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The effect of the tax reform act of 1986 on the location of assets in financial services firms

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Abstract

This paper examines the effects of the Tax Reform Act of 1986 on the international location decisions of U.S. financial services firms. The Act included rule changes that made it substantially more difficult for U.S. firms to defer U.S. taxes on overseas financial services income held in low-tax jurisdictions. We use information from the tax returns of U.S. corporations to examine how local taxes affect the allocation of financial assets held abroad by financial services firms. We find that, before the Act, the location of reported assets in financial subsidiaries was responsive to differences in host country tax rates across jurisdictions. However, after the Act, differences in host country tax rates no longer explain the distribution of assets held in financial services subsidiaries abroad. Our results suggest that the tightening of the anti-deferral provisions applicable to financial services companies has been successful in diminishing the effect of host country income taxes on asset location decisions.

Keywords: Multinational; International taxation; Investment policy; Financial services; Tax Reform Act of 1986

JEL classification: H25; H32; H87

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1. Introduction

The Tax Reform Act of 1986 (hereafter TRA'86) significantly changed the tax environment faced by U.S. firms with operations abroad. One interesting by-product of the Act is its widening of the gap between the treatment of income earned by financial service subsidiaries of U.S. multinationals and income derived from manufacturing operations. Among other changes, the Act made it substantially more difficult to defer U.S. taxes on overseas financial services income of U.S. firms. In this paper we investigate whether this 'tightening' of the anti-deferral rules affected the location of reported financial assets held abroad in U.S. financial affiliates.

Under U.S. tax law, income earned by U.S. firms in foreign jurisdictions is subject to U.S. taxation.[1] However, the active income from foreign operations that are organized as subsidiaries is not subject to U.S. taxation until it is repatriated to the U.S. parent corporation. The ability to defer U.S. tax liabilities on foreign-source income creates incentives for firms to locate operations in low-tax, or tax haven, jurisdictions. The 'Subpart F' provisions of the tax code, enacted in 1962, are designed to hamper the ability of firms to avoid U.S. taxes on international income permanently by retaining it abroad in low-tax countries. As we explain further below, changes made in 1986 to the Subpart F provisions essentially eliminated deferral on active financial services income. These rule changes were not applied to other forms of active income. As a result, TRA'86 created an environment in which the tax incentive to locate operations in low-tax jurisdictions depends on the 'type' of active income the subsidiary is expected to generate. After TRA'86, there is still a tax advantage to locating manufacturing operations in low-tax countries since these operations generate active income that enjoys deferral. However, this tax incentive was greatly diminished for subsidiaries that generate relatively large amounts of active financial services income.

The policy changes in TRA'86 targeted at financial services income provide an opportunity to examine how the location decisions of U.S. multinational corporations respond to taxation. In particular, we use information from the tax returns of U.S. corporations for 1984, 1992, and 1994 to examine how local taxes affect the allocation of financial assets held abroad in financial services firms before and after the Act (International Monetary Fund, 1984, 1992 and 1994). We focus on the hypothesis that, by effectively eliminating deferral on active financial services income, TRA'86 diminished any role played by host taxes in influencing the location decisions of U.S. firms with financial subsidiaries abroad.[2] Our results are

[1] See Hines and Hubbard (1995) for a brief summary of U.S. tax policy towards multinational corporations.

[2] Other provisions of TRA'86 also have the effect of decreasing the importance of local tax rates for the location of assets in financial subsidiaries. These rule changes, which modify the calculation of the tax credit U.S. firms are allowed against U.S. tax liabilities for taxes paid to host countries, are discussed in the next section.

consistent with this hypothesis. We find that, before the Act, the location of reported assets in financial subsidiaries was responsive to differences in host country effective tax rates across jurisdictions. However, since the Act, the location of financial assets in these subsidiaries is not sensitive to variations in effective tax rates across countries. Our results for financial subsidiaries contrast with recent work by Altshuler et al. (2001), hereafter AGN, on the mobility of real assets held in manufacturing subsidiaries. Those authors find that real assets in manufacturing subsidiaries have become more sensitive to tax rate differences across foreign jurisdictions in recent years.

For the financial services industry, the changes embedded in TRA'86 moved the U.S. tax system closer to one in which 'capital export neutrality' is preserved for investments in low-tax countries. Capital export neutrality holds when investors pay the same level of taxes on investment projects regardless of where they are undertaken. Our results suggest that, as intended, TRA'86 decreased the importance of local taxes in the location decisions of financial services firms. While manufacturing firms can continue to exploit differences in effective tax rates to minimize tax liabilities, financial service firms have much less latitude to do so.

Whether the Act has increased the U.S. tax system's neutrality with respect to the location of real business activity in the financial services industry remains an open question. Our data reports the stated location of subsidiary financial assets for tax and financial accounting purposes which may not reflect the actual location of real business activity.[3] Financial services firms may use business structures in low-tax or tax haven jurisdictions to shift income out of high-tax jurisdictions. The use of these structures may disguise the location of the real financial business activity that generates financial services income. Although we can not determine whether there has been a change in the response of the underlying real activity to differences in host country tax rates, our results do indicate that the Act reduced the tendency of financial services firms to use business structures in low income tax regimes to minimize worldwide tax liabilities.

