operating Margin

	1982	
	DoD [7]	This Study
1982	8.0%	7.8%
1983	8.7%	8.8%

The DoD study had a larger sample size (n = 76) and its definition of profit results in a higher rate than the one used for this study.

Figure 3 shows return on assets (ROA), or dollars of profit per dollar invested in corporate assets. Because government furnished plant and equipment is commonly available to the defense industry for the conduct of its business, it would not be surprising to see ROA higher than for other industries. As shown, however, this isn't necessarily true. The Newspaper and Drug industries consistently outpace it and Food Processing is quite comparable. The DoD study results show higher ROA - indicating a lower asset base was used.

7 Defense Financial and Investment Review, p. v-30

Table 4. **Return on Assets**

	DoD [8]	This Study
1982	24.7%	17.4%
1983	27.7%	19.7%

The next three figures, Figures 4 through 6, show the comparison between the defense industry's defense and non-defense work. As seen, the non-defense business segments have much lower profit rates than the defense areas. Although not shown, comparisons of this non-defense business to the non-defense industries would be truly startling. Why the non-defense business segments of the defense industry are so much less profitable than non-defense industries is not a question which was considered in this study; however, the years 1982 - 1984 were a recessionary period for the United States economy - especially for durable goods manufacturers. For this study, the data are presented to point out that the effect of adding the data on non-defense business segments is to lower the overall profit rates - certainly for 1982 through 1984 and by presumption for the remaining years studied.

The last set of figures, Figures 6 through 11, show the results of the overall study, i.e. for all MOE's and for the entire period. After what has been learned to this point, there is nothing surprising about the results. The sales index of the defense industry has been consistently higher than the average of the non-defense industries although the Newspaper industry outpaces all the industries studied. Operating margin for the defense industry has remained in the ten percent range over the period studied, consistently outpaced by the Drug, Newspaper and Cosmetics industries and generally matched by the Paper Products and Food Processing industries. These same comments are true for net margin. Because of data limitations, return on assets could only be calculated for 1982 through 1984. This figure is very similar to Figure 3 except that the defense industry now

[8] Ibid, p. v-32

includes both defense and non-defense results. In return on equity, the defense industry is again consistently outpaced by the Drugs, Newspapers and Cosmetics industries, closely tracked by Food Processors and trailed only by the Paper Products industry.

As we have seen, it is evidently not true that Defense industry profits are "rarely matched in commercial business" and, if the profits are "record", they are only so with respect to prior years in the defense industry; they appear low with respect to other industries. In short, the current adverse publicity concerning Defense industry profits does not seem to be borne out, by either this short study or the more expansive DoD study released in June.

