The Effect of The Tax Reform Act of 1986 on Economic Efficiency

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Abstract

The Federal income tax law was dramatically changed by the Tax Reform Act of 1986. The purpose of this study is to determine if the TRA reduced the variability of corporate effective tax rates and in turn improved economic efficiency. To determine if variability has been reduced, corporate effective tax rates were measured for 1985 and 1987. The variance of the effective tax rates was computed and tested to determine if the variability was reduced.

Introduction

The Staff of the Joint Committee on Taxation (1986) depicted the Tax Reform Act of 1986 (TRA) as one of the most comprehensive revisions of the Federal income tax system ever enacted. The staff report cited three major Congressional objectives of the TRA simplicity, equity, and efficiency. This research focuses on the later objective, the development of a more efficient tax system.

Prior to the TRA, Congress regularly introduced economic incentives into the Internal Revenue Code despite the inefficient decisions, labor distribution, and consumption choices that these incentives engendered. For example, accelerated depreciation methods contributed to the excessive construction of office buildings and, as a consequence, record vacancy rates. Moreover, special write-off procedures for farming activities led to an excessive investment in agricultural tax shelters by high-income investors who have little familiarity with farming. As these economic incentives have accumulated in our tax system, the efficiency of the U.S. economy as a whole suffered from the resulting misallocation of resources. Congress sought to rectify some of these costly economic disturbances as part of the TRA.

For many years, reformers had proposed lower rates as a means of increasing the efficiency of the tax system. Due to political constraints that required the TRA to be revenue neutral, Congress was compelled to expand the income tax base in 1986 as well. To reduce rates and at the same time maintain revenue neutrality, Congress curtailed and eliminated several key deductions and credits. Deductions that remained in the tax system became less valuable to taxpayers because of the reduced rates. The anticipated effect of these changes was that future decisions would more likely be based on economic factors rather than on tax law inducements.

Some of the key changes that were expected to implement the efficiency objective included a reduction in the maximum corporate tax rate from 46% under the old law to 34% under the TRA and the elimination of the investment tax credit (ITC). Further, the corporate alternative minimum tax (AMT) was made more restrictive. Congress designed the post-1986 AMT to assure that the effective tax rate paid by a corporate taxpayer comes closer to the top statutory rate under the TRA. By reducing the maximum regular tax rate to 34% and by raising the AMT rate to 21%, the effective tax rates of all firms, in theory, should be brought closer together.

This study measures the effective tax rates of corporate taxpayers before and after the enactment date of the TRA to determine whether it has improved economic efficiency. Previous studies have demonstrated that significant variances in tax rates among firms, industries, or assets creates a distortion in the resource allocation that causes the overall economic system to be inefficient (Bradford, 1980; Gravelle, 1981; Harberger, 1980). A Pareto optimal solution is reached only when all firms have the same average effective tax rate. Even if a Pareto optimal solution is not realized, this study should provide evidence on whether the TRA increased the efficiency in our tax system. If the variance of effective tax rates is smaller after the TRA, an inference can be drawn that the new law has increased the overall efficiency of our economy.

The purpose of this study is to examine the change in tax rate variability and to determine how this variability differs by industry. The results suggest that the variance of corporate income tax rates has been reduced. If Congress intends to pursue its efficiency objective, this study also indicates which industries should be the focus of future reform.

Prior Research

Several studies have analyzed the impact of economic inefficiencies created by our tax system. Each study is consistent in its finding that tax incentives have introduced significant inefficiencies to the U.S. economy over a number of years. While many of the tax inducements have accomplished their immediate goals, the welfare costs attributable to the inefficiencies exist nonetheless.

In his seminal study, Harberger (1966) demonstrated the process by which inefficiencies occur when two industries are taxed at different rates. The resulting shift in capital investment from the industry subject to the higher rate to the second industry is an inefficient allocation motivated entirely by tax differences. In comparison, when the two industries are equal (i.e., at the Pareto optimal solution), the overall return was shown to be higher. Thus, the misallocation of resources involves a social welfare cost. Harberger's measure of welfare costs suggests that capital stock in the U.S. corporate sector was reduced between one- sixth and one-third as a result of differences in effective tax rates during the period studied.

