

**New Developments in the Effect of Taxes on Royalties
and the Migration of Intangible Assets Abroad**

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I. Introduction

In a front page article of the Wall Street Journal on November 7, 2005, Glenn R. Simpson describes the way that Microsoft's four-year old Irish subsidiary, Round Island One Ltd., allows the parent company to save at least \$500 million in taxes each year. By licensing its software for use in Europe, the Middle East, and Africa through the Irish subsidiary, Microsoft receives royalty payments that are deductible in high-tax locations and subject to a low rate of corporate income taxation in Ireland. Because the earnings are retained abroad, they are not subject to a residual U.S. tax. According to company filings with the Securities and Exchange Commission, Simpson reports that other technology companies are following a similar strategy to reduce their overall tax burden.

Such reports are an indication of major changes over the past ten years in the tax planning strategies of U.S. multinational corporations (MNCs). These changes have affected the likelihood that a U.S. parent will receive royalties from its foreign affiliates or that the parent will be able to increase its earnings abroad from exploiting intangible assets that it develops in the United States. Additionally, U.S. parents have found new ways to accomplish the relocation or migration of intangible assets abroad. These new strategies have implications for the way the return to U.S. research and development (R&D) is reported to the Internal Revenue Service (IRS), as well as any incentive to relocate innovative activity outside of the United States. This paper explains key elements of those strategies and examines how they appear to have influenced measures of MNC activity reported by the Treasury, the Bureau of Economic Analysis, and the National Science Foundation.

The most important new tax planning development is the widespread use of hybrid entities. These are operations that are classified as incorporated subsidiaries by one country and transparent branches by another. Their use was greatly simplified by the issuance of the ‘check-the-box’ regulations by the IRS in 1997. They are important because they can make inter-subsidary payments invisible to the U.S. Treasury and therefore beyond the reach of the anti-abuse Controlled Foreign Corporation (CFC) provisions in subpart F of the Internal Revenue Code.

Thus, for example, a parent can capitalize a hybrid entity in a tax haven with equity and then have it lend to an operation in a high-tax location. The multinational company can report to the high-tax jurisdiction that the tax haven affiliate is a corporation while it elects to tell the U.S. Treasury that it is an unincorporated branch of the high-tax subsidiary. The high-tax subsidiary receives a deduction for the interest paid to the tax haven, but it is all one consolidated company to the United States. The income can therefore be deferred in the tax haven. Without the hybrid, a payment to a tax haven finance subsidiary would be subject to current U.S. tax under the CFC rules. Altshuler and Grubert (2005) calculate that these types of structures allowed U.S. multinational companies to lower their foreign taxes by \$7.0 billion per year in 2002 compared to 1997.

The significance of hybrid entities in the current context is that they can be a tax saving vehicle for transferring intellectual property abroad. A tax haven entity can engage in a cost sharing agreement with the parent in which it shares in the cost of an R&D project in exchange for the right to exploit the technology abroad. Once the technology is developed the tax haven company can license an operating sibling in a high-tax location. The deductible royalty paid to the tax haven can be ‘hidden’ from current U.S. tax by the hybrid structure. Companies have apparently been able to

arrange favorable cost sharing agreements that permit them to leave abroad in a low-tax location a greater share of the return to the U.S. R&D. If that strategy is widely adopted, the growth in royalties received by U.S. parents can be expected to decline, and greater earnings retained in the tax haven company will grow more rapidly. Other possible hybrid structures also can be expected to result in fewer royalties reported by U.S. affiliates and lower effective tax rates on income retained abroad.

In addition to those changes in the way affiliate operations are reported, the popularity of cost sharing agreements combined with hybrid structures also suggest that there will be an increase in payments for technical services by U.S. subsidiaries to their parents relative to royalties. In the long run, however, the sum of these service payments should decline relative to foreign direct investment income abroad as more of the return to U.S. intangible assets is in the form of net income deferred abroad in low-tax locations.