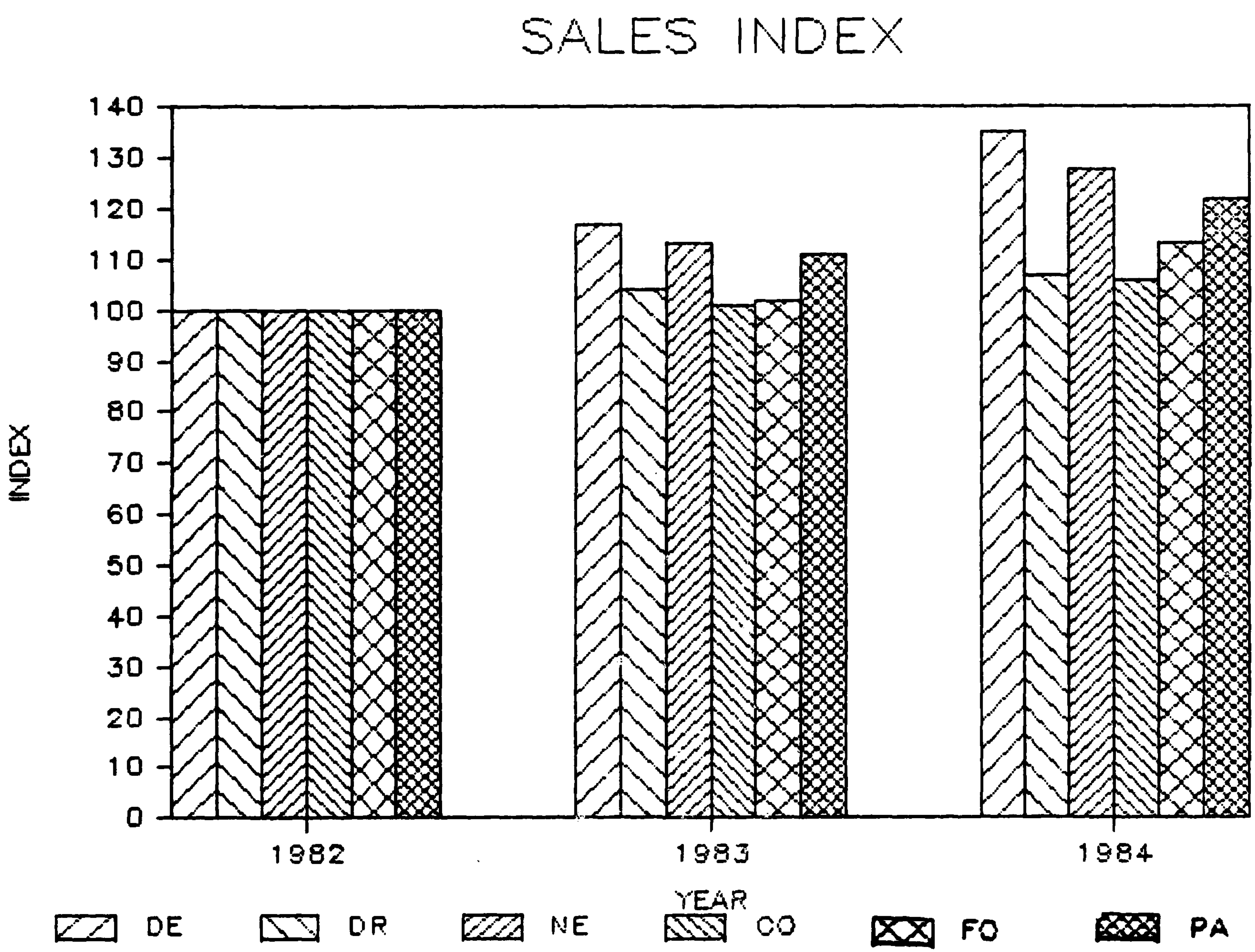


Figure 1: Sales Index, Defense vs. Non-Durable Goods

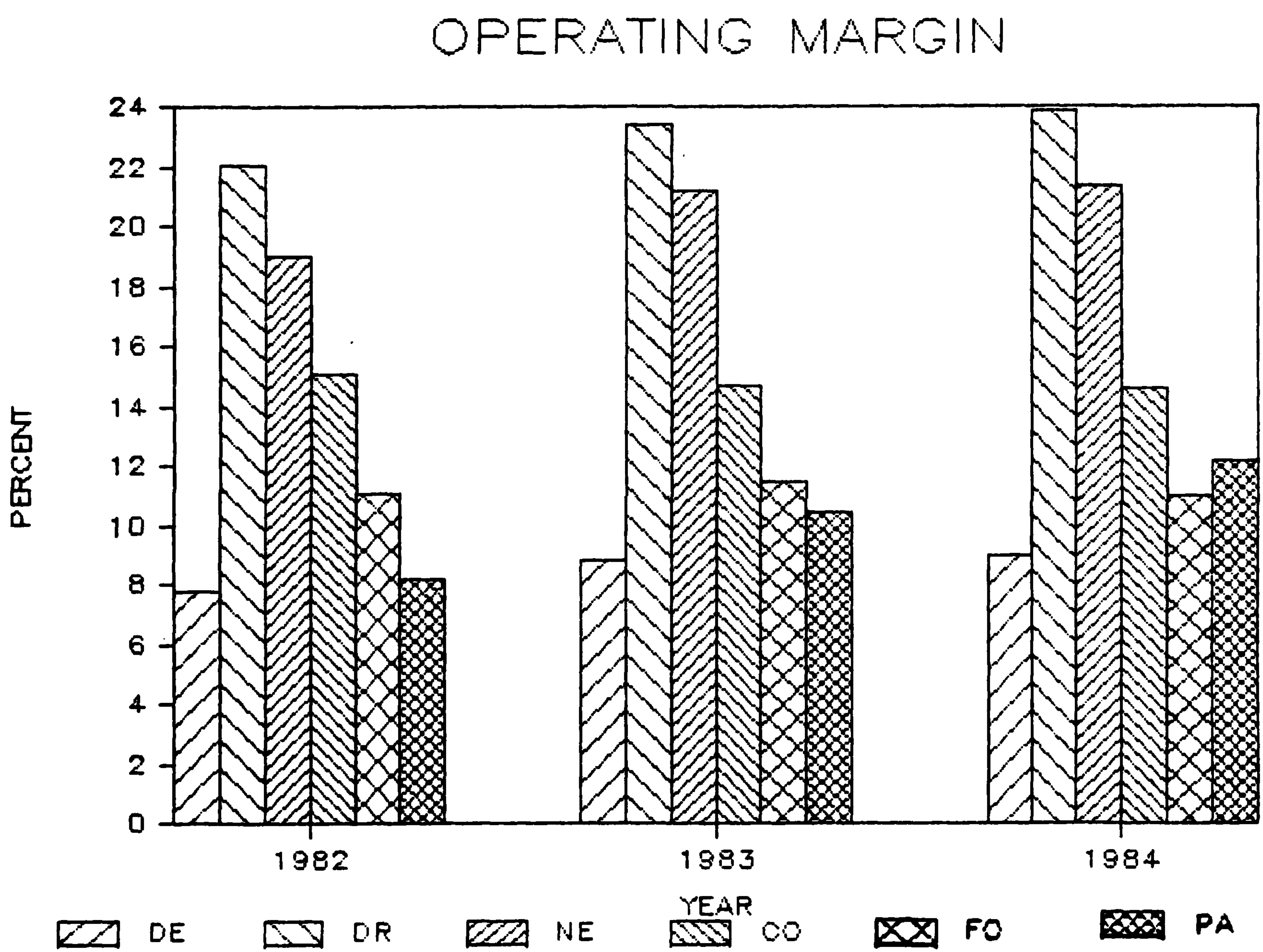