The Internal Revenue Code includes many provisions that encourage personal housing and the real estate industry. Rosen (1979) and Slemrod (1982) have examined the impact of such tax incentives on the housing industry and the associated welfare costs. Each study analyzed the misallocation of capital from non- residential investment to residential investment that was caused by income tax incentives such as the deductions for mortgage interest and property taxes, the exemption or deferral of the gain on the sale of residential property, and the exemption of imputed rents on owner-occupied housing. Both studies concluded that a significant shift in capital occurred due to these tax incentives.

Gravelle (1981) examined the deadweight loss caused by differences in the effective tax rates applicable to 22 categories of equipment and eight categories of non-residential structures. A deadweight loss is the difference between the optimum income and the actual income generated following a shift in resources. Her examination revealed a deadweight loss of $2.5 billion in 1978, which at a pre-tax real rate of return of 8.2% is equivalent to wasting capital of $30.5 billion.

Hendershott and Hu (1986) measured the net cost of capital for six groups of investments for 1964-1965 and 1976-1977. Their results suggested that the net cost of capital was lowest for the housing sector since implicit rent is exempt from income taxation. Also, the net cost of capital was highest in the corporate sector because corporate income is taxed at two levels. Further, the net cost of capital was found to be lower for equipment than for structures since the latter were ineligible for the ITC. These differences in capital costs resulted in a

misallocation of resources to those segments with the lower costs. The authors estimated that elimination of the disparity would increase the return on capital by approximately $142 billion (in 1978 dollars).

Over the past two decades, a great deal of attention has been devoted to the computation of effective tax rates. Economists, financial analysts, political lobbyists, and accountants use different measures. The effective tax rate formula varies according to the informational needs of the user. Fullerton (1984 and 1986) has surveyed the literature and summarized the historical development of the effective tax rate measures. In addition, he has constructed a taxonomy of effective tax rates and discussed the uses and limitations of the measure.

Several researchers have utilized an average effective tax rate in their studies (e.g., see Sunley, 1976; Siegfried, 1974; Joint Committee on Taxation, 1983; and Stickney, 1980). This measure is easy to calculate, and the data are readily available. On the other hand, the marginal effective tax rate has been the measure used in much recent research (see Fullerton, 1984 and 1986). These rates are most appropriate when the effect of specific components are at issue, such as depreciation rates or the ITC. Provisions such as the AMT and the uniform cost capitalization rules normally are not considered. Since this study is concerned with the overall impact of the TRA, the measure employed is one based on average effective tax rates.

The Data

The data were drawn from the COMPUSTAT data base for the years 1985 and 1987. These years were selected as the pre-TRA and post-TRA periods, respectively. The year 1986 was not selected because of the various effective dates that pertain to the major provisions of the TRA. For example, ITC was repealed for most property placed in service after December 31, 1985, depreciation rules were changed for property placed in service after December 31, 1986, and the reduced corporate tax rates did not go into effect until July 1, 1987. Using 1987 data in lieu of 1988 data affects only the difference in overall rates. This difference in statutory rates affects the average effective tax rates of all corporations and introduces an overall conservative bias. Because the reduced tax rates for 1987 were blended on a monthly basis, fiscal year corporations are excluded from consideration to prevent a wide range of statutory tax rates from polluting the data. The maximum statutory rate for calendar year-end corporations was 40% in 1987 and 34% in 1988. Therefore, only corporations with calendar year ends and a maximum marginal statutory rate of 40% are used.

Similarly, firms with net income before taxes less than $1,405,000 were excluded from the study. This is the

income level for the taxable year 1985 at which a firm forfeits all the benefits of the graduated rates. This procedure limits the sample to companies that would have computed their Federal corporate income tax at a flat rate of 46% in 1985 (if taxable income equalled or exceeded book income before taxes). At this income level, the statutory tax rate is 40% in 1987. Also, this procedure eliminates all firms with net operating losses.

The purpose of screening the data by taxable year and income level is to obtain a sample with the same expected statutory tax rate. After screening the data, 1,015 firms remained from 1985 and 1,111 firms remained from 1987.

In measuring average effective tax rates, a critical decision on the inclusion or exclusion of deferred taxes had to be made. The issue concerning deferred taxes is probably the most controversial topic in the development of a methodology for measuring effective tax rates (Starcher, 1982). The consequence of including deferred taxes is to examine only how the permanent tax differences affect effective tax rates among firms or industries. But the TRA made substantial changes to both temporary and permanent differences. Temporary differences are affected by changes in depreciation rates, uniform cost capitalization rules, and LIFO inventory methods. Permanent differences are affected by the rate reduction, the ITC repeal, and the AMT modifications. To include deferred taxes ignores a significant portion (i.e., the temporary differences) of the new tax law. On the other hand, if deferred taxes are added back, the computation ignores events that occurred in the current year.