Another open question is the extent to which TRA'86 has impacted the competitiveness of U.S. financial service firms who must compete for international market share with subsidiaries of firms from countries in which foreign-source income is exempt from taxation ('territorial' tax systems). Previous research on the impact of TRA'86 on the operations of the financial services industry abroad has, for the most part, focused on how the Act affects hypothetical U.S. firms. Horst (1997) calculates the effective tax rate in a low-tax country faced by a hypothetical subsidiary in the property and casualty insurance business. He contrasts the effective tax rates faced by subsidiaries with parents in the U.S. with effective tax rates that might be faced by subsidiaries with home bases in other foreign

[3]Reported assets held in financial services subsidiaries are, for the most part, financial and not real assets (such as property, plant and equipment). This contrasts with manufacturing subsidiaries in which the bulk of total assets are comprised of property, plant, and equipment. We provide more detail on the composition of the asset data we use in our analysis in Section 3.

countries.[4] He finds effective rates of taxation for affiliates with U.S. parents that were as much as 145 percent higher than those faced by affiliates from other countries. These higher effective tax rates were mainly the result of the 1986 changes to the Subpart F rules that eliminate deferral of U.S. tax on active financial services income.

Dunahoo et al. (1997) focus on the total tax burden of a hypothetical life insurance subsidiary incorporated abroad. They also find that the Subpart F rules under which certain financial services income is currently taxed may have had important effects on the competitiveness of U.S. multinational corporations. In their example, a life insurance subsidiary with a U.S. parent faced a total tax burden that is 24.1 percent greater than an identical subsidiary with a French, German, Dutch, or British parent after the passage of TRA'86.

While suggestive, this research has not uncovered whether the competitive position of U.S. firms in the financial services industry has changed due to the Act. This is most likely because data on the market share of U.S. and foreign financial services firms in host country markets (low-tax countries, in particular) from before and after TRA'86 is necessary to address the competitiveness issue. We were unable to locate a set of data rich enough to include market share information over the required time period for both U.S. financial services affiliates and affiliates of parents incorporated in 'territorial' countries (or any other country that does not apply current taxation to active financial services income). Instead we focus on whether moving the tax system towards capital export neutrality has had any impact on the role played by taxes in the location of assets in financial services subsidiaries abroad.

The remainder of the paper is organized as follows. Section 2 contains a brief legislative history of the anti-deferral (Subpart F) regulations along with a discussion of other tax law changes in TRA'86 affecting the financial services sector. Section 3 discusses the methodology we use to measure the sensitivity of location decisions to effective tax rates and describes the tax return data. Our results are presented in Section 4. The final section concludes and offers suggestions for future research.

2. A brief legislative review

To place the provisions of the Tax Reform Act we study in context, we begin with a brief overview of the pertinent U.S. tax rules. We start with the basics before moving on to the specific changes to the Subpart F provision that are the focus of the paper. U.S. multinationals are taxed on income earned both inside and

[4]The countries are Switzerland, the Netherlands, Belgium, Hong Kong, Japan, the United Kingdom, Germany, France, Denmark, Sweden, and Canada. Horst points out that none of these countries applies current taxation to the active business income of subsidiaries in the financial services sector.

outside the United States. To prevent income earned abroad from being taxed twice, the U.S. allows firms to claim foreign tax credits for income taxes paid to foreign governments. These tax credits can be used to offset U.S. tax liability on foreign-source income. For example, suppose a multinational corporation earns $100 in a country with a 25 percent tax on corporate profits while the current corporate tax rate in the U.S. is 35 percent. Under the foreign tax credit system, the multinational is allowed to credit the $25 tax paid to the foreign government against the $35 owed to the U.S. government, leaving a residual U.S. tax liability of $10 on the $100 of foreign-source income.

A limitation on the credit prevents U.S. firms from using foreign tax credits to reduce U.S. tax liabilities on income earned at home. The limit is the amount of tax that would be due if the foreign income were earned in the U.S. Suppose now that the multinational earns $100 in a country with a tax rate of 45 percent. Since the U.S. tax rate is 35 percent, the foreign taxes paid ($45) exceed the U.S. tax liability ($35) on the $100 of foreign-source income. A firm in this situation is said to be in an 'excess credit' position because it has more foreign tax credits than can be claimed in the current year.[5] The same firm would be said to be in an 'excess limitation' position if it had earned the $100 in a country with a tax rate below the U.S. rate.

In some situations, the foreign tax credit system allows firms to use excess credits from one source of foreign income to offset U.S. tax payments on income from another source — a procedure known as 'cross-crediting' or 'averaging.' To understand how cross-crediting works, we assume that the multinational firm earns $100 in each country — the low-tax country with a tax rate of 25 percent and the high-tax country with a tax rate of 45 percent. Cross-crediting allows the U.S. parent corporation to offset the $10 of U.S. tax liability on the $100 repatriated from the low-tax affiliate against the $10 of excess credits on the $100 repatriated from the high-tax affiliate. As a result, no residual U.S. tax is due on the $200 of foreign-source income. Firms may only average income of the same type of 'basket' for the purpose of the foreign tax credit; as we explain below, averaging is allowed within baskets, but not across baskets.