Figure 2: Operating Margin, Defense vs. Non-Durable Goods

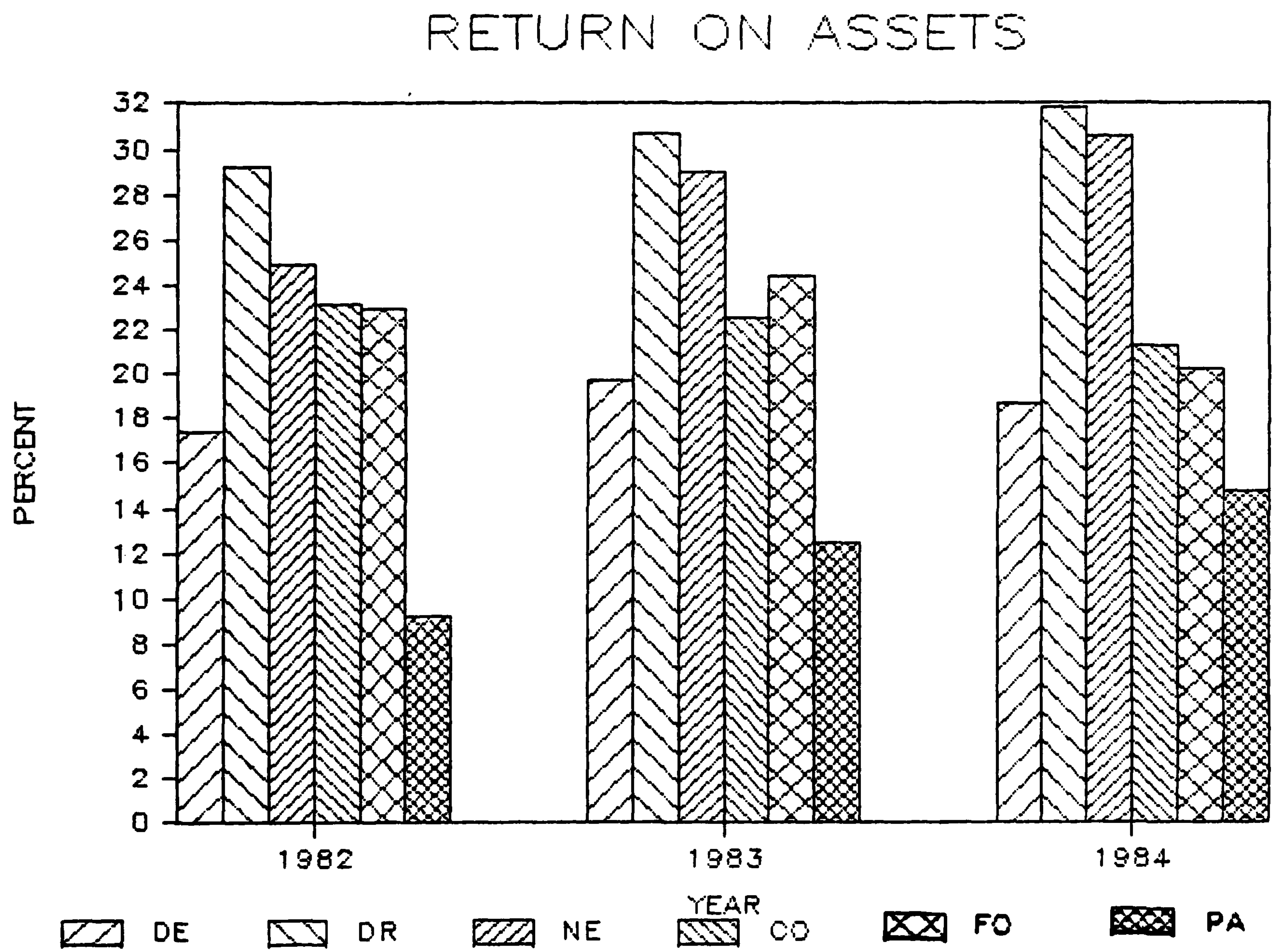


Figure 3: Return on Assets, Defense vs. Non-Durable Goods