Because the data are readily available, they were analyzed twice, once measuring effective tax rates including deferred taxes and once measuring effective tax rates excluding deferred taxes. The formulas used are presented in Table 1. As noted later, the results were consistent whether deferred taxes are included or excluded.

TABLE 1
Measurement of Average Effective Tax Rate

Excluding Deferred Taxes:

$$\text{Average Effective Tax Rate} = \frac{\text{Income Taxes Total} - \text{Deferred Income Taxes}}{\text{Pretax Income}}$$

Including Deferred Taxes:

$$\text{Average Effective Tax Rate} = \frac{\text{Income Taxes Total}}{\text{Pretax Income}}$$

Before analysis of the data, the corporations meeting the criteria above were sorted by effective tax rates. A few of these firms exhibited extremely high or extremely low rates, which appeared to be caused by unique

financial accounting situations that are unlikely to recur. For example, the 1985 annual report for Dow Chemical discloses a special charge against income of $592 million. The special charge included $471 million for "asset-related write-offs and write-downs" and $121 million for "personnel-related costs." The special charge was the result of reducing excess capacity. During the same period, Dow Chemical invested $806 million in new plant properties. The result of these two transactions was to reduce income before taxes to $30 million and to produce a negative provision for income taxes of $28 million, which included $155 million of current taxes and a negative $183 million of deferred taxes. Dow Chemical had an effective tax rate including deferred taxes of -93.3% and an effective tax rate excluding deferred taxes of 516.7%. These rates are not representative of other firms or other years for Dow Chemical.

To increase the interpretability of the data, all firms with effective tax rates over 100% or under -50% were removed from the sample. This removal of outliers resulted in 922 firms in the 1985 sample and 1,094 firms in the 1987 sample when deferred taxes were excluded. The sample sizes for 1985 and 1987 were reduced to 998 and 1,098, respectively, when deferred taxes were included.

Analysis of Effective Tax Rates

To determine the impact of the TRA on economic efficiency, we analyzed the variance of effective tax rates for the sample corporations in 1985 and in 1987. A reduction in the variance would suggest an improvement in economic efficiency. Succinctly, our research question was: Has the variance of corporate effective tax rates declined from 1985 to 1987?

Analysis of Individual Firms

The mean and variance of effective tax rates were computed and are presented in Table 2 for two groups of firms. Along with the sample discussed above, the 100 firms with the largest book income before taxes were examined to assure that any change in variance for them is approximately the same as it is for the sample. The largest 100 firms make up a substantial portion of overall economic activity. Nonetheless, each firm is ascribed equal weight in this study. So if the impact of the TRA is in the opposite direction on these 100 firms relative to the balance of the sample firms, any aggregate change in variance might not be a reliable indicator of the overall impact on economic efficiency.

Examination of the change in variances, however, indicated that the changes from 1985 to 1987 were in the same direction and approximately the same for the 100 largest firms as they were for the sample firms. Excluding deferred taxes, the variance declined by .0021 [.0339 -

TABLE 2
The Overall Means and Variances of Effective Tax Rates

	Total Firms	Top 100 Firms
Excluding Deferred Taxes:		
1985		
Mean	25.1%	29.6%
Variance	.0369	.0339
1987		
Mean	29.4%	29.4%
Variance	.0349	.0318
Including Deferred Taxes:		
1985		
Mean	34.8%	41.3%
Variance	.0260	.0134
1987		
Mean	34.7%	36.2%
Variance	.0208	.0117

.0318] for the largest firms and declined by .0200 [.0369 - .0349] for the sample firms. These represented percentage declines of 6.19% and 5.42% respectively. When deferred taxes are included in the measure, the variance declined by .0017 [.0134 - .0117] for the largest firms and declined by .0052 [.0260 - .0208] for the sample firms. These represented percentage declines of 12.69% and 20.00%, respectively.

Utilization of the F test assumes that the effective tax rates in the sample are normally distributed. To test this presupposition, four chi-square goodness of fit tests were performed. Two tests were performed on the data for both 1985 and 1987, one including and one excluding deferred taxes.

