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# The Tax Treatment of Interest and the Operations of U.S. Multinationals

Kenneth A. Froot and James R. Hines, Jr.

## 9.1 Introduction

The taxation of multinational corporations entails a number of complications beyond those that accompany ordinary business taxation. One of the most complex and important aspects of taxing multinational firms is the treatment of interest expenses. Multinational firms may borrow money in one country in order to deploy the funds elsewhere. Firms are entitled to claim tax deductions for their interest costs, but the countries in which they borrow may not permit all of the associated interest expenses to be deducted against local income for tax purposes. The method used to calculate allowable interest tax deductions can, in turn, affect financing choices and operating decisions.

American tax law permits only partial deductibility of the interest expenses of multinational firms. U.S. law specifies rules that determine the extent to which interest costs incurred by multinational firms in the United States can be deducted for tax purposes against U.S. income. These rules are often changed, the last major change occurring in 1986.

This paper describes the impact on firm behavior of the change in the U.S. interest allocation rules introduced by the Tax Reform Act of 1986. The act significantly reduced the tax deductibility of the U.S. interest expenses of certain American multinational corporations. Congress changed the law in 1986

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because it was concerned that U.S.-based firms received tax deductions for interest expenses on borrowing undertaken in the United States to enhance their profits overseas. The act introduced a new formula for multinational firms to use in calculating the fraction of their interest expenses that can be deducted against taxable income in the United States.

This tax change increased the tax liabilities of certain American multinationals, and made additional borrowing more expensive for these firms. One of the concerns raised during the deliberations over the act was that this additional cost of borrowing might discourage some firms from investing in new plant and equipment, since a sizable fraction of new investment is financed by borrowing. The object of this paper is to examine the impact of the tax change on the operations of those multinational firms that were affected by the change in interest allocation rules. To do so, it is necessary to compare the behavior of the affected firms to the behavior of those firms that were unaffected by the interest allocation provisions of the 1986 act.

The results indicate that the change in interest allocation rules significantly influenced the operations of American multinational firms. Firms that were unable to deduct all of their interest expenses against their U.S. tax liabilities issued 4.2 percent less debt between 1986 and 1991 (measured as a fraction of total firm assets), and invested 3.5 percent less in property, plant, and equipment, than did other firms. In addition, the affected firms showed a greater proclivity to lease rather than own capital assets, and to reduce the scope of their foreign operations. All of these behavioral responses are consistent with the incentives created by the interest allocation provisions of the Tax Reform Act of 1986.

Section 9.2 describes the U.S. tax treatment of the interest expenses of multinational corporations, and analyzes the incentives created by the Tax Reform Act of 1986. Section 9.3 describes the data used to analyze the impact of the 1986 tax change, and presents the results of regressions that estimate the impact of the tax change on various aspects of the operations of American multinational firms. Section 9.4 is the conclusion.

## **9.2 The Tax Treatment of Interest Expense**

This section identifies the incentives created by the Tax Reform Act of 1986, in order to facilitate the analysis of the impact of the act on the behavior of U.S. firms.

Interest expenses are generally deductible against the taxable income of U.S. corporations. There are, however, two important circumstances in which the deductibility of interest is of limited value to an interest-paying corporation. The first arises when a corporation has negative profits before interest deductions. Since a firm with losses pays no taxes, interest deductions do not reduce its tax liability. Corporations are permitted, however, to carry net op-

erating losses backward up to three years or forward up to fifteen years.<sup>1</sup> The second circumstance is one in which a firm is subject to the corporate alternative minimum tax (AMT); firms paying the AMT face idiosyncratic tax incentives.<sup>2</sup>

### 9.2.1 Foreign and Domestic Allocation of Interest Deductions

Special problems arise in allocating the interest deductions of multinational firms. The idea that underlies U.S. law is that, when a multinational firm incurs interest expense in the United States, a certain fraction of the expense should be allocated as a deduction against taxable domestic income, and the remainder allocated against the firm's foreign income. The respective fractions are determined on the basis of the income-generating capacity created by the loans on which interest is paid. The extreme difficulty that this concept encounters is that it is not always clear to what extent a particular loan generates domestic-source and foreign-source income.