The time at which the U.S Treasury taxes foreign profits depends on how the multinational has organized its foreign operations. If those operations are organized as subsidiaries (they are separately incorporated in the foreign country), then the profits are not *generally* taxed until they are paid to the U.S. parent corporation. The profits of foreign operations organized as branches (they are not separately incorporated in the foreign country) are taxed upon accrual.

Prior to the Revenue Act of 1962, multinationals enjoyed deferral on all classes of foreign-source income earned by foreign subsidiaries (with the exception of

[5]Under current law, excess credits can be carried back to offset any U.S. tax payments on foreign-source income made in the previous two years. Credits may also be carried forward without interest and used to offset U.S. tax liability in the following five years.

income earned in foreign personal holding companies). The Revenue Act created the Subpart F provisions in an effort to hamper the ability of firms to avoid U.S. taxes on foreign income by retaining it abroad in low-tax jurisdictions.[6] In general, these 'anti-tax avoidance' provisions deny deferred taxation on foreign subsidiary income that is considered abusive. The original provisions impose accrual taxation on certain 'passive' income such as that income earned from investments in financial assets, foreign base company sales and services income, and income derived from the insurance of U.S. risks. Income from active business investments abroad continued to enjoy deferred taxation.

Since the Subpart F provisions were enacted in 1962, Congress has expanded their scope to include additional types of foreign subsidiary income.[7] TRA'86 substantially eroded the ability of financial services firms to defer foreign-source income by incorporating within Subpart F additional categories of both passive and active income. The Act's provisions terminated deferral on dividends and interest earned by financial services subsidiaries regardless of whether the income was generated from the conduct of active business, on third-party insurance income, and on shipping income regardless of whether it was reinvested in shipping assets. To a large extent, TRA'86 eliminated deferral on foreign financial services income. At the same time, U.S. multinationals generating active (non-financial) income through manufacturing affiliates were not affected by the Act's expanded Subpart F provisions.

TRA'86 represented a major overhaul to the U.S. tax system and, as such, included other important provisions for the taxation of foreign-source income. The Act lowered the corporate tax rate from 46 to 34 percent and at the same time broadened the tax base through modifications of depreciation schedules and the repeal of the investment tax credit. All else being equal, the lower corporate tax rate would be expected to shift multinationals toward excess credit positions, leaving firms with no additional tax liabilities to the U.S. Treasury on income repatriations from abroad. Interestingly, the United States did not become a 'low-tax' country; tax rates in many capital importing countries were lowered after the imposition of the Act. Grubert et al. (1996) find that in 1992 only 35 percent of foreign source income was received by U.S. multinational corporations with excess credits, which is comparable to the 33 percent of foreign source income

[6]The Subpart F rules were the outcome of a debate on whether to entirely eliminate deferral. Congress supported deferral, the administration supported accrual taxation. Since 1962 there have been numerous proposals to end deferral. See Appendix A of Hufbauer (1992) for a short history of deferral in the U.S. tax system. See also Hubbard (1995); National Foreign Trade Council (1999); and Hines (1999b) for a review of more recent policy debates about deferral.

[7]The Tax Reduction Act of 1975 disallowed deferral on shipping income that was not reinvested in shipping assets. This act also eliminated deferral of passive income earned in tax haven countries by repealing the safe harbor minimum distribution rules in Subpart F. The Tax Equity and Fiscal Responsibility of 1982 expanded Subpart F to include foreign oil-related income.

received by such firms in 1984. Their analysis of Treasury tax return data shows a substantial decrease in average effective tax rates on repatriated income that they conclude is primarily due to reductions in country average tax rates.

As with the modifications to the Subpart F rules, changes to the foreign tax credit limitation embedded in TRA'86 impacted parent corporations with financial services subsidiaries and manufacturing subsidiaries differentially. Prior to the Act, there were six separate foreign tax credit baskets: (1) passive interest income, (2) domestic international sales corporation dividend income, (3) foreign sales corporations dividend income, (4) foreign trade income of a foreign sales corporations, (5) oil and gas extraction income, and (6) all other foreign-source income. The goal of the basket system is to separate income that bears extremely high foreign taxes from income of a different type or category that bears little or no foreign tax. TRA'86 expanded the number of baskets, decreasing the potential to average for the purpose of the foreign tax credit, particularly so for financial income.[8] The new baskets included one for high-withholding-tax interest income, an expanded passive income basket that captures passive income generally (not just interest income), a separate basket for financial services income, a separate basket for shipping income and a separate basket for the dividends of each noncontrolled (between 10 and 50 percent) foreign corporation.