For the measure that includes deferred taxes, the chi-square tests for 1985 and 1987 yielded test statistics of 35.0 and 14.8, respectively. These statistics are significant (p < .01) and, therefore, it cannot be concluded that the distribution of effective tax rates including deferred taxes is normally distributed. Therefore, the Moses nonparametric test was used to test variability. The test statistic of 2.44 was significant (p < .01), indicating that the variance of effective tax rates when deferred taxes are included declined after the TRA.

When deferred taxes were excluded, the chi-square tests for 1985 and 1987 resulted in statistics of 4.6 and 4.0, neither of which is significant. Thus, there is support for the use of the F test. The F test ratio of the variances when deferred taxes are excluded is 1.0573 [i.e., .0369/.0349], which is significant (p< .01). Therefore, we conclude that the variance of effective tax rates when deferred taxes are excluded was reduced also after the TRA.

Classification by Industry Groups

To determine the impact of the TRA on specific industries, the sample firms were classified into industry groups. COMPUSTAT assigns all companies a four-digit S&P Industry Index Relative code. These 132 groups were condensed into 30 groups by combining similar groups. The mean of the effective tax rates for each industry group has been computed for 1985 and 1987. For
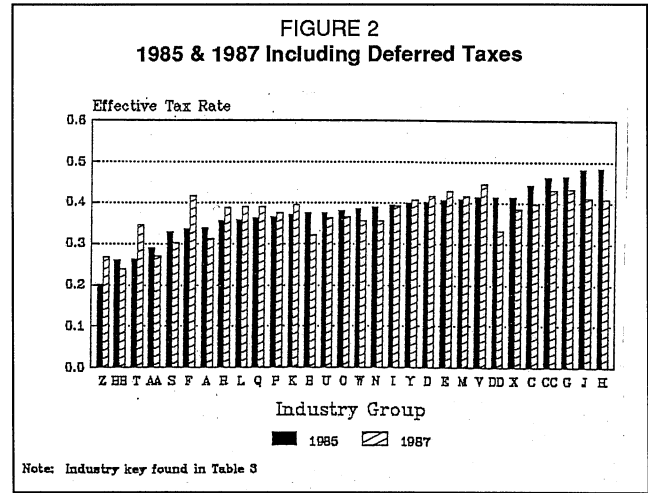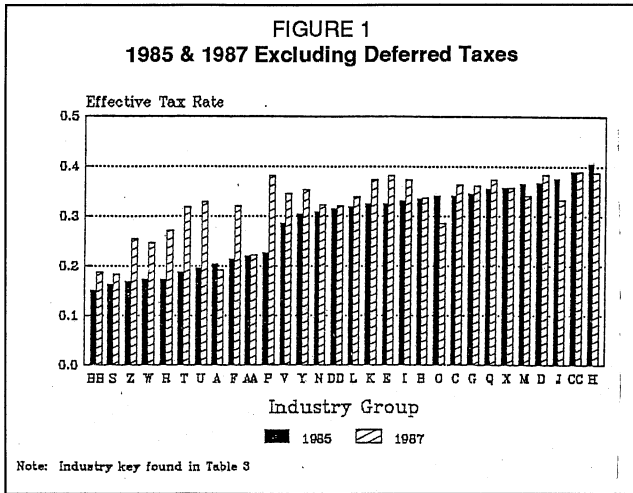
TABLE 3
Industry Group Effective Tax Rate – Means