Those predicted effects can be assessed empirically at two levels, one using data aggregated to the country or worldwide level, and one examining firm-specific practices. Verifying whether the determinants of affiliate royalty payments have been affected by this new tax saving strategy is relevant in addressing a potential policy issue in tax reform. In November 2005, the President's Advisory Panel on Federal Tax Reform recommended two possible reform plans. One was termed the Simplified Income Tax, whose provisions in the international area would exempt from U.S. tax any dividends received from active business income abroad. Such a change is likely to reduce royalty payments made to U.S. parents because royalties would continue to be fully taxed.

The remainder of the paper proceeds by first providing a fuller explanation of hybrid structures, and then assessing whether their influence can be demonstrated in the relative importance of payments from foreign affiliates to U.S. parents.

II. Alternative Ways of Utilizing a Hybrid Structure to Affect Payments for Technology

The example given in the introduction, where a finance affiliate located in a low-tax country claims for U.S. tax purposes that a related affiliate in a high-tax country is its branch, results in an outcome where the U.S. Treasury regards them as one consolidated entity. Figure 1 shows such a hybrid structure, which allows the low-tax affiliate to strip out income from the high-tax affiliate through interest payments that are a deductible expense in the high-tax country. From the perspective of the high-tax country, less income will be declared by the affiliate that operates there, and the host government will collect less tax revenue.

Similar benefits may arise under other hybrid structures, although the way such benefits will be reported to the U.S. Treasury changes. For example, an affiliate in a high-tax Country A may claim for U.S. tax purposes that a related affiliate in a low-tax Country B is its branch, and therefore the latter entity becomes invisible to the U.S. Treasury. If the high-tax affiliate in Country A pays a royalty to the low-tax affiliate in B, it is not recognized by the U.S. Treasury. The consolidated net income of the high-tax affiliate rises because the royalty is deducted against a high tax rate, but the higher income now earned by the low-tax affiliate can be retained in B and need not face the higher tax rate in A. The Country A affiliate appears more profitable because the tax burden on a given dollar of income now is lower.

In the case of R&D cost sharing agreements, a key issue is the basis on which the affiliate is allowed to “buy in” to successful research carried out by the parent. If a parent’s latest innovation builds on several previous generations of research, but the affiliate is able to pay a favorable price that places little value on those past expenditures, the strategy is particularly successful in allowing a migration of the intangible asset to the location abroad. New proposed regulations under the cost sharing provisions of Section 482.7 of the Internal Revenue Code (Reg-144615-02 announced for public comment on August 29, 2005) are intended to address the “inappropriate migration of intangibles.” Initial reaction to these proposed regulations suggest that they represent a major revision, which is more likely to require that such agreements reflect a price that would be offered in an arms-length transaction to an investor who bore none of the risk of the earlier product developments. Current royalty rates to unaffiliated parties are not necessarily a useful guide, because they apply only to a current transaction to use a technology to make and sell a product but do not include future development rights based on that technology. Under the more favorable terms currently allowed, a smaller ownership share of successful technological innovations is retained in the United States, and fewer royalties will be received by the parent in the future. While payments from the affiliate for technical services under the cost sharing agreement will result in an initial increase in parent receipts, over the longer run the parent will receive fewer payments for the utilization of its intangible assets abroad either in the form of royalties or in the form of cost sharing payments.

III. Indications of the Changing Importance of Royalty Payments at the Aggregate Level

U.S. Treasury Data

As indicated above, the U.S. Treasury receives tax returns from U.S. controlled foreign corporations, which provide information about royalty payments, payments for technical services, and CFC earnings. Table 1 is based on compilations of information from the Form 5471, which is filed with the basic corporate return and reports on each controlled foreign corporation's transactions with its related parties. The table compares the values reported in 1996, before the "check-the-box" regime was adopted, and 2002. The latter year is the latest one for which data are available, and because some of the hybrid arrangements and cost-sharing agreements described above may take time to design and implement, a longer time frame generally is desirable to allow more complete adjustment to these new tax saving opportunities. Over a longer time frame, however, the actual response observed may be affected by other policy changes or by changes in the business cycle. For example, due to the economic downturn that occurred in many parts of the world in 2002, the likely shift in affiliate earnings relative to royalty payments may be less pronounced than in years that represent comparable stages of the business cycle.