Our argument that TRA'86 moved the tax system closer to one in which capital export neutrality is preserved for the financial services sector ignores the Act's changes to the foreign tax credit limitation and their impact on the ability of firms to cross-credit. As with the changes to the Subpart F rules, the increase in baskets was motivated by a concern that income generated from financial assets could be easily shifted and, in this case, used to absorb excess credits from unrelated highly taxed business operations. Congress was also concerned that, on balance, cross-crediting created a situation in which foreign investment was favored over U.S. investment.[9] Allowing for cross-crediting can move the tax system closer to or further from capital export neutrality depending on the foreign tax credit position of multinational corporations.[10] Parent firms in excess limitation positions are indifferent between investments at home and in low-tax countries abroad since (ignoring deferral) they face the same tax rate at home and abroad. Multinationals in excess credit positions, however, prefer investments in low-tax locations over

[8] As explained in the Joint Committee on Taxation's *General Explanation of the Tax Reform Act of 1986*, ''A separate or special limitation generally is applied to a category of income for one of three reasons: the income's source (foreign or U.S.) may be manipulated; the income typically bears little or no foreign tax; or the income often bears a rate of foreign tax that is abnormally high or in excess of rates on other types of income. Applying a separate limitation to a category of income prevents the use of foreign taxes imposed on one category of income to reduce the U.S. tax on other categories of income (page 856)''.

[9] See, for example, U.S. Congress (1987), page 862.

[10] See, for example, the discussion in Altshuler and Newlon (1993) and Cummins and Hubbard (1995).

investments in high-tax locations, since excess credits absorb any residual tax owed to the U.S. government on income repatriated from low-tax jurisdictions.

Increasing the number of separate limitation baskets makes cross-crediting more difficult and, along with the changes to the Subpart F provisions, can move the tax system towards capital export neutrality. To see this, consider two groups of parent corporations in the financial sector — one group with excess credits in the pre-TRA'86 basket that contained financial services income and one group in excess limitation. Adding a separate basket for financial services income makes it difficult for the firm with excess credits in the pre-TRA'86 basket to absorb residual tax liabilities from investments generating lightly taxed income (investments in low-tax countries, for example). This is because after TRA'86, the lightly taxed income would generally be in a separate basket and therefore cannot be averaged with high-tax income to reduce U.S. tax liabilities. As a result, these parent firms will no longer favor low-tax investments over investments at home or in high-tax countries. Parent firms in excess limitation face capital export neutrality for low-tax investments both before and after TRA'86. Taken together, both the changes to the anti-deferral laws and the foreign tax credit arguably move the system closer to capital export neutrality for the financial services sector.

A growing body of research has investigated the extent to which multinational firms respond to changes in the tax environment they face (see, e.g., the reviews in Hines, 1997, 1999a) and empirical evidence supports the idea that tax policy plays an important role in the economic decisions of multinational corporations. However, the previous research has not focused on the impact of TRA'86 (or previous tax changes) on the behavior of financial services firms. As mentioned above, the changes to Subpart F for these firms were predicated on the belief that the activities and investments of these firms were highly mobile and therefore very sensitive to tax differences across jurisdictions. A natural question to ask is whether there is any evidence that differences in host country tax rates explain the distribution of assets of financial services firms abroad. A more precise way of asking this question is to pose it in terms of a measure of sensitivity: How responsive is the location of assets in financial services affiliates to differences in host country tax rates?

As we explained above, TRA'86 moved the system closer to capital export neutrality (with respect to investments in low-tax locations) for financial services firms. As a result, if firms are sensitive to differences in effective tax rates, we may explore whether this sensitivity has diminished after TRA'86. In other words, has the location of assets in financial services firms become less responsive to host country taxes? AGN address these questions in their analysis of the location of real assets held in the manufacturing affiliates of U.S. manufacturing parent firms. We focus instead on firms in the financial services sector.

AGN use data from the U.S. Treasury tax return files for 1984 and 1992 to estimate the responsiveness of direct investment abroad to after-tax rates of return. Unlike previous studies, these researchers' access to more than one year of cross-sectional data allowed them to estimate tax elasticities that control for fixed

country effects. They focus on the allocation of real assets held abroad by manufacturing affiliates of U.S. manufacturing parents and find evidence that it has become more sensitive to differences in effective tax rates across host countries over their sample period. Their estimates with country fixed effects yield an elasticity of real assets to changes in after-tax rates of returns of 2.8 in 1992 and 1.5 in 1984.[11] Both the point estimates and the difference between them are statistically significantly different from zero at standard confidence levels. This work suggests that the influence of taxes on location decisions has become more pronounced. To preview our results, using information from the same data source as AGN, we find evidence that TRA'86 may have led to a decrease in the mobility of assets for financial services firms.[12]

3. The data

The data were provided to us by the Statistics of Income (SOI) division of the Internal Revenue Service.[13] SOI collects information from a number of tax and information forms filed by U.S. multinational corporations. We requested information from the Form 5471, which reports on the activities of each controlled foreign corporation (hereafter CFC) of a U.S. parent. This form contains subsidiary level information on assets, taxes paid, earnings and profits, and other information from balance sheets and income statements. We obtained information on total CFC assets (cash, inventories, buildings and other depreciable assets, land, loans to stockholders and related persons, investment in subsidiaries, and intangible assets), real CFC assets (inventories, buildings, and other depreciable assets), earnings and profits before income taxes, and income taxes.[14]

[11] AGN include a measure of trade restrictions as an explanatory variable in their regression models so the elasticity estimates reported above are for countries with the most open trade regimes (for which the trade restriction variable is zero). Adjusting the 1992 elasticity, for example, by trade regime (using 1992 real capital stocks as weights) gives a slightly lower tax elasticity of 2.64.