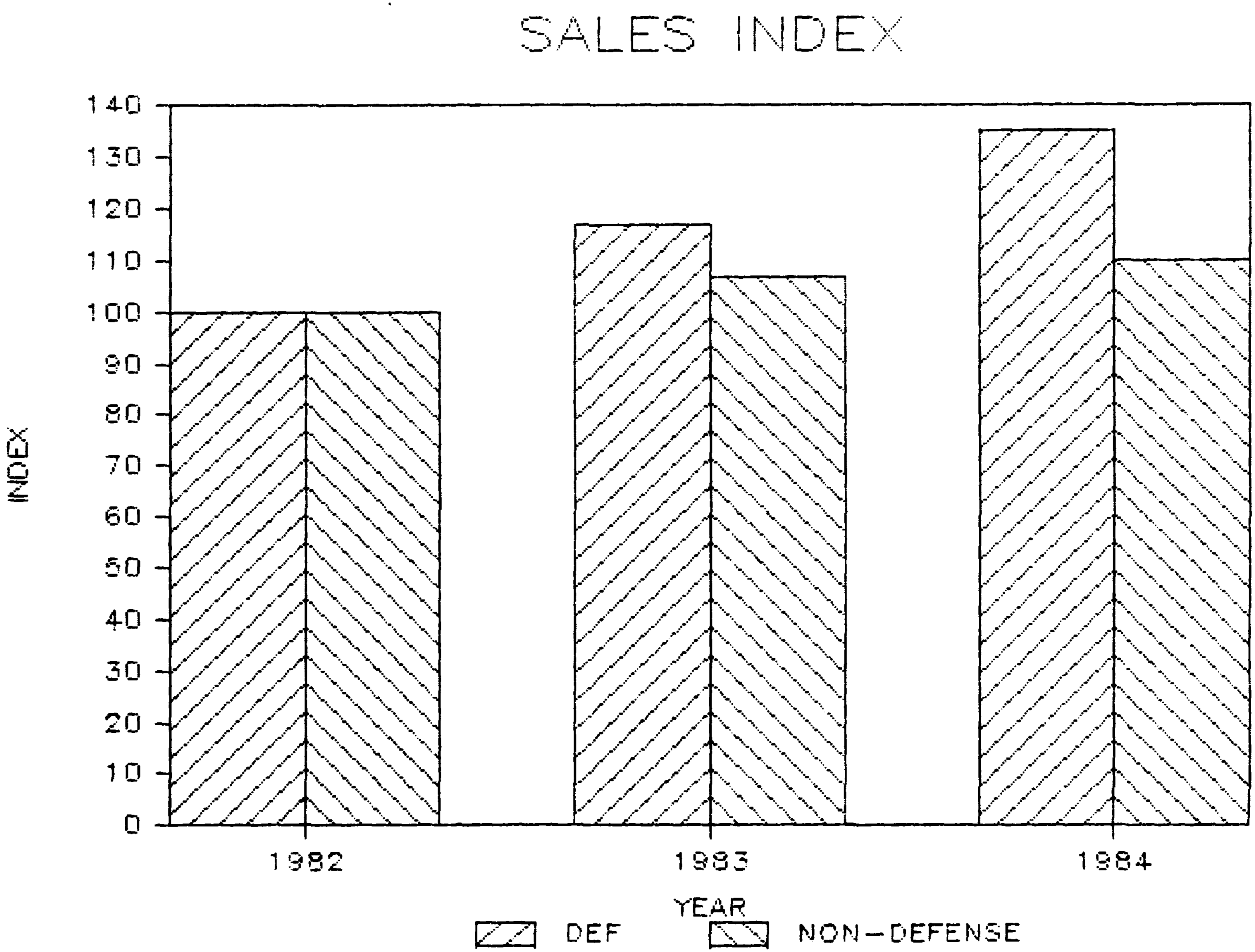


Figure 4: Sales Index, Defense vs. Non-Defense

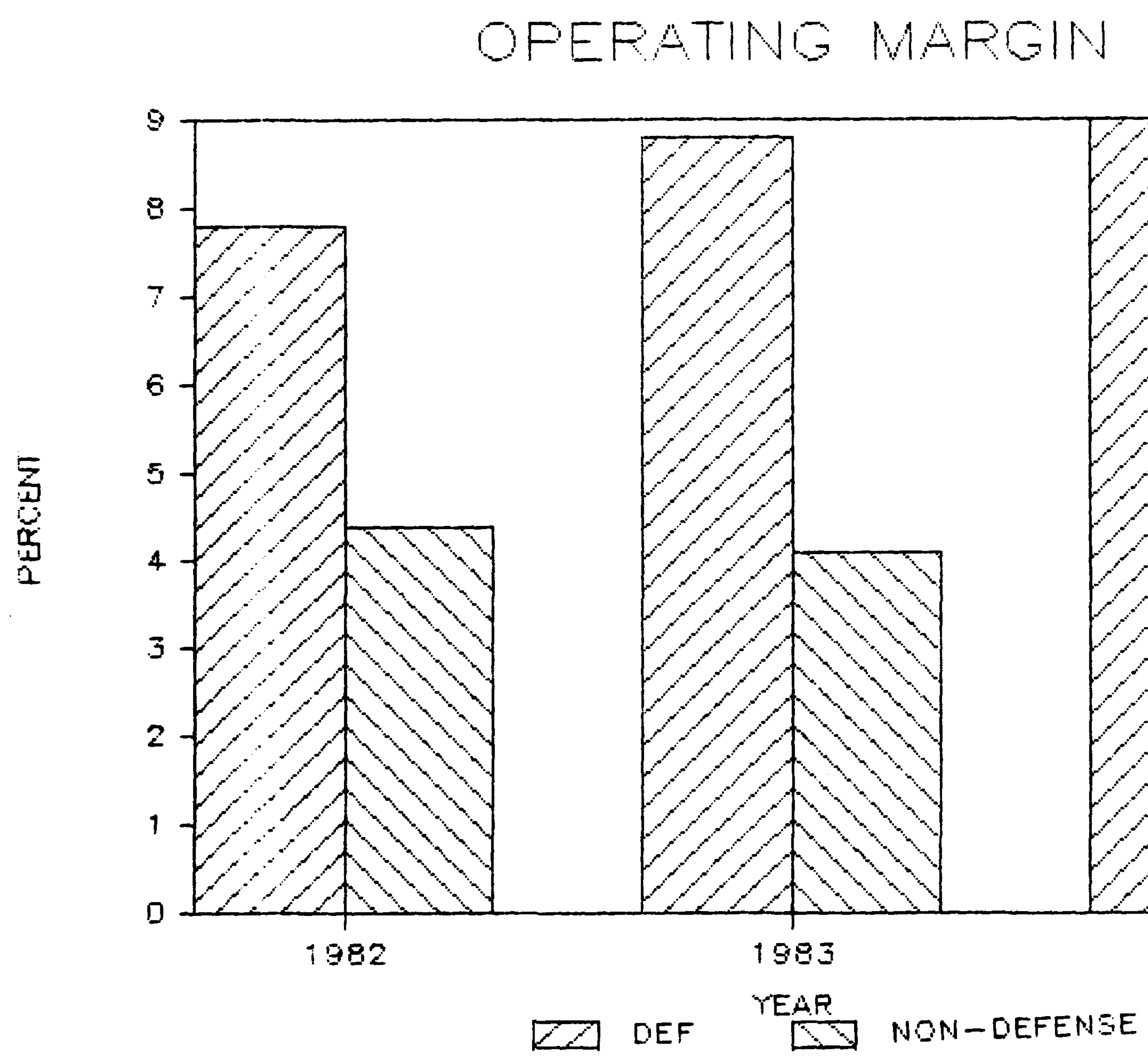