In order to understand the significance of the sourcing of interest deductions, it is necessary to consider the treatment of foreign-source income. The appendix to this volume describes the U.S. tax treatment of income earned by multinational corporations. Due to some peculiarities of the changes in U.S. tax law after 1986, certain firms found that the cost of debt changed significantly between 1986 and 1987. The goal of the empirical work described in section 9.3 is to follow and compare the behavior of those firms facing higher costs of debt to those firms facing unchanged cost of debt.

### 9.2.2 Interaction of Interest Expense and Foreign Income Rules

American firms with foreign income are generally not permitted to deduct all of their interest costs in the United States against their domestic taxable incomes. Instead, the law provides for various methods of allocating interest expenses between domestic and foreign income. The intent of the law is to retain the full deductibility of interest expense against taxable U.S. income, but only for that part of interest expense generating income that is subject to U.S. taxation.

From the standpoint of taxpaying firms, the U.S. tax law's distinction between domestic and foreign interest deductions is potentially quite important. If interest expense is deemed to be domestic, then it is deductible against the taxpayer's U.S. taxable income. If it is deemed to be foreign, then the interest expense reduces foreign taxable income *for the purposes of U.S. income tax-*

1. Tax-loss carryforwards do not accrue interest, a feature that limits their value even to firms that expect to have taxable profits in the future. Scholes and Wolfson (1992) analyze the value of tax-loss carryforwards in uncertain environments.

2. For the remainder of the paper, we analyze taxpaying firms that are not subject to the AMT. Lyon and Silverstein (1995) report that 30.7 percent of firms with assets over \$500 million paid the AMT in 1990.

tion only. Foreign governments do not use U.S. methods of calculating interest deductions and generally do not permit U.S. firms to reduce their taxable incomes in foreign countries on the basis of interest expenses incurred in the United States. Consequently, interest expenses allocated against foreign income are valuable to a U.S. firm only if it has deficit foreign tax credits. If it does have deficit credits, then some of the firm's foreign income is subject to U.S. tax, and any additional dollar of interest expense allocated against foreign income reduces the firm's U.S. taxable income by a dollar.<sup>3</sup> With deficit foreign tax credits, firms are indifferent between allocating interest expenses against foreign income and allocating them against domestic income.<sup>4</sup> If, on the other hand, firms have excess foreign tax credits, then any interest expenses allocated against foreign income are useless from the standpoint of reducing tax liabilities, since foreign income generates no U.S. tax liability anyway.

The Tax Reform Act of 1986 significantly changed U.S. tax law governing the allocation of interest expenses. Prior to 1986, the interest expenses of U.S. taxpayers were determined separately for each company within a controlled group.<sup>5</sup> In principle, each company was required to allocate interest deductions between domestic and foreign source in proportion to domestic and foreign assets.<sup>6</sup> In practice, however, this rule permitted taxpayers to structure their finances in order to obtain a full tax deduction in the United States for interest expenses associated with borrowing done in the United States.

Consider, for example, the situation of an American corporation that borrows \$100 in the United States, paying interest of \$10 annually. The corporation has \$150 of U.S. assets and \$50 of foreign assets, and earns profits of

3. Curiously, the law is written so that the additional dollar of interest expense reduces taxable income without reducing the foreign tax credits available for foreign income taxes paid.

4. This statement, along with much of the analysis described in the paper, abstracts from the ability of firms to carry excess foreign tax credits backward two years and forward five years. Firms that carry excess credits forward or back may (depending on specific circumstances) face incentives that are intermediate between those of deficit credit and excess credit firms.

5. Separate allocation of interest deductions for each company within a controlled group was firmly established by Treasury Regulation section 1.861-8, issued in 1977. Prior to 1977, U.S. law was somewhat vague about whether all of the companies within a controlled group should be consolidated for purposes of interest allocation, though in an important case based on pre-1977 law (*ITT v. United States*), the courts held that interest should be allocated on a consolidated basis.