The summary measures in the top portion of Table 1 indicate how income for all affiliates has changed relative to the income declared in seven major low-tax countries. The share of earnings in the latter group grew much more rapidly than total earnings and profits of all U.S. subsidiaries, as shown on lines 1 and 2. Although part of the increase in low-tax countries is due to the growth in dividends received from other CFCs (not hybrids), shown on line 3, the remaining portion shown on line 4 reflects increased real activity and the effect of tax planning structures that leave the visible

affiliate in a low-tax country. That figure increases at double the rate of the overall growth in affiliate income, an outcome consistent with the tax saving strategies outlined above.

Lines 5 and 6 show further evidence of hybrid structures in which the high-tax company disappears from the perspective of the U.S. Treasury. The rate of growth in tangible capital in five low-tax countries that serve as attractive locations for holding companies is over six times as great as for the total of all CFCs. Tangible capital reported in these 5 countries represents about 18 percent of the total in 2002. However, the tangible capital need not be physically present in those countries, because it instead can be located in the invisible branch in a high-tax country.

The bottom three lines of the table are based on transactions among related parties reported by the 7500 largest CFCs. Of the three measures shown, payments to U.S. parents for technical and management services grew most rapidly, by 108 percent, a likely indication of the rising importance of cost sharing agreements. Earnings and profits grew less than royalties paid to the parent, 41 percent compared to 68 percent, a somewhat unexpected result if the combination of a hybrid and a cost sharing agreement makes royalty payments from high-tax affiliates invisible to the U.S. Treasury. To put this observation in perspective, however, consider two factors that are more supportive of the hybrid strategy's importance. First, the relative ranking of royalties and profits for 2002 may result because earnings are more cyclically volatile than royalties, and 2002 was a year in which earnings and profits declined from their 2000 peak. By way of contrast, royalties grew less rapidly than earnings over the period 1996-2000. Second, between 2000 and 2002 the Treasury data show that royalties received by U.S. parents increased 29 percent, whereas the BEA's international transactions figures indicate that royalties received by U.S. parents only grew by 5 percent between

those same years. Such ambiguities suggest the importance of considering multiple data sources to indicate MNC responses to the changing tax incentives.¹

Bureau of Economic Analysis data

The Bureau of Economic Analysis publishes two important sources of data on affiliate operations. One is the Annual and Benchmark Surveys of Direct Investment Abroad, which present financial and operating data of foreign affiliates, with greater detail available in the case of majority owned affiliates (MOFAs). These surveys also offer the advantage that information is collected for each affiliate, regardless of whether it operates as a branch or is incorporated in the foreign country. Thus, in contrast to the Treasury data, the disappearance of affiliates under a hybrid arrangement should not occur in the BEA data. Nevertheless, care is warranted in interpreting these data, too, because certain measures of affiliate activity, such as net income, may appear overstated due to double counting.² If net income is likely to be overstated, but royalties are not, then comparing the percentage changes in each of these items will not be a valid test of the firm's response to the tax incentives identified above.

¹ A further example of the difference between Treasury tax data and BEA data comes from looking at total royalty payments reported by U.S. corporations on Form 1118, the basis for claiming a foreign tax credit. In 2000, firms claimed royalties of \$75 billion. In the BEA international transactions data, total royalties received by all U.S. residents was \$43 billion. MNCs may have a bigger tax incentive to characterize payments received from abroad as royalties, because that increases the foreign source income they receive and thereby increases the foreign tax credits they can claim (see Mutti and Grubert 1995 for discussion of the effects of different source rules).

² See Borga and Mataloni (2001), and Altshuler and Grubert (2005) for presentation of this issue. Altshuler and Grubert were interested in how much tax saving was possible through the growth of payments that presumably were deductible in high-tax locations.