Figure 5: Operating Margin, Defense vs. Non-Defense

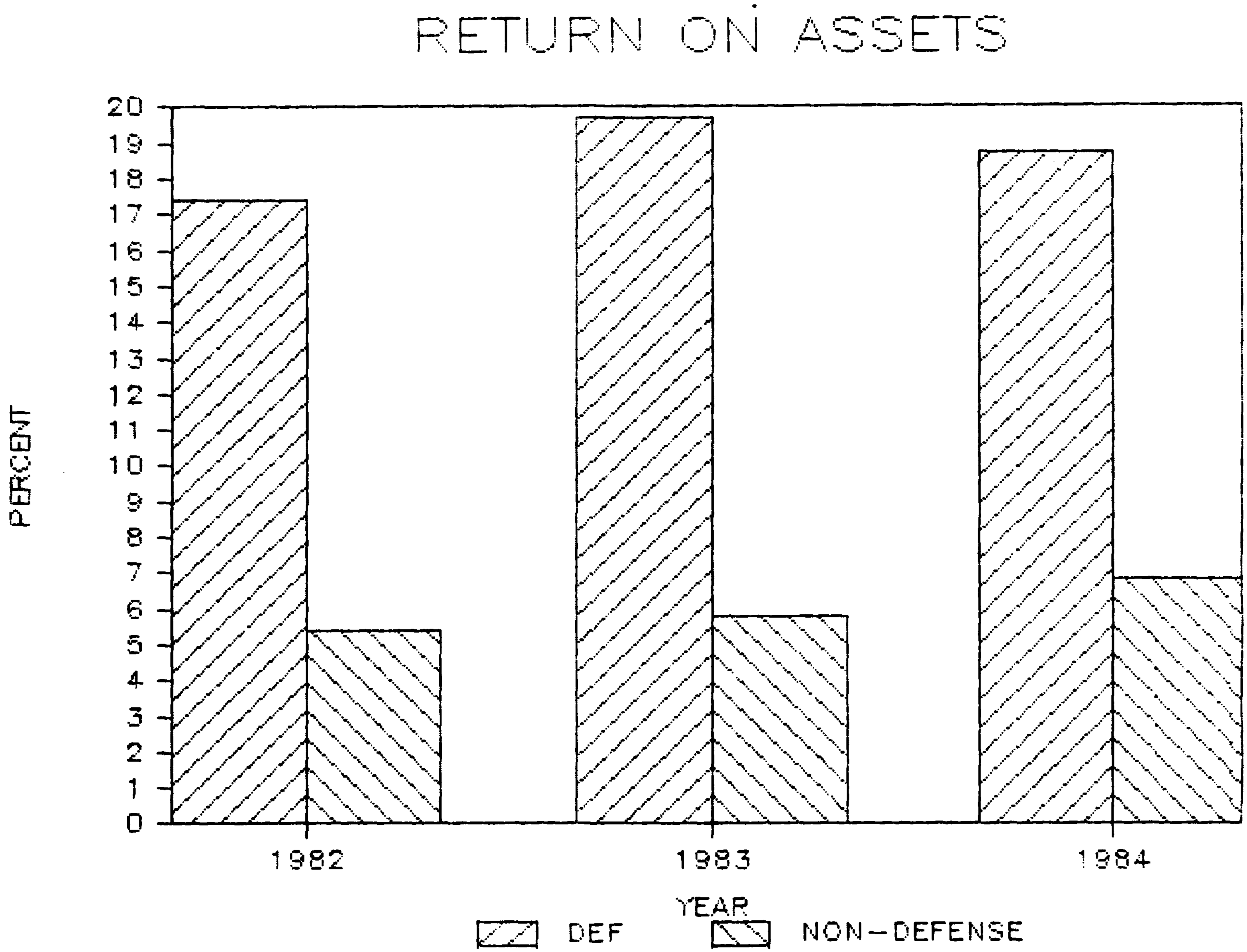


Figure 6: Return on Assets, Defense vs. Non-Defense