6. Taxpayers were given the alternative of allocating interest deductions on the basis of gross domestic income and gross foreign income, though it is hard to understand why a tax-minimizing corporation would do so, since tax-planning opportunities are so attractive using the asset method on a single-company basis. The regulation provides that, if the income method is chosen, interest deductions allocated against foreign-source income cannot be less than 50 percent of the amount that would have been allocated against foreign-source income by the asset method. Taxpayers allocating their interest deductions on the basis of domestic and foreign assets were required to do so based on the book values of those assets, unless the taxpayer elected to allocate on the basis of fair market values, and could demonstrate fair market values to the satisfaction of the IRS. Once chosen, taxpayers were required to continue to use the fair market value method until granted permission by the IRS to discontinue its use. Book values of stock (such as parent corporation's stock in its foreign subsidiaries) were not adjusted to include undistributed earnings and profits reinvested by the subsidiary corporations.

\$15, gross of interest costs, in the United States, and profits of \$5 abroad. The corporation does no foreign borrowing. Under pre-1986 law, this corporation would be entitled to deduct only \$7.50 (75 percent of \$10) of its interest charges against U.S. income, since only 75 percent of its assets produce U.S.-source income; the remaining \$2.50 of interest deductions would be allocated against foreign-source income. The same firm, with the same real business activities, could, however, reorganize its affairs in a manner that would permit all of the \$10 interest cost to be deductible against U.S. income. To do so, the parent firm need only borrow the \$100 in the U.S. market and then contribute the money as paid-in capital to a wholly owned domestic subsidiary that owns the firm's domestic and foreign operations. The domestic subsidiary pays all of its profits to its parent as dividends. The parent firm and the domestic subsidiary file a consolidated tax return and annual report. The domestic subsidiary has \$15 of U.S.-source income and \$5 of foreign-source income; it has no interest expenses. The parent firm has \$20 of income on the basis of dividends received from its subsidiary, and \$10 of interest deductions. The parent firm is entitled to deduct all of its interest expense against U.S. income, since the firm's assets (its wholly owned subsidiary) are all in the United States.<sup>7</sup>

The Tax Reform Act of 1986 significantly changed the method by which interest deductions are allocated, specifically by introducing a "one-taxpayer rule" in which the attributes of all members of a controlled group—whether owned directly by a parent firm or owned by the parent through one or more subsidiaries—determine the allocation of interest deductions between domestic and foreign income.<sup>8</sup> The motivation for the tax change was the insight that financial fungibility implies that borrowing by one part of a controlled group directly or indirectly influences the economic activities of all of the group. The act provides that the interest expenses of a U.S. taxpayer should be allocated between domestic-source and foreign-source income based on the relative assets of the domestic and foreign operations of the controlled group. Of course, several complications attend the implementation of such a rule.

Taxpayers are required to allocate interest deductions between domestic and foreign source on the basis of the book values of assets held domestically and abroad.<sup>9</sup> In the cases of subsidiaries that are 10 percent or more owned by members of the affiliated group, the book values of stock held in the sub-

7. Prior to 1986, U.S. law did not use sophisticated "look-through" rules to determine the extent to which a U.S. corporation represents a U.S. asset. Instead, a U.S.-located subsidiary was considered to be a U.S. asset as long as 20 percent or more of its gross income for the prior three years had U.S. source. In the example, 75 percent of the domestic subsidiary's gross income has U.S. source.

8. The changes in the interest allocation rules introduced by the Tax Reform Act of 1986 were phased in over three years. Various phase-in rules apply to the interest on debt issued between 1983 and 1985.

9. Taxpayers have the alternative of using the fair market values of assets held domestically and abroad, but if taxpayers do so, they are not again able to use book values without permission of the IRS.

subsidiaries are adjusted to reflect accumulated earnings and profits of the subsidiaries. Hence, in the case of an American firm that initially finances its wholly owned French subsidiary with \$100 of equity, and in which the subsidiary subsequently earns and reinvests an additional \$400, the parent's book value of the subsidiary is adjusted to \$500 for purposes of interest expense allocation.