For example, if a MOFA in country A receives a dividend from a MOFA in country B, the U.S. parent will report the affiliate's earnings in Country B and also the remitted dividend as part of the income of the affiliate in Country A. The sum of income across all MOFAs will appear larger because of this double counting. As holding company operations expand, and fulfill the role of the Country A MOFA in the example above, the potential double counting becomes larger. While the trend toward greater use of holding companies can be observed from the 1980s onward, the shift from 1996 to 2004 is particularly large. As reported by Koncz and Yorgason (2005), the portion of the U.S. direct investment position abroad that they account for has roughly doubled, from 17 percent to 34 percent.³

By way of contrast, the direct investment position data calculated by BEA come from the U.S. international transactions accounts, which consider only the transactions of foreign affiliates with their U.S. parents. The direct investment income figure that follows from this approach does not include the double counting that can occur with the financial and operating data, because it is based on U.S. ownership and does not consider transactions among affiliates.

Those observations serve as useful background to interpret alternative measures of the operations of foreign affiliates reported in Table 2. The table shows relevant data by which to assess changes in earnings and royalties from benchmark surveys from 1989, 1994, and 1999. Annual survey data are available for 2003, but those data do not provide a complete representation of transactions

³ Luxembourg has been a particularly attractive location, because it exempts from corporate tax the dividends, interest and royalties received from a foreign source by the holding company. Exemption systems more typically do not tax dividends received from abroad, because they have borne a corporate tax in the host country, but do not exempt payments that were deductible abroad.

among affiliates. The royalty payments and other private direct investment service payments for that year are taken from the international transaction accounts.

First consider the implications of the changes observed from 1994 to 1999, the benchmark years that span the introduction of the “check the box” opportunity. Then examine whether those trends are reinforced by additional responses to those incentives in the subsequent 1999-2003 period or whether other factors that operate over that period offset the initial responses observed.

The BEA data indicate that royalties paid by affiliates grew at a rate faster than most other indicators of MNC activity, such as sales, gross product, employment, and R&D, over the 1994-99 period, but not as fast as payments for other private direct investment services. Comparing royalty payments to affiliate income requires careful attention to the distinctions raised above, and therefore two measures for income are included in the table. The first is based on the sum of before-tax income reported by all MOFAs (which can include double counting described above). The second is based on the direct investment return to U.S. ownership (which should be free from the double counting described above) adjusted upward by the amount of foreign income tax paid. The increase in the former figure is particularly large, probably a reflection of the growth of holding company operations. The increase in the latter figure is slightly greater than that of royalty payments in the 1994-1999 period that spans the introduction of check the box.

To give greater insight into the conflicting forces that influence the royalty figure, note that in the earlier 1989-1994 period royalties grew quite rapidly at a time when the growth in income was very slight. The opportunity to receive royalties free of any residual U.S. tax occurs when the U.S. parent has excess foreign tax credits, and it is likely that the higher average host country tax rates in

this earlier period resulted in more parents with excess credits, creating a greater incentive to pay royalties. While the U.S. Tax Reform Act of 1986 reduced the U.S. corporate tax rate from 46 percent to 34 percent, and caused an initial increase in the share of U.S. parents that were in excess credit positions, that initial consequence was not a permanent change, because companies adjusted the types of payments they made and host countries reduced their corporate tax rates (Grubert, Randolph, and Rousslang 1996). Nevertheless, the incentive to pay additional royalties continued to operate in the decade of the 1990s, because the regulations that specified what royalty methods could be used under the provisions of 1986 act were not finalized until 1994. That standard was more stringent than existed prior to 1986. Also, in 1993 penalty regulations were adopted, which applied if royalties were understated. In short, there were several policy changes that could be expected to increase royalty payments over the 1989-94 period.

While the rate of increase of royalty payments by affiliates to parents was slower in the 1994-99 period, the growth rate of payments to other affiliates increased sharply. Relative to the royalties paid to the parent, the proportion to other affiliates has risen from 15 percent to 25 percent. This pattern is consistent with the rising role of hybrid structures. In addition, parent receipts of other direct investment service payments rose faster than royalties, 75 percent versus 50 percent from 1994-1999. The larger increase in direct investment service payments is a pattern consistent with the rise of cost sharing agreements and the Treasury data.