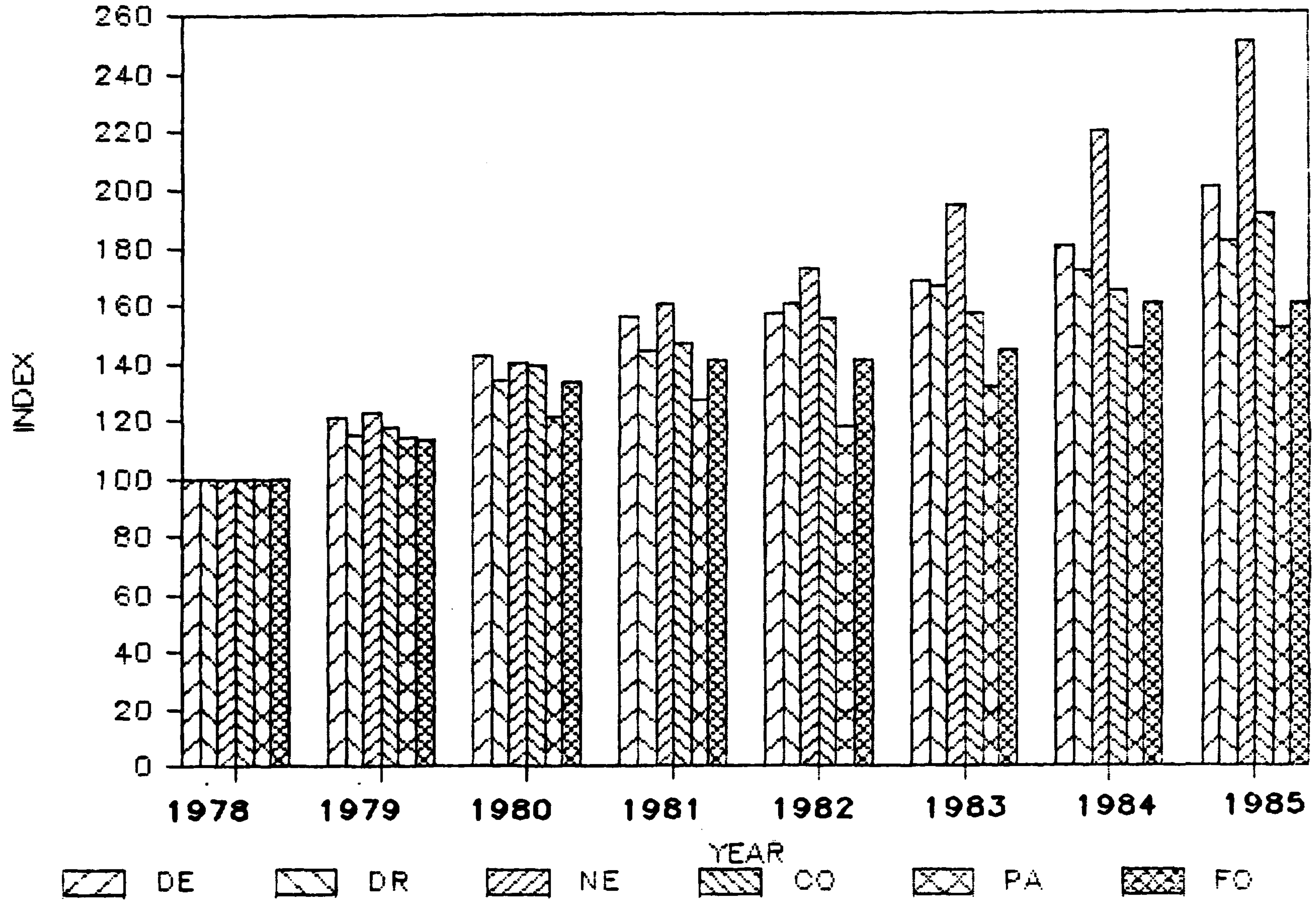


Figure 7: Sales Index, All Industries

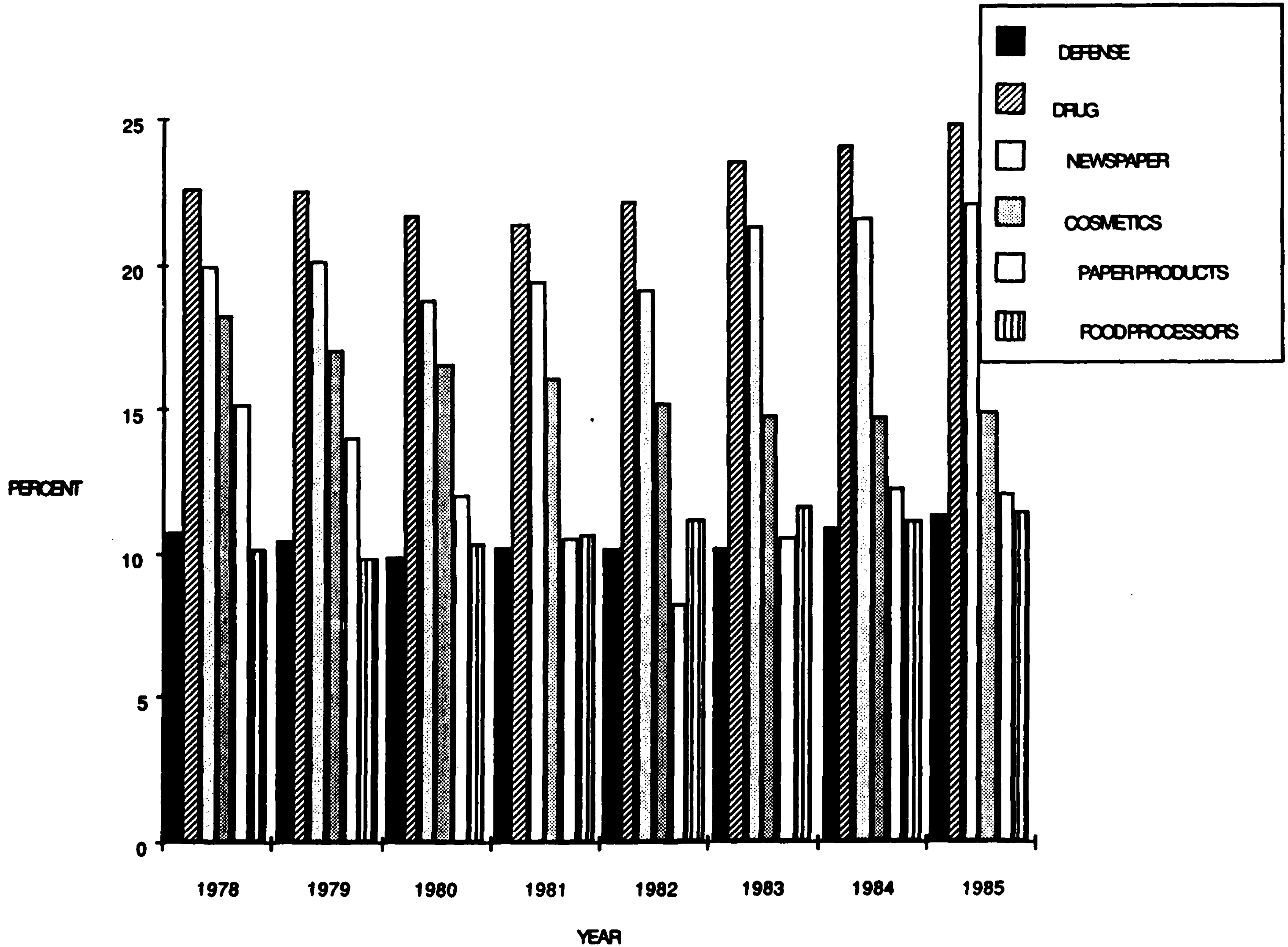


Figure 8: Operating Margin, all Industries