The 1986 act provides for a curious treatment of foreign assets and foreign interest deductions by members of a controlled group. For this purpose, the gross value of U.S. assets and the net value of foreign assets are used. This leads to a somewhat asymmetric treatment of foreign and domestic borrowing for purposes of interest expense allocation. Consider, for example, the case of a U.S. firm that has \$200 of U.S. assets, of which \$150 is equity and \$50 is debt borrowed from an unrelated party; the firm also has \$200 of foreign assets, of which \$150 is parent equity and \$50 is debt borrowed by the subsidiary from an unrelated foreign party. The firm has U.S.-source gross income of \$40, U.S. interest cost of \$5, foreign-source gross income of \$40, and foreign-source interest expense of \$5. This firm is required to allocate almost half of its \$5 domestic interest deduction against foreign-source income,<sup>10</sup> and the firm is not permitted to allocate any of its foreign interest expense against domestic-source income, even though the leverage situation of the foreign subsidiary is the same as the leverage situation of its American parent.

One of the consequences of the asymmetric treatment of U.S. parent firms and their foreign subsidiaries is that the tax law can encourage firms to finance their subsidiaries with debt from the American parent instead of parent equity or unrelated-party debt. Parent equity in foreign subsidiaries reduces the amount of domestic interest payments allocated against U.S.-source income. If, in the previous example, the subsidiary borrowed \$50 from its parent company instead of from an unrelated party, and the parent financed the loan to its subsidiary by borrowing an additional \$50 from unrelated U.S. parties, then the subsidiary's tax position would not change (it still gets a \$5 deduction against taxable income in the foreign country for interest paid to its U.S. parent),<sup>11</sup> but the parent firm would receive a larger interest deduction against U.S.-source income. The U.S. Treasury issued regulations designed to prevent U.S. firms from reacting to the passage of the 1986 act by financing their foreign subsidiaries with loans from U.S. parents financed by U.S. borrowing.<sup>12</sup>

10. The firm has domestic assets of \$200 and foreign book assets of \$150, so it allocates four-sevenths ( $\$200/\$350$ ) of its domestic interest expense against domestic-source income, and the remaining three-sevenths against foreign-source income.

11. Subject to two qualifications. Certain countries (including the United States) impose "thin-capitalization" laws that limit the amount of related-party interest foreign firms can deduct from local taxable income. In addition, countries often impose withholding taxes on cross-border interest payments; U.S. firms with deficit foreign tax credits receive foreign tax credits for paying these taxes. Withholding taxes on interest are usually reduced, often to zero, by bilateral tax treaties.

12. Details of these regulations are described in Froot and Hines 1995.

### 9.2.3 Incentives Created by the Tax Rules

The upshot of the rules just described is that firms with excess foreign tax credits and substantial foreign assets (as a fraction of total assets) could no longer enjoy the benefits of full deductibility of interest expenses incurred in the United States after 1986. Firms with deficit foreign tax credits, or those with no foreign assets, retain full benefits of interest expense deductibility. As a consequence, firms in the first category can be expected to reduce their borrowing relative to firms in the second, and can also be expected to reduce the volume of their debt-financed investment activity.<sup>13</sup>

## 9.3 Data and Results

This section describes the data used to analyze firm reactions to the Tax Reform Act of 1986. The section presents the details of the procedure used to construct our sample of firms and some statistics that describe aspects of the behavior of these firms after 1986.

### 9.3.1 The Sample

We use information reported by Compustat on the balance-sheet items of large publicly traded corporations. Compustat currently provides information on more than 7,500 companies. We select only multinational firms incorporated in the United States: firms are included if their reported foreign assets equal 1 percent or more of reported total assets for *each* year during 1986–90. Four hundred twenty-two firms satisfy this criterion.