A particular advantage of the BEA data is that they show distinctions by country of origin of these payments by affiliates. The summary figures in Tables 3 and 4 demonstrate that the pattern of royalty payments is sensitive to tax incentives. From 1994 to 1999 a particularly large increase

occurred in royalty payments from affiliates in Ireland and Singapore. In the case of Ireland, over the earlier five-year period (1989-94), its share of all royalties received by U.S. parents from their MOFAs rose from 2.2 percent to 5.1 percent, but in the more recent period (1994-1999) that proportion increased to 15.0 percent. In the case of Singapore, the corresponding changes were from 1.6 percent to 3.2 percent and then to 4.6 percent. This pattern suggests that U.S. parents have found it profitable to locate intellectual property in low-tax countries, and from the additional revenue received there to pay additional royalties to the U.S. parent. This strategy will be particularly attractive if only a portion of the additional revenue is paid to the U.S. parent, and the rest is retained in the low-tax country. In the case of Ireland, royalties as a share of net income more than doubled from 1989-1994, but then only increased slightly from 1994 to 1999. In 1994 the ratio of before-tax income per dollar of sales, net of earnings from equity investments in other foreign affiliates, was more than three times higher for Irish affiliates than for the average across all affiliates, a sign that U.S. parents already had found it attractive to shift profits to Ireland before the advent of check the box. That differential did not increase between 1994 and 1999, but a substantial increase in the absolute amount of profits occurred, again independent of any increase in equity income the Irish affiliate gained from other foreign affiliates: before-tax profits, net of equity income in other affiliates, more than trebled in Ireland, compared to a 73 percent increase for all affiliates. For other direct evidence of the operation of hybrids, note that royalty receipts from high-tax countries such as France, Germany or Japan have either declined or grown at rates much slower than the average. Those affiliates may still be paying royalties commensurate with their expanding sales, but they are not paying them to the U.S. parent, a consequence of hybrid structures being created.

In the case of royalty payments from one MOFA to another, disclosure limitations mean that the large increase in payments to other MOFAs cannot be assigned to specific countries. More rapid growth in payments from high-tax countries might be expected on average, but that prediction may not necessarily be borne out, because such a comparison ignores the excess foreign tax credit position of the parent firm receiving the payment. Disclosure limitations also make it impossible to show whether the largest increases in royalties received occurred for affiliates in low-tax countries. The fact that there are such disclosure problems for Ireland does seem surprising, given the anecdotal evidence cited at the outset over the number of companies establishing affiliates there.

Regarding the rapid increase in payments for other direct investment services (such as cost sharing agreements), the receipts by U.S. parents do not show the same dominant position for Ireland and Singapore as appeared in the case of royalties received by U.S. parents. Payments from those countries did grow at an above-average rate from 1994 to 1999, but the current values still represent a small share of the total. Note, however, that the combination of cost sharing agreements and hybrids means that a location such as Ireland or Singapore, where real production occurs, is no longer necessary to relocate intangible assets. A cost sharing agreement with an affiliate in the Cayman Islands, for example, which then licenses a branch in Germany to produce using the technology acquired, will accomplish the desired migration of the intangible to a low-tax location. Consistent with that new opportunity, payments from holding country destinations such as the Netherlands and Switzerland hardly rose at all.

Cost sharing agreements take time to design and implement, and the 1994-99 observation period may simply not allow enough time for this influence to be more significant than the other