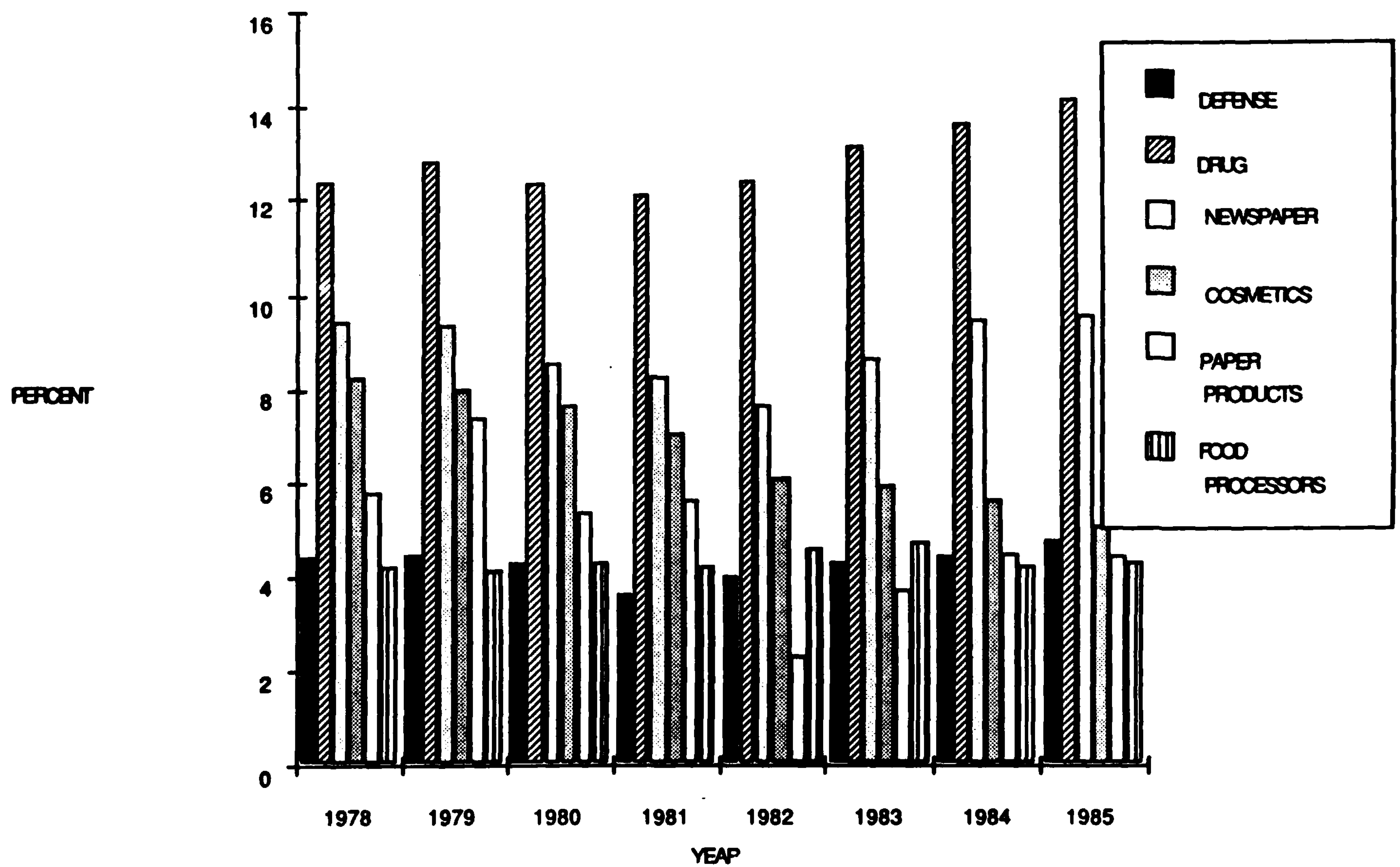


Figure 9: Net Margin, All Industries

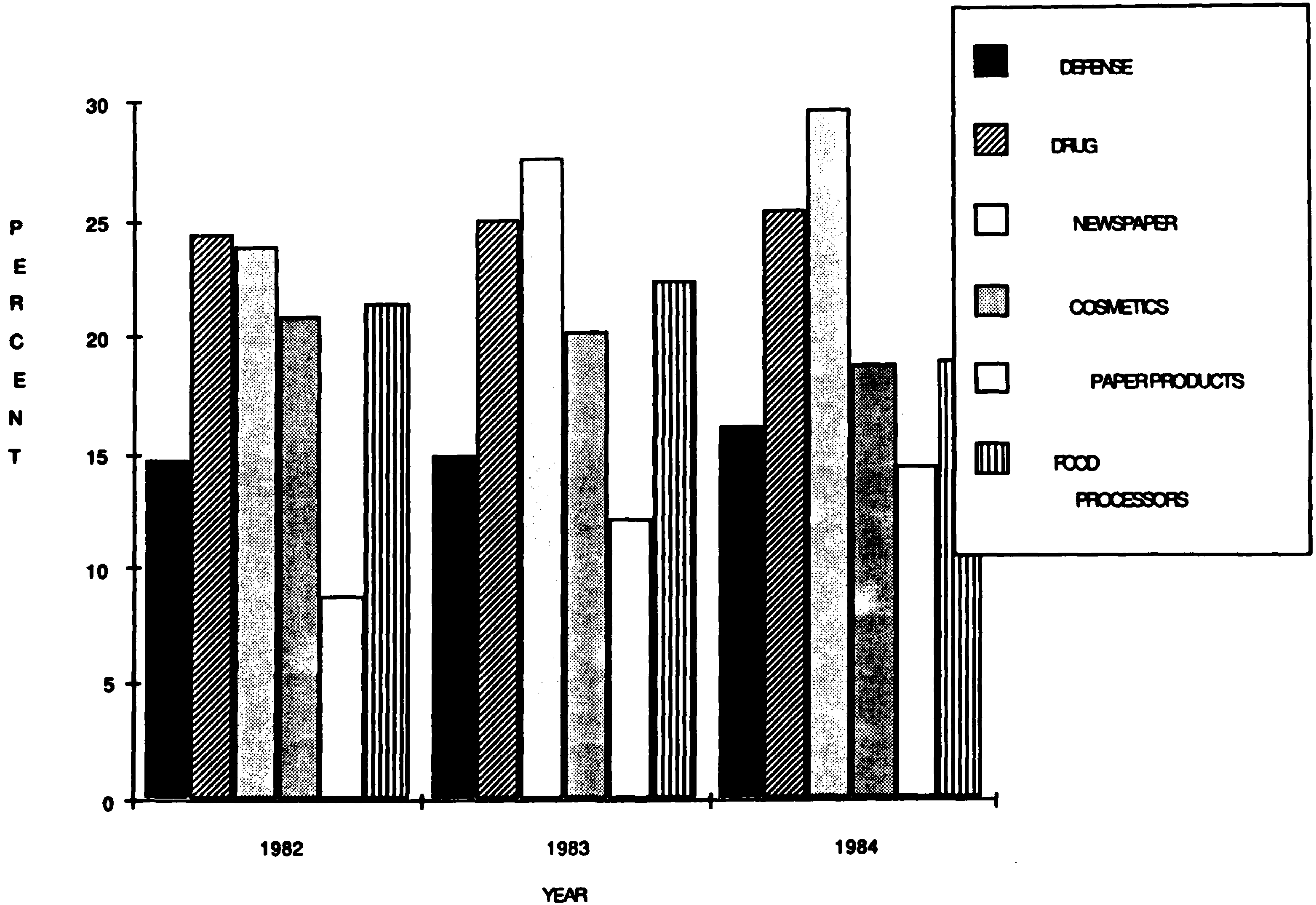