[12] Neither this study nor AGN analyzes the effect of taxes on the choice of investing at home or abroad. Our empirical models focus instead on the choice of investment locations across foreign jurisdictions.

[13] The data were provided in response to a special data request that was necessary to obtain information by industry.

[14] Corporations are required to report the historical book value of assets according to U.S. accounting principles. As AGN notes, this reporting standard prevents the asset figures from being distorted by host country investment incentives. However, host country inflation and exchange rates could affect the measures. Another problem with the asset measures in the SOI data involves the actual location of the assets reported. CFCs report assets based on their country of incorporation. However, the country of incorporation may not be where the capital is actually located. Grubert and Mutti (2000) were able to use additional data, not available in our file, to classify the real assets in their sample by the CFC's principal place of business (firms include this information on the Form 5471) instead of by the CFC's country of incorporation. The reclassification had little effect on their results (only 2 percent of real assets were affected).

The data provided to us by SOI are aggregated across financial CFCs by country.[15] We use data from the same years as AGN — 1984 and 1992 — and more recent tax return data for 1994. We supplemented the data with information on gross domestic product from the International Monetary Fund *International Financial Statistics* (International Monetary Fund, 1984, 1992 and 1994).[16] Our dataset contains complete information for 32 countries for the three years of analysis. Appendix A provides summary statistics for the dataset.

We use simple ordinary least squares to estimate the elasticity of assets to after-tax rates of return as in Grubert and Mutti (1991) and other studies. The after-tax rate of return is simply (1 − ETR), where ETR equals the country average effective tax rate. The basic estimating equation is thus:

$$\log(\text{Assets}_{it}) = \alpha_i + \beta_1 \log(1 - \text{ETR}_{it}) + \beta_2 \log(\text{GDP}_{it}) + \varepsilon_{it}, \quad (1)$$

where *i* subscripts countries and *t* subscripts years, ETR is the country effective tax rate, and GDP is gross domestic product. GDP can be interpreted as a 'scale' variable that reflects the economic size of countries. The estimated coefficient on the tax term, β_1, gives the (constant) elasticity of assets to changes in after-tax returns (for a given pre-tax return). This reduced-form relation between after-tax returns and investment is consistent with a partial equilibrium model in which firms allocate assets abroad to maximize after-tax returns to investment.

A difficult issue in estimating this type of location equation involves the appropriate choice of local tax rates. Researchers have debated the merits and drawbacks of using statutory corporate tax rates, marginal local effective tax rates, average local effective tax rates, and effective tax rates that include the impact of home country repatriation taxes to measure the incentive effect of taxes on location choices (see, for example, the empirical studies of taxes and location decisions reviewed in Hines, 1997, 1999a). We use country average effective tax rates in our empirical work for a variety of reasons. First, even if appropriate, marginal effective tax rates on income generated in financial operations abroad are not available for all of the years and countries in our sample. Second, statutory rates are unlikely to reflect the tax treatment of investments in different countries since they do not capture special incentives for different industries and/or different

[15]The 1984 sample includes all U.S. parent corporations with at least one CFC and total assets greater than $250 million in assets. All U.S. corporations with at least $500 million in assets were included in the 1992 and 1994 samples. However, the 1992 and 1994 samples contain information only for the top 7,500 CFCs in terms of asset size. These CFCs account for 94 percent of assets 'controlled' by all CFCs of U.S. multinational corporations with at least $500 million in assets in 1992 and 1994.

[16]In a few cases information on GDP was not available from the IMF statistics. In these cases we used information from the United Nations.

firms within countries.[17] Calculating an average effective tax rate across all financial subsidiaries will take into account the special provisions and tax incentives faced by firms in this industry in each country. Finally, although our use of host country average effective tax rates ignores the impact of home country repatriation taxes on location decisions, we feel the choice is an appropriate one for our analysis. Our hypothesis is that after TRA'86, the location of assets in financial subsidiaries should be less responsive to differences in host country tax rates across jurisdictions.

We calculate country average effective tax rates for financial CFCs by dividing total income taxes paid by total earnings and profits before income taxes. Only those CFCs with positive earnings and profits before taxes are included in the calculation to prevent the tax rate measure from being biased upwards. We do not include other taxes that may be imposed in host countries, such as property and assets taxes, because this information is not available in our data.

The first two columns of Table 1 report country average effective tax rates for the financial subsidiaries in our sample. We present country effective tax rates for 1984 and for the early 1990s, calculated as the average of the 1992 and 1994 country effective tax rates. Effective tax rates have declined significantly since 1984. Averaged over all countries, effective tax rates faced by financial subsidiaries abroad have fallen by more than 10 percentage points during the ten-year period spanned by our study[18].

There are some drawbacks to using these average effective tax rates in our empirical analysis. First, in some cases they are based on observations from a small number of subsidiaries. This likely adds noise to our tax rate measures. In addition, at an individual firm level, these tax rates are endogenous to investment decisions. Averaging across all CFCs in a country should diminish this relation to some extent.[19] However, we take some steps to investigate these problems in our empirical tests.