	Industry Description	EXCLUDING DEFERRED TAXES 1985	1987	INCLUDING DEFERRED TAXES 1985	1987
A	Metals – Mining	20.4%	19.3%	33.9%	31.1%
B	Oil & Gas Exploration	33.5%	33.6%	37.5%	32.0%
C	Food & Beverage	34.2%	36.3%	44.3%	39.7%
D	Tobacco	36.7%	38.3%	40.1%	41.6%
E	Textile	32.4%	38.1%	40.6%	42.9%
F	Forest & Paper Products	21.4%	32.0%	33.7%	41.6%
G	Publishing	34.6%	36.2%	46.6%	43.3%
H	Commercial Printing	40.7%	38.7%	48.5%	41.0%
I	Chemicals, Drugs & Cosm	33.1%	37.4%	39.4%	39.3%
J	Oil Integrated	37.6%	33.3%	48.2%	41.2%
K	Tire & Rubber Products	32.4%	37.4%	37.1%	39.5%
L	Metals – Manufacturing	31.9%	33.9%	35.8%	38.9%
M	Computer & Business Eqmt	36.6%	34.1%	40.9%	41.7%
N	Electronics	30.9%	32.3%	38.9%	35.5%
O	Automotive	34.1%	28.5%	38.1%	36.6%
P	Aerospace/Defense	22.7%	38.1%	36.6%	37.5%
Q	Toys & Leisure	35.5%	37.3%	36.2%	38.9%
R	Railroads	17.3%	27.1%	35.6%	38.8%
S	Truckers	16.4%	18.4%	32.9%	30.2%
T	Air Transport	18.9%	31.9%	26.3%	34.5%
U	Telephone	19.7%	32.8%	37.5%	36.2%
V	Broadcast Media	28.5%	34.6%	41.4%	44.5%
W	Utilities (Elect & Gas)	17.3%	24.8%	38.6%	35.6%
X	Wholesalers	35.8%	35.8%	41.5%	38.4%
Y	Retail Stores	30.5%	35.3%	40.0%	40.7%
Z	Financial Institutions	16.9%	25.5%	20.2%	26.7%
AA	Personal Loans	22.0%	22.3%	29.0%	27.1%
BB	Insurance & Brokerage Firm	15.1%	18.9%	26.1%	23.9%
CC	Insurance Agents	38.9%	39.0%	46.2%	43.2%
DD	Homebuilders	31.4%	32.0%	41.5%	33.2%
	Average	28.6%	32.1%	37.8%	37.2%
	Variance	.0062	.0037	.0040	.0027

each group, the measure was computed excluding and including deferred taxes, and are presented in Table 3.

The difference in the mean of the total sample and the mean of the industry groups' means can be explained by the varying size of the industry groups. The decrease in the variance of the effective tax rates for the industry groups is noteworthy. The variance excluding deferred taxes fell from .0062 to .0037, a reduction of 40.3%. The ratio of the variances excluding deferred taxes is 1.6756, which is significant (p < .10). The variance including deferred taxes, on the other hand, declined from .0040 to .0027, a reduction of 32.5%. The ratio of the variances including deferred taxes is 1.4815, which is not significant. Thus, there is only marginal support for contending that the variability of effective tax rates for industry groups declined after the TRA.

Figure 1 graphically portrays the industry groups sorted by their 1985 effective tax rates (excluding deferred taxes) accom- panied by their 1987 effective tax rates. With few exceptions, industries paying the lowest tax rates in 1985 were paying considerably higher rates in 1987. The four industry groups that continue to pay low rates are the trucking industry, the metals-mining industry, insurance and brokerage firms, and personal loan firms. Although not as pronounced, a similar result appears in Figure 2, where deferred taxes are included. Most noticeably, the seven industries that paid the highest effective tax rate in 1985 (including deferred taxes) all paid lower rates in 1987. Both figures seem to suggest a reduction in the variability, although the statistical test provided only modest support for the hypothesis that the variance of effective tax rates has declined since the TRA.

FIGURE 1
1985 & 1987 Excluding Deferred Taxes

Effective Tax Rate

Industry Group

■ 1985   ▨ 1987

Note: Industry key found in Table 3

FIGURE 2
1985 & 1987 Including Deferred Taxes

Effective Tax Rate

Industry Group

■ 1985   ▨ 1987

Note: Industry key found in Table 3

Figures 3 and 4 suggest an interesting corollary. Figure 3 illustrates the 1985 effective tax rates by industry group both including and excluding deferred taxes. Figure 4 graphically depicts the same comparison of rates for 1987. A comparison of the figures suggests that the gap between effective tax rates including and excluding deferred taxes has been dramatically reduced since enactment of the TRA. The narrowing of this gap is particularly apparent among those industry groups paying the lowest rates. This observation indicates that the numbers used to compute income taxes for financial accounting and tax accounting purposes have become more uniform despite the fact that the methods used to compute those numbers appear to be moving further apart. The changes in the AMT may be responsible for this effect.