determinants of such activity. Extending the observation period, however, may introduce other confounding factors, beyond the question of cyclical performance mentioned above. In the Table 2 observations for 1999-2003, the item that stands out most sharply is the growth of direct investment income. Over that same period, the share of foreign earnings distributed to U.S. owners steadily fell, from 49 percent in 1999 to 30 percent in 2003 and 22 percent in 2004. While such a strategy is consistent with the incentives explained above, the trend undoubtedly was influenced by expectations of a change in U.S. tax law that would treat such retained earnings more favorably. Such an opportunity arose in 2004 when the U.S. Congress phased out the Extraterritorial Income regime for taxing export income, given unfavorable rulings against it by the dispute resolution panels of the World Trade Organization. Congress passed the American Jobs Creation Act, which also reduced the U.S. tax rate on qualifying dividends from MNC operations abroad for a period of one year from the statutory rate of 35 percent to the 5.25 percent. Preliminary figures for 2005 indicate that slightly more than the entire direct investment earnings for that year were repatriated, resulting in a reduction in the amount of retained earnings abroad. At the same time, payments to U.S. parents in the form of royalties and other direct investment services both rose less rapidly than other measures of affiliate activity, such as gross output, sales, or property, plant and equipment. These large changes in MNC behavior demonstrate why there is a limited window over which aggregate responses can be expected to reflect a dominant role for cost sharing agreements and hybrids alone.

BEA and NSF Measures of Research and Development

A final issue to address at the aggregate level is the possible role of tax considerations in the location of R&D. The tax incentives for shifting R&D abroad are not straightforward, however. In a high-tax location the R&D would receive a valuable current deduction, as in the United States, but any income, including royalties, would be subject to the same high tax. If the company had reason to believe that the R&D project was likely to be very profitable, it might locate it in a tax haven because the value of the current deduction would become less important. This could be combined with a hybrid structure to facilitate the payment of royalties to the tax haven. On the other hand, the cost sharing structure described above may make the actual shift of R&D unnecessary.

The BEA measures of R&D performed by affiliates and by parents are reported in Table 5. The ratio of these two values is shown for two different measures, one on line three based on the published figures measured in U.S. dollars at current exchange rates, and one on line four based on an adjustment of the numerator to take account of changes in the real exchange rate that may affect the amount of research that can be performed for a given dollar expenditure. (See, for example, NSF, *National Patterns of Research and Development Resources: 2003* for a discussion of this issue.) The first set of figures suggests a small increase in the proportion of research activity carried out by affiliates. The adjustment for PPP indicates that this increase has been somewhat larger, because the dollar was undervalued in 1994 compared to 1999. In that situation a given foreign currency expenditure in 1994 translated into more dollars and a higher ratio of affiliate effort on line three, even though the real amount of R&D work accomplished was not correspondingly larger.

The BEA data allow some breakdown of these figures by country by broad industry categories. Two groupings are shown in Table 5, one that reports R&D performed by affiliates in the four most

important sites (France, Germany, Japan and the United Kingdom), and one that reports R&D performed in six low-tax countries (Luxembourg is excluded from the group used in Table 2, because in most years this entry cannot be disclosed). The share accounted for by the top four countries shown on line six has dropped, as R&D efforts of U.S. firms have been dispersed more broadly across the globe. At the same time line eight shows that there is no marked increase in the share of R&D performed in low-tax countries, which would have been more likely if U.S. firms found that was the best way to ensure future innovation of highly profitable ideas could be attributed to affiliates in such low-tax countries. The absence of such a response suggests that U.S. firms have found other ways to shift intangibles to those countries, such as the combination of hybrids and favorable cost sharing agreements, which are more effective than carrying out R&D in countries that lack appropriate infrastructure or have limited personnel available to carry out such work.

The annual National Science Foundation surveys give the share of total industrial R&D performed abroad by U.S. companies. The value for R&D abroad is smaller than the BEA number reported above, and the value for R&D performed domestically is higher, given that it is not restricted to the value performed by U.S. corporations that have foreign affiliates. Therefore, the ratios calculated here are lower than those from the BEA calculated above. Figure 2 shows the comparable ratios for unadjusted and PPP-adjusted R&D effort by affiliates abroad relative to domestic R&D based on these data. The unadjusted series is quite volatile and exhibits no clear trend. The adjusted series is much more regular, and the trend line suggests that if the initial value

of the series is 8.6 percent, the annual increase in this value will be slightly less than a tenth of a percentage point.