Although the focus of previous studies has been on the location of real assets held abroad, our emphasis on the behavior of multinational corporations with financial subsidiaries suggests that we should examine the relation between taxes and the placement of total, as opposed to real, assets. The last column of Table 1 provides information on the ratio of real to total assets for financial CFCs. Because

[17] Subsidiaries involved in manufacturing, for example, often receive tax incentives in the form of tax holidays. These tax incentives may depend on the location of the subsidiary and may expire after some years. Subsidiaries in the financial sector are also likely to face tax rules that result in tax burdens that do not correspond to statutory tax rates.

[18] This is consistent with the pattern shown in Table 1 of AGN, where estimated average effective tax rates for manufacturing declined from 0.321 in 1980 to 0.234 in 1992.

[19] Simply using average effective tax rates over all subsidiaries in a country does not eliminate the endogeneity problem. Effective tax rates may be low in a country in a given year because of an increase in investment qualifying for tax incentives in that year.

Table 1
Country effective tax rates and the ratio of real to total assets for financial subsidiaries of U.S. MNCs

	Effective tax rates		Ratio of real to total assets (average over 1984, 1992, and 1994)
	1984	1990s	
Argentina	0.226	0.172	0.084
Australia	0.207	0.160	0.052
Austria	0.032	0.100	0.079
Belgium	0.363	0.054	0.024
Bermuda	0.015	0.036	0.053
Brazil	0.270	0.118	0.062
Canada	0.214	0.193	0.056
Chile	0.404	0.097	0.039
Colombia	0.476	0.242	0.098
Denmark	0.215	0.240	0.110
France	0.275	0.112	0.182
Greece	0.057	0.233	0.037
Hong Kong	0.079	0.131	0.260
Ireland	0.101	0.026	0.076
Italy	0.368	0.268	0.079
Japan	0.490	0.126	0.117
Luxembourg	0.242	0.040	0.019
Malaysia	0.325	0.165	0.010
Mexico	0.177	0.155	0.114
Netherlands	0.109	0.057	0.042
Norway	0.629	0.108	0.164
Panama	0.019	0.098	0.015
Philippines	0.450	0.133	0.040
Singapore	0.231	0.076	0.027
Spain	0.312	0.144	0.038
Sweden	0.030	0.092	0.029
Switzerland	0.136	0.107	0.095
Thailand	0.256	0.258	0.018
United Kingdom	0.201	0.105	0.200
Uruguay	0.353	0.055	0.043
Venezuela	0.272	0.004	0.030
West Germany	0.305	0.207	0.131
Average	0.245	0.129	0.076
Standard deviation	0.151	0.071	0.060

Note: The first two columns report country average effective tax rates for financial subsidiaries of U.S. multinational corporations. The second column gives the average of the 1992 and 1994 effective tax rates for each country. Average effective tax rates in each country are calculated by dividing the total income taxes paid by controlled foreign corporations in the financial sector by their total earnings and profits. Information on the total income taxes paid, earnings and profits, and real and total reported assets comes from tax return information reported on the Form 5471 and provided by the Internal Revenue Service.

these ratios differed little over the sample period, we report the ratio, averaged over all three years, of real to total assets for each country. Real assets account for a very small percentage of total assets in financial affiliates (less than eight percent

on average).[20] These ratios suggest that the appropriate measure of assets in the financial sector regressions should be total assets. However, we also report results of a regression that uses information on real assets.

4. Empirical evidence on tax sensitivity

Instead of running cross-sectional regressions on each of the three years of data, we start by pooling the data. This allows us to test whether the tax elasticity (β_1) has changed over time.[21] To do this, we introduce additional terms (a year dummy and an interaction term) to Eq. (1) to produce separate estimates of the tax coefficient for each sample year. In particular, we include the following variables to the model in Eq. (1): $\log(1-\text{ETR})\times\text{Year92}$, $\log(1-\text{ETR})\times\text{Year94}$, Year92, and Year94. Year92, for example, is an indicator variable that equals one if the observation is from 1992, and equals zero otherwise. The coefficient on the interaction term, $\log(1-\text{ETR})\times\text{Year92}$, estimates the difference between the 1984 elasticity and the 1992 elasticity.

Our principal results for financial subsidiaries are reported in Table 2. The estimated tax elasticities and associated standard error for each year are reported in the bottom panel.[22] The first column presents the estimation results for the pooled regression. The tax elasticities for all of the sample years are large and statistically significantly different than zero. Furthermore, neither the 1992 nor the 1994 estimated elasticity is significantly different from the 1984 estimated elasticity (the coefficients on the interaction terms, $\log(1-\text{ETR})\times\text{Year92}$ and $\log(1-\text{ETR})\times\text{Year94}$, are not statistically significantly different from zero). Assets held in financial subsidiaries appear highly responsive to variations across jurisdiction in effective tax rates both before and after TRA'86. The elasticity estimates suggest that a one percent increase in after-tax returns leads to an increase in the total assets held by U.S. subsidiaries of between six and eight percent.