Foreign tax rate information is central to our analysis, since the hypothesis that firms maximize after-tax profits implies that deficit foreign tax credit firms will react quite differently to the Tax Reform Act of 1986 than will excess foreign tax credit firms. We construct foreign tax rates as the ratio of foreign income taxes paid to foreign pretax income as reported by Compustat. This variable is somewhat noisy, but is likely to capture the major differences between the foreign tax rates facing different firms.<sup>14</sup> In order to attenuate some

13. Two other studies examine the impact of interest allocation rules on the behavior of impacted firms. Collins and Shackelford (1992) find that firms with large ratios of foreign to domestic assets are more likely than other firms to issue preferred stock (as a substitute for debt) in the period after 1986. Collins and Shackelford do not, however, distinguish excess foreign tax credit firms from deficit foreign tax credit firms. Altshuler and Mintz (1994) analyze the borrowing patterns of a sample of eight multinational firms, finding that firms that are unable to claim full tax deductions for interest payments in the United States are more likely to borrow abroad than to borrow in the United States.

14. The introduction of the new interest allocation rules in 1986, along with other tax changes, gave some firms incentives to adjust the location and tax-avoiding behavior of their foreign affiliates. In the analysis that follows, we take foreign tax rates to be exogenous to U.S. tax changes. Endogenizing foreign tax rates could change the interpretation of the magnitude of the estimated effects.

of the difficulties that accompany annual measurements of the foreign tax rate variable, firms are classified into excess foreign tax credit status based on five years of data, 1986–90. Firms for which the average foreign tax rate over that period exceeds the contemporaneous average U.S. statutory corporate tax rate are classified as excess foreign tax credit firms; all other firms are classified as deficit foreign tax credit firms.<sup>15</sup> From our initial sample of 422 firms, six additional firms are excluded, five due to insufficient tax rate information, and one to major ownership changes over the 1986–91 period.

Firms that merge or acquire new firms may face dramatic changes in their tax business environments that have the potential to confound the analysis of their tax-motivated behavior. In some of the statistical work that follows, we exclude firms that show changes in total assets of 100 percent or more in single years, doing so with the idea of excluding firms involved in major mergers or acquisitions. This restriction reduces the sample size to 388 firms. Froot and Hines 1995 provides additional description of the sample of its construction.

We measure changes in debt as the difference between total debt (long-term and current) in 1991 and total debt in 1986. Changes in capital are measured as the difference between net property, plant, and equipment in 1991 and that in 1986. Foreign assets are measured as total foreign assets in 1986, and the ratio of this variable to total assets in 1986 is used not only to control for firm characteristics (degree of multinationality) but as part of the cost of debt finance after 1986.<sup>16</sup>

### 9.3.2 Behavior of the Sample

Table 9.1 describes the behavior of our sample of firms after 1986. Firms are classified into two groups on the basis of fraction of foreign assets (above median and below median); within group, they are further classified by excess foreign tax credit and deficit foreign tax credit status. Roughly half of the firms in the sample (51.4 percent) are classified as having excess foreign tax credits.

Firms that differ in the fraction of their assets held abroad are likely to differ in other important observable and unobservable ways. The after-tax cost of debt-financed investments rose most sharply after 1986 for firms with excess foreign tax credits and significant foreign assets. The behavior described in table 9.1 is consistent with predicted patterns. Firms with excess foreign tax credits exhibit slower mean growth (from 1986 to 1991) of outstanding debt

15. This classification of the foreign tax credit status of the firms in the sample is necessarily somewhat imprecise. The same firm may have excess foreign tax credits in one year and deficit foreign tax credits in another; furthermore, excess foreign tax credits may be carried forward five years or back two years. A firm's foreign tax credit status can be endogenous to discretionary decisions such as dividend repatriation choices. Experimentation with other methods of distinguishing excess foreign tax credit firms from deficit foreign tax credit firms had little impact on the results.

16. The mean ratio of foreign to total assets in our sample for 1986 is 0.247; the median is 0.219, and the standard deviation is 0.152.