The NSF data offer a limited breakdown by the country where the R&D is performed. Although no geographic detail was provided in 1994, information is given in 1995, which can be compared to similar information in 1999 to examine whether the patterns in this compilation mirror the trends shown in the BEA data. A somewhat different picture emerges, because for the same four large countries, their share of the total actually rises over the time that check the box was introduced, from 41 percent to 43 percent. Such a pattern again indicates that other strategies to promote the migration of intangibles must be more attractive.

IV. Returns to Intangibles and Affiliate Payments at the Firm Level

Prior research at the country level indicates that the location of real capital became more sensitive to host country tax rates in the 1990s than it was in the 1980s (Altshuler, Newlon and Grubert 2001). Does a similar result hold for intangible capital in the more recent decade? Because measuring intangible capital is not straightforward, this paper attempts to measure such an effect through the examination of affiliate royalties, cost-sharing payments and earnings and profits, based on firm-level, tax return data accessed at the U.S. Treasury Department. A cross section of all foreign manufacturing affiliates in 1996 and 2002 provides the basis for comparing how the determinants of these payments have changed across years when a major change in tax policy occurred. This analysis does not suggest new theoretical approaches in explaining affiliate earnings

and repatriations. Rather, standard models in the literature are applied to the data available for the two years identified above. The focus is not on the absolute size of the coefficients obtained, but instead on the *relative* importance of variables that determine affiliate earnings and payments to parents for royalties and for technical services.

In contrast to the country aggregates presented above, a particular advantage of the firm-specific data is that it is possible to control for characteristics of the parent firm and the affiliate when observing the affiliate's transactions. Additionally, because parent firms report the earnings and profits (E&P) of each affiliate, and the E&P calculation is based on income as defined in the U.S. tax code, not the host country, making comparisons across countries is more straightforward in this data set. Aside from the benefits of consistency, the E&P measure is an approximation of financial book income. The Form 5471s filed for each affiliate and the related parent corporate tax return, Form 1120, are the basis for the firm level analysis.

With respect to important parent characteristics, a prime goal is to accurately represent the intangible assets that a parent has developed. Expenditures for advertising and R&D are two potentially important measures. The R&D measure comes from the research and experimentation tax credit claimed by the U.S. parent. This credit is restricted to research expenditures made within the United States, and the tax code specifies the ways in which such expenditures must differ from routine product maintenance and production. The parent's R&D intensity, measured as a share of sales, indicates its ability to contribute valuable technology to the affiliate. This ratio, which is based on parent sales rather than assets, is generally more appropriate because it avoids errors in measurement caused by the valuation of assets at their historical book value. In examining the

determination of affiliate earnings and profits, however, affiliates that have high asset to sales ratios will likely earn greater profits per sale. Therefore, the models estimated control on that variable, too.

Table 6 presents estimates based on such data from 1996. In addition to the two parent characteristics that indicate the likely magnitude of intangible assets, two dummy variables represent the age of the affiliate. Younger affiliates might be expected to show a lower rate of return than those that are better established, although this influence of age may be offset by more recent aggressive strategies to locate intangibles in attractive tax locations. A key point to observe is that in 1996 the return abroad to the exploitation of U.S. R&D appears to favor the U.S. parent, because the coefficient for the parent R&D per dollar of parent sales variable is 25 percent greater in the equation estimated to explain royalties per dollar of affiliate sales than in the equation to explain earnings and profits per dollar of affiliate sales (0.70 compared to 0.56). In the 2002 data the comparable coefficient in the royalty equation is now only 60 percent of the value obtained in the earnings and profits equation (0.24 compared to 0.42). A larger share of the gain from parent technology appears to be received abroad, where it can be retained free of U.S. tax, rather than being remitted to the U.S. parent.

Also noteworthy is the importance of the parent R&D variable in the regression for technical service payments, an indicator of cost sharing agreements. If those payments are compared to royalties, the coefficients in the 1996 estimates indicate twice as great a role in determining royalty payments (0.70 compared to 0.35), whereas in 2002 those proportions had nearly reversed, with the coefficient in the cost sharing equation now appearing much larger (0.25 compared to 0.42). While that comparison may appear exaggerated because of the major change in importance of parent R&D

in the case of royalty payments, a similar comparison with the estimated coefficient from the equation for affiliate earnings and profits shows the rising importance of parent R&D as a source of cost sharing payments across these two years.