Figure 10: Return on Assets, All Industries

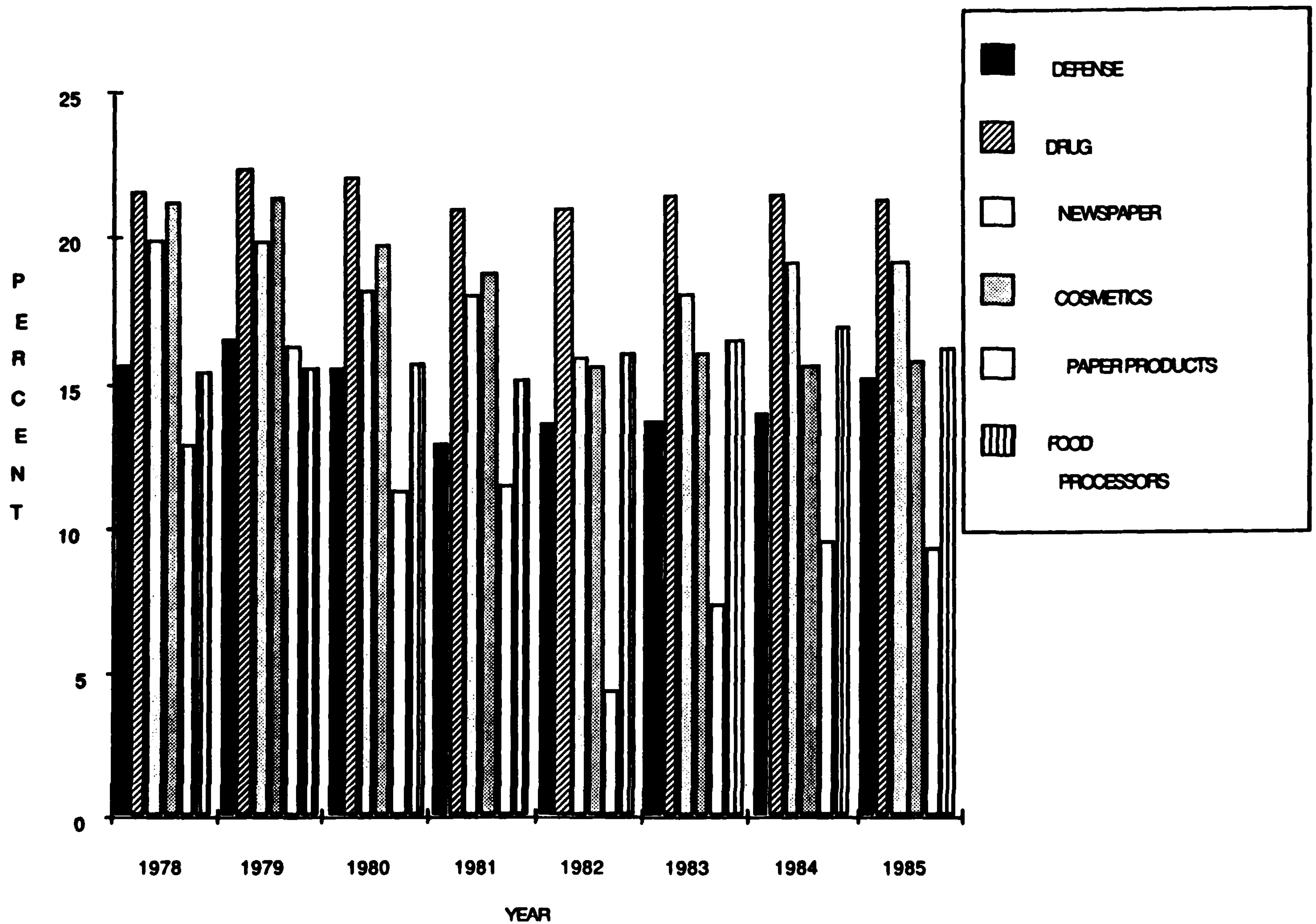


Figure 11: Return on Equity, all Industries

END

FILMED

1-86

DTIC