The results of the industry classification provide marginal support for the research question. The TRA appears to brought the effective tax rates of industry groups closer together.
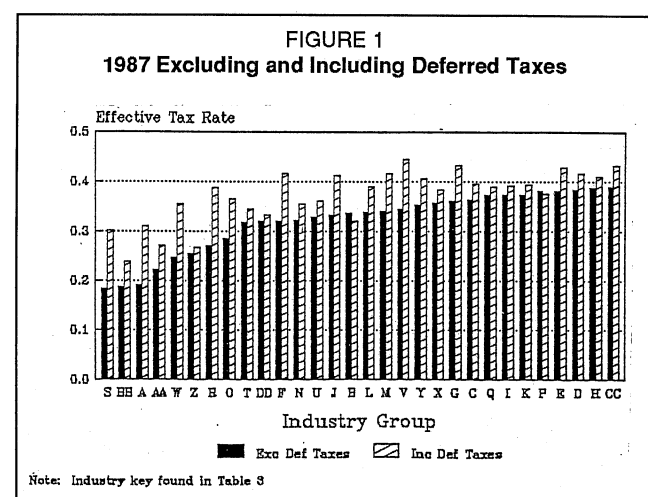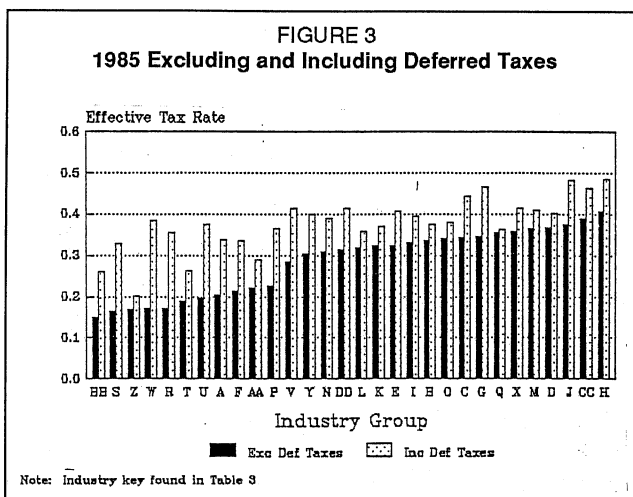
Limitations and Assumptions

Inferences drawn from this study are subject to two timing limitations. First, the effective dates of the TRA provisions were not uniform. As noted earlier, the ITC was retroactively repealed effective December 31, 1985, while depreciation rules were modified at the end of 1986. The 12 month phase-in of corporate tax rates began on July 1, 1987. Because of the various effective dates, the full impact of the TRA on effective tax rates did not occur at one point in time.

Second, the full impact of the TRA requires time for the market forces to react and for the shift in resources to occur. Although a lack of statistical significance does not necessarily mean that the TRA did not improve efficiency (type II error), a significant reduction in the variance of the firms' effective tax rates may not result in an immediate improvement in efficiency.

These limitations are accompanied by certain assumptions. First, the measure of effective tax rates in this study included Federal, state and foreign taxes. Since the purpose was to determine whether the TRA increased economic efficiency, it must be assumed that changes in

FIGURE 3
1985 Excluding and Including Deferred Taxes

Effective Tax Rate

Industry Group

■ Exc Def Taxes   ▨ Inc Def Taxes

Note: Industry key found in Table 3

FIGURE 1
1987 Excluding and Including Deferred Taxes

Effective Tax Rate

Industry Group

■ Exc Def Taxes   ▨ Inc Def Taxes

Note: Industry key found in Table 3

foreign or state taxation were not responsible for any decrease in variability. Since state tax rates (six to ten percent) are small relative to the federal rates, any change in state taxation from 1985 to 1987 is thought to have a nominal impact on overall effective tax rates. Alternatively, it is assumed that any changes in foreign or state taxation were in response to, not independent of, the TRA. There is some support for the validity of this latter assumption. Ernst & Whinney (1988) reported that many foreign countries were reducing their tax rates in direct response to lower U.S. rates in the TRA.

Summary and Conclusions

When analyzed on an individual firm basis, we found that the variability of corporate effective tax rates declined following the TRA. Only modest support was found for our hypothesis that effective tax rates were reduced when the data were analyzed by industry group. However, a visual depiction of changes in effective tax rates by industry exhibited a noticeable reduction in differences from 1985 to 1987, particularly for those industries subject to tax rates at the upper and lower ends of the scale.

We conclude that there is strong to moderate evidence that the variability of effective tax rates was reduced by the TRA. Any decline was due primarily to the reduction in the statutory rates, the repeal of the ITC, and the more stringent AMT. We also conclude that additional efficiencies can be achieved by future reform that reduces the variability of effective tax rates even further. Our results suggest that at least four industry groups continue to pay effective tax rates lower than most other industries—metals mining, truckers, personal loans, and insurance and brokerage companies. Analysis of data from several years may indicate that these industries should be the focus of future reform.   ﹖

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