Cross-country variation in average effective tax rates may be correlated with unobserved differences in countries that affect their attractiveness for investment. As a result, the estimated effect of the tax term may reflect both tax and non-tax factors on investment decisions. One way of controlling for persistent unobserved

[20] Assets held in manufacturing affiliates of U.S. parents, on the other hand, are comprised mainly of real assets (62 percent of total assets on average). See Altshuler and Hubbard (2000) for analysis of the manufacturing affiliates in our sample.

[21] We also tested whether the coefficient on log(GDP) should be constrained to be the same in the three years. An *F*-test fails to reject the constrained model in both the pooled model and the fixed effects models.

[22] The tax elasticity estimates and standard errors for each year are estimated by running analogous regressions with different year dummies and interaction terms. For instance, to estimate the 1992 elasticity in the second column of Table 2, we replace the 1992 dummy with a dummy variable for 1984 and the 1992 tax interaction term with $\log(1-\text{ETR})\times\text{Year84}$. The coefficient on $\log(1-\text{ETR})$ in this new regression gives the estimated tax elasticity and associated standard error.

Table 2
Taxes and the location of assets held abroad in financial subsidiaries of U.S. corporations

Dependent variable	Log of total assets (1)	Log of total assets (2)	Log of total assets (3)	Log of real assets (4)
Constant	20.08	20.54	18.18	8.60
	(1.09)	(1.94)	(1.52)	(2.08)
Log(1−ETR)	6.49	3.16	3.14	0.56
	(2.99)	(1.71)	(1.71)	(1.66)
Log(GDP)	0.58	0.05	0.24	1.97
	(0.14)	(0.53)	(0.50)	(0.60)
Log(1−ETR)×Year92	1.41	−4.08		
	(4.16)	(2.35)		
Log(1−ETR)×Year94	0.38	−3.61		
	(3.70)	(2.04)		
Log(1−ETR)×Year90s			−3.97	−3.80
			(1.99)	(2.72)
Year92	0.45	0.60		
	(1.11)	(0.83)		
Year94	0.68	0.96		
	(1.09)	(0.81)		
Year90s			0.59	−0.48
			(0.78)	(0.82)
Country dummies?	No	Yes	Yes	Yes
	96	96		
Adjusted *R* squared	0.34	0.83	0.83	0.80
Number of observations	96	96	96	96
Tax elasticities by year				
1984	6.49	3.16	3.14	0.56
	(2.99)	(1.71)	(1.71)	(1.66)
1992	7.90	−0.92		
	(2.96)	(1.44)		
1994	6.87	−0.45		
	(2.22)	(1.47)		
1990s			−0.83	−3.23
			(1.49)	(2.09)

Notes to Table 2: ETR is equal to the country average effective tax rate. The dummy variables Year92 and Year94 equal one for 1992 and 1994, respectively. The dummy variable Year90s equals one for 1992 and 1994. The columns report coefficients estimated using OLS. The bottom panel reports tax elasticity estimates from each regression. White-corrected standard errors are in parentheses.

differences across countries is to add country dummy variables to the right-hand side of Eq. (1). The results from this country fixed-effects specification are presented in the second column of Table 2. These estimates suggest that, for financial subsidiaries, variation in effective tax rates across countries is correlated with country characteristics. The tax coefficients are reduced in both size and

statistical significance. In fact, the estimated 1992 and 1994 tax elasticities shown in the lower panel are negative in the second column and no longer statistically significantly different from zero. The coefficients on the interaction terms are statistically significantly different from zero (at the 10 percent confidence level), suggesting that assets have become less sensitive to differences in effective tax rates across locations since 1984. The estimated 1984 tax elasticity is still statistically significantly different from zero at conventional levels of significance, but the magnitude of the estimated coefficient is less than half of the estimate from the first column.

In the model presented in the third column of Table 2, we constrain the 1992 and 1994 tax elasticities to be equal (an F-test fails to reject the model that constrains them to be the same). This formulation contains a new interaction term, $\log(1-\text{ETR})\times\text{Year90s}$, where Year90s equals unity if the data are from the years 1992 or 1994, and equals zero if the data are from 1984. The coefficient on the new interaction term measures the difference between the 1984 tax elasticity (the pre-TRA'86 elasticity) and the tax elasticity for the later sample years (the post-TRA'86 elasticity). The estimates for the remaining coefficients are similar to those in the second column. The estimated 1984 tax elasticity is about 3, and is still statistically significantly different than zero at the ten percent level of confidence; the post-TRA'86 tax elasticity is negative and not statistically significantly different from zero. The difference between the elasticities, our key variable, is large (about four) and is now significant at the five percent level.

We explored some alternative specifications to test the sensitivity of our results to the measurement of effective tax rates and to the inclusion of countries that may be outliers. First, we removed countries with small populations (under one million people) that may best be classified as tax havens for financial affiliates (Bermuda and Luxembourg). These exclusions had little impact on our results. A natural experiment given our hypothesis would be to eliminate all countries that had effective tax rates higher than the U.S. rate in 1992 and 1994. The tightening of the Subpart F rules should have no effect on the choice of investment across high-tax countries. However, only one country in our sample had a higher tax rate than the U.S. rate (Denmark in 1992 had an effective tax rate of 38 percent).