**Table 9.1** Debt and Property, Plant, and Equipment Accumulation, by Foreign Asset Concentration and Foreign Tax Credit Status, 1986–1991

	Foreign Assets/Total Assets below Median		Foreign Assets/Total Assets above Median	
	Excess FTC	Deficit FTC	Excess FTC	Deficit FTC
Number of firms	97	96	92	101
(Change in debt)/assets				
Mean	0.13678	0.13426	0.10556	0.15447
Median	0.11705	0.05519	0.06016	0.14446
Standard deviation	0.28151	0.22383	0.12348	0.24886
(Change in PPE)/assets				
Mean	0.13847	0.15538	0.13395	0.18940
Median	0.11121	0.07145	0.13104	0.14902
Standard deviation	0.24350	0.29645	0.22000	0.29366

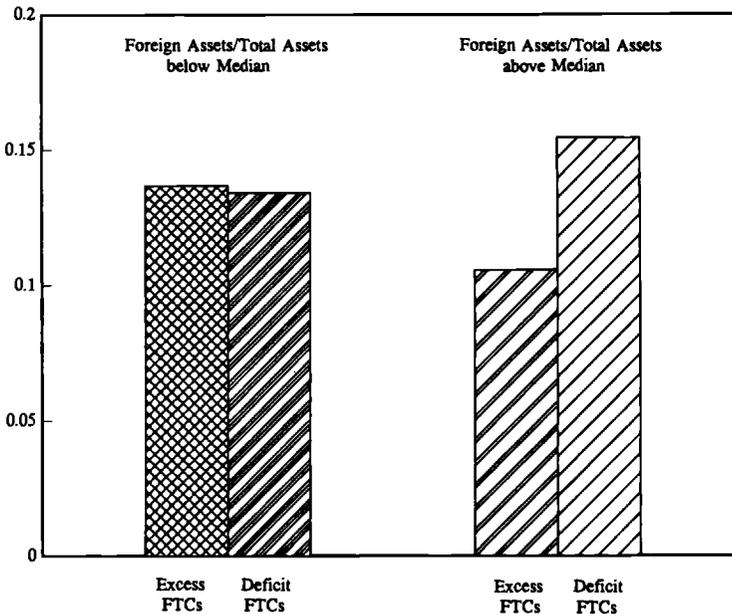
*Notes:* Firms are classified into cells based on foreign assets/total assets ratios in 1986, and by foreign tax credit (FTC) status as calculated over the 1986–91 period. (Change in debt)/assets is the difference between total debt in 1991 and total debt in 1986, divided by total assets in 1986. (Change in PPE)/assets is the difference between net property, plant, and equipment in 1991 and net property, plant, and equipment in 1986, divided by total assets in 1986.

relative to 1986 assets, and slower mean growth of property, plant, and equipment, than do deficit credit firms. This pattern appears for multinational firms with small fractions of foreign assets (except for a negligible difference in debt changes for excess and deficit foreign tax credit firms with small amounts of foreign assets), but is considerably more dramatic for firms with high fractions of foreign assets.

Figure 9.1 illustrates the mean growth of debt relative to 1986 asset levels for firms in each cell reported in table 9.1. The figure indicates that the impact of excess foreign tax credits appears only in firms with significant foreign assets, which is consistent with the discussion in section 9.2. Furthermore, there is a marked difference between the cumulative growth of debt in excess foreign tax credit firms and deficit foreign tax credit firms. A similar pattern appears in firms' accumulation of property, plant, and equipment, as illustrated by figure 9.2. This figure indicates that the impact of excess foreign tax credits on the accumulation of property, plant, and equipment is most dramatic for firms with significant foreign assets as a fraction of total assets.

Froot and Hines 1995 provides a more detailed statistical analysis of the behavior of the firms in this sample. The statistical results are quite consistent with the picture that emerges from table 9.1 and figures 9.1 and 9.2. Even after controlling for industry and degree of multinationality, firms that were unable to deduct 100 percent of their U.S. interest expenses accumulated 4.2 percent less debt (measured as a fraction of total firm assets) and 3.5 percent less property, plant, and equipment than did other firms over the period 1986–91.

There are two possible interpretations of the tendency for firms with excess

$\Delta$ Debt/1986 Assets

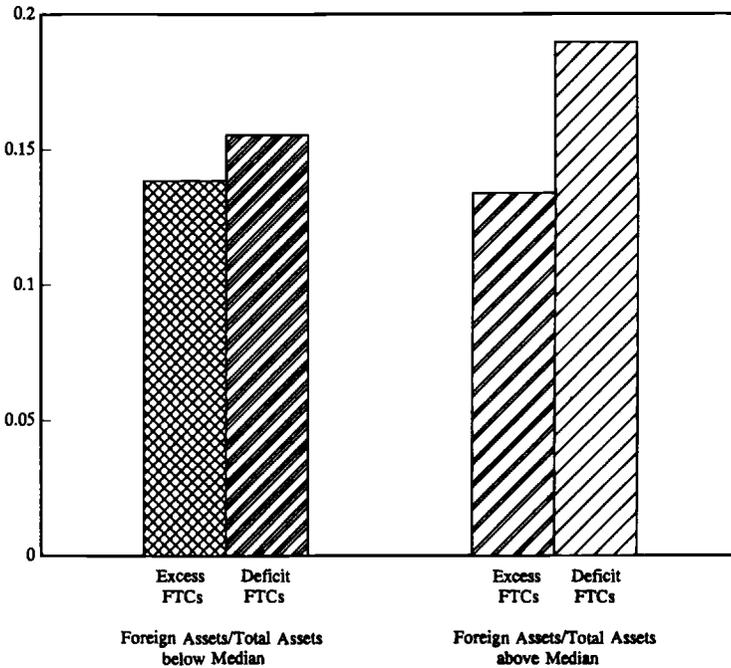
**Fig. 9.1** Debt accumulation (as a fraction of 1986 assets), by tax status, 1986–1991

*Notes:* Bars measure the ratios of five-year changes (1986–91) in book values of debt to 1986 book assets. Entries depict this ratio for the firm with the median ratio in each characteristic. Of the 193 firms with below-median ratios of foreign assets to total assets in 1986, 97 were classified as having excess foreign tax credits and 96 as having deficit foreign tax credits. Of the 193 firms with above-median ratios of foreign assets to total assets, 92 were classified as having excess foreign tax credits and 101 as having deficit foreign tax credits.

foreign tax credits and high ratios of foreign to total assets to accumulate property, plant, and equipment more slowly than do other firms. The first is that the loss of debt tax shields experienced by these firms results in a higher overall cost of capital and, consequently, a lower level of investment. Of course, to the extent that firms substitute away from debt finance toward cheaper after-tax financing sources, these substitutions can mitigate the increased cost of capital.<sup>17</sup>

The second interpretation is that firms do not face *any* increases in the cost

17. In an extreme case, it is possible for these substitutions to reduce to zero the cost of the change in the interest allocation rules. The size of the predicted cost corresponds to the ease with which firms can adjust their financial and operating patterns. Naturally, different models of firm behavior carry different predictions. Stiglitz (1973) argues that the tax advantage to debt makes borrowing a firm's preferred method of financing marginal investments. If this argument is correct, and firms continue to prefer debt to other financing methods even after some of its tax advantages are lost due to the interest allocation rules, then firms will react to the tax changes, not by substitut-

$\Delta$ PPE/1986 Assets

**Fig. 9.2 Property, plant, and equipment accumulation (as a fraction of 1986 assets), by tax status, 1986–1991**

*Notes:* Bars measure the ratios of five-year changes (1986–91) in book values of property, plant, and equipment (PPE) to 1986 book assets. Entries depict this ratio for the firm with the median ratio in each characteristic. Of the 193 firms with below-median ratios of foreign assets to total assets in 1986, 97 were classified as having excess foreign tax credits and 96 as having deficit foreign tax credits. Of the 193 firms with above-median ratios of foreign assets to total assets, 92 were classified as having excess foreign tax credits and 101 as having deficit foreign tax credits.