The remaining experiments addressed various potential problems with our measure of effective tax rates. One concern is that some of the country tax rates were calculated with data from few CFCs. To explore the role played by these observations in our estimates, we eliminated countries with fewer than six CFCs in any year. The results continue to point to a diminished role over time for taxes in the location of assets held in financial subsidiaries.[23] A more difficult measurement

[23]This experiment reduced both the size and significance of the 1984 elasticity. However, as in our full-sample estimates, the post-1984 elasticity remained negative and statistically insignificantly different from zero. Further, the key variable in our analysis, the difference between the elasticities across the time period, is statistically significantly different from zero at conventional levels of significance and of similar magnitude to the column 3 estimate.

problem to address in our sample is the possible endogeneity of country average effective tax rates to current investment decisions. We experimented with replacing current effective tax rates with their lagged and future values.[24] Neither experiment led to qualitative differences in our results.

An important policy question is whether the Act had any impact on the sensitivity of the location of real business activity to local tax rates. This is a difficult question to address for the financial sector since, as the third column of Table 1 shows, less than ten percent of reported assets (on average) for this sector are real. Also, for this service industry, the location of real assets may not a reliable indicator of where actual business activity takes place. Finally, as mentioned in the introduction, our data reflects where corporations report assets which may not correspond to where assets are located. With these caveats in mind, we investigate whether reported real assets have become less sensitive to differences in effective tax rates across jurisdictions. The fourth column of Table 2 reports estimates from a regression that uses the log of real assets as the dependent variable. The 1984 tax elasticity is less than one and is not statistically different from zero. Interestingly, although it is not statistically significant at conventional levels, the difference in tax elasticities between 1984 and the post-TRA'86 years is negative and of similar magnitude to the estimate in column 3 for total assets.

Comparing our results for financial subsidiaries to AGN's study of manufacturing CFCs suggests that the changes in TRA'86 did, as expected, have a differential impact on firms in the financial industry.[25] While AGN find that the placement of manufacturing assets has become more responsive to variations in effective tax rates across locations during our time period, our estimates reveal that the allocation of total assets held in financial affiliates can no longer be explained by these variations. The results suggest that moving the tax rules for multinational corporations toward capital export neutrality reduces, as intended, the role played by taxes in the location of assets abroad. Further, our estimates show that prior to the Act the total assets held in financial subsidiaries were substantially more sensitive to differences in host country effective tax rates than the real assets held in manufacturing subsidiaries (our 1984 tax elasticity estimate of about 3 for

[24] In one experiment, we use the 1994 and 1984 data, but substitute 1992 effective tax rates for the 1994 rates. In the other, we use the 1992 and 1984 data, but substitute 1994 rates for the 1992 effective tax measures.

[25] In a previous version of this paper, Altshuler and Hubbard (2000), we present regression results for both financial and manufacturing CFCs. Although our sample includes information for both 1992 and 1994, and is composed of a different set of manufacturing affiliates (those associated with U.S. parents in all industry classifications) and a smaller set of countries (40 versus 58), our results are qualitatively similar to AGN. We find that the estimated tax elasticity for manufacturing capital has increased over our time period and that the difference between the two estimates is about unity (and is statistically significantly different from zero).

financial subsidiaries is twice the magnitude of AGN's estimate for manufacturing subsidiaries).

5. Conclusions

The provisions of the Tax Reform Act of 1986 which eliminated deferral of U.S. taxes on financial services income earned abroad offer an opportunity to examine the extent to which anti-deferral rules influence the location of assets held abroad in financial affiliates of U.S. firms. At least two questions are of interest. First, did the 1986 rules decrease the sensitivity of asset location to variation in host-country tax rates? Second, did the effective tax increase on U.S. financial services firms operating in low-tax jurisdictions reduce the market share of U.S. firms in those jurisdictions? The first question addresses the economic efficiency question of capital export neutrality; the second question is concerned more with competitiveness.

This paper focuses on the first question. Using data based on U.S. multinational firms' tax returns for 1984, 1992, and 1994, we find that, while reported assets of financial services subsidiaries were responsive to cross-jurisdictional variation in effective tax rates prior to TRA'86, that responsiveness disappeared after the passage of the Act. This stands in contrast to the pattern AGN estimate for the mobility of capital in manufacturing subsidiaries. Our findings suggest that the Act's provisions achieved the goal of moving the tax treatment of financial services firms closer to capital export neutrality.

Additional research is required to study the second question. The data requirements for such an analysis are significant owing to the need to study market shares in a well-defined financial product or service in a given country or set of countries by multinationals headquartered in the United States and elsewhere. This research will shed light on the cost to U.S. financial services firms of the shift toward capital export neutrality embraced in the 1986 Act.

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Appendix A. Variable means and standard deviations (32 countries)

	Number of observations	Mean	Standard deviation
Log(Total assets)	96	21.887	2.220
Log(1−ETR)	96	−0.191	0.143
Log (GDP)	96	4.722	1.686
Log(1−ETR)×Year84	96	−0.092	0.167
Log(1−ETR)×Year92	96	−0.046	0.080
Log(1−ETR)×Year94	96	−0.052	0.097
Log(1−ETR)×Year90s	96	−0.098	0.105

Source: International Monetary Fund (1984, 1992, 1994) and Internal Revenue Service.

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