of *employing* capital, but that they reduce property, plant, and equipment expenditures by leasing rather than owning capital. Lease prices reflect both the costs of depreciation and the costs of holding capital. The tax law, however, entitles lessees to deduct the full costs of their lease payments, without allocating the capital component between foreign and domestic source. Hence, if a

ing other financing methods for debt, but by reducing the size of foreign and total operations. Alternatively, the Miller (1977) model of financial equilibrium implies that firms impacted by the interest allocation rules will change their capital structures to pure equity finance. As long as the capitalization of the affected firms does not exceed the initial amount of equity on the market, this type of financial arbitrage implies that the interest allocation rules will not affect the capital costs, or real operations, of any firms. Gordon and Malkiel (1981) examine a model in which debt is tax-preferred, but its use raises the probability that a firm will incur costs associated with bankruptcy; this model carries implications between those of the Stiglitz and Miller models.

multinational firm leases capital from a debt-financed, purely domestic entity, the interest cost of holding that capital will be fully deductible against U.S. taxes. Thus, leases may represent low-cost devices to preserve the tax shield for a given amount of property, plant, and equipment. This suggests that excess foreign tax credit firms—particularly those with higher foreign asset ratios—had incentives to expand more rapidly the use of leases than did deficit foreign tax credit firms. And indeed, evidence reported in Froot and Hines 1995 indicates that firms that were unable to deduct 100 percent of their U.S. interest expenses were significantly more likely than were other firms to undertake new leases after 1986.<sup>18</sup>

The leasing evidence raises the possibility that firms can easily substitute away from debt financing as debt becomes more expensive. If, for example, leasing can be done at the same after-tax cost as buying, then the tax-law change may just encourage low-cost substitution. Of course, it is unlikely that wholesale substitution is costless, and many of the results are also consistent with the proposition that excess foreign tax credit firms face relatively greater costs of capital after 1986. Firms may choose to fund property, plant, and equipment off the balance sheet as a way of capturing *part* of the otherwise-lost tax shields. The portion that cannot be captured is a real cost. This may lead excess foreign tax credit firms to underinvest, to grow more slowly, and to restrict the scope of foreign operations; this behavior, in turn, reduces their needs for debt financing. The tax-law change may also skew investments by affected firms away from businesses in which the tax deductions are crucial to be competitive. In this way, the loss of U.S. multinational tax shields could represent substantial firm-specific costs.

One way to distinguish these possibilities is to examine changes in foreign and domestic operations after 1986. Firms that are unable to finance costlessly around the tax change face higher costs of holding foreign assets after 1986, since high ratios of foreign to domestic assets reduce interest tax deductions on outstanding debt. The results reported in Froot and Hines 1995 indicate that firms affected by the change in interest allocation rules scaled back their foreign operations in response. The affected firms also reduced the size of their total (domestic plus foreign) operations. Since there is no reason to expect these reactions from firms with access to low-cost substitutes for debt, this evidence indicates that the 1986 act imposed significant costs on firms with excess foreign tax credits.

18. Operating leases (to which we refer) are not included on the balance sheet, and the associated lease payments are fully deductible against U.S. taxable income. Capital leases, on the other hand, *are* included on the balance sheet, and their associated lease payments are (as is true of debt) allocated for tax purposes between domestic and foreign sources by section 861-8. We use measures of investment that include changes in capital leases but not in operating leases, and it is operating leases that are preferred by firms unable to take full advantage of lease tax deductions. See, for example, Smith and Wakeman 1985; Edwards and Mayer 1991.

## 9.4 Conclusion

The financing and investment patterns of American multinational firms reveal evidence of recent changes in the interest allocation rules. Specifically, the loss of full tax deductibility of parent-company interest expenses appears to have significantly reduced borrowing and investment by multinational firms with excess foreign tax credits. These results are consistent with the hypothesis that firms substitute away from debt when it becomes more expensive, as well as the hypothesis that the loss of interest tax deductibility increases a firm's cost of capital.

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