These results are consistent with what the hybrid plus cost sharing strategy suggests. A potential concern may be that the simplified model used to estimate the relevant coefficients for the three different dependent variables may be distorted by omitted variable bias.⁴ To address important aspects of that concern, consider the additional estimates reported in Table 7.

The royalty equation shown in column two includes two additional variables important in tax planning strategies, the host country's statutory tax rate and the parent's overall foreign tax rate on dividend income received (as calculated from its Form 1118 to claim a foreign tax credit). The role of the statutory rate is ambiguous. To review the comments made earlier in the paper, a parent may have an incentive to pay high royalties from a high-tax host country to benefit from the fact that they are a deductible expense. Yet, a parent may choose to locate valuable intangibles in low-tax countries in order to benefit from the low taxation of its profits, and even if the affiliate does not pay an arm's length royalty, total royalty payments may be higher from a low-tax country. The latter effect seems to dominate, because the coefficient on the statutory tax rate is negative.

Firms are more likely to pay royalties when they can be shielded from taxation in the United States. The foreign tax rate paid or deemed paid on dividends received from foreign affiliates is a potential indicator of a parent's likelihood of having excess foreign tax credits that would eliminate a

⁴ Another concern may be the fact that many affiliates make no royalty payments, and these zero values may make OLS estimates less desirable than tobit estimates that take into account this truncation of values at zero. A tobit specification,

residual tax due on repatriated royalties. Royalties, which are deductible abroad and only bear a (usually low) withholding tax in the host country, can absorb excess credits originating with highly taxed dividends. In the past, about 75 percent of royalties have been shielded by credits. The positive coefficient on this variable is consistent with tax optimizing behavior of U.S. firms, as a higher tax rate applied on foreign dividends creates a larger shield to receive royalties.⁵ These tax planning variables are of interest in their own right, but the key point to observe is that while adding them to this regression does raise its overall explanatory power, the coefficient for parent R&D is hardly affected at all

In the case of payments for technical services, a particularly noteworthy extension is to consider whether certain host countries have been more likely to attract such activity. Country dummies are included to represent low-tax countries where future product development could take place (Ireland and Singapore), as well as tax havens where the most important motive would appear to be the migration of existing intangibles (Bermuda, the Cayman Islands, and Luxembourg). While such dummies were not significant in 1996, in 2002 the coefficients for Ireland and for Bermuda, the Cayman Islands, and Luxembourg (the pure tax havens) both were quite significant. The importance of Ireland substantiates the anecdotal evidence cited in the introduction to the paper. The importance of the pure tax havens suggests that the amount of real activity expected in the host country need not be great, and a shift of R&D activity out of the United States need not be made in order to

however, forces the same explanatory variables to determine which affiliates pay a royalty and how much that royalty will be. In prior work Grubert (2001) did not find major differences between the OLS and Tobit estimates.

⁵ While this tax variable may not be pre-determined entirely independently of a firm's planned royalty payments, it is a better exogenous variable than the ex poste excess credit position of the parent.

accomplish the migration of intangibles. Those patterns appear both in the column four results based on all affiliates (not just those in manufacturing) and in the column five results based on just those affiliates in manufacturing. In the latter case, however, the role of activity in the pure tax havens is particularly large. Again, including the dummies adds to the explanatory power of the estimated equation, but it has little effect on the importance of the parent R&D variable.

V. Conclusions

Substantial migration of intangible assets from the United States to foreign countries appears to have occurred over the last decade. That trend has been facilitated by the ability of U.S. firms to create hybrid entities in their affiliates abroad and to reach favorable cost sharing agreements with them. This strategy was particularly encouraged by the U.S. adoption of “check-the-box” regulations in 1997, which resulted in inter-subsidary payments between affiliates incorporated in one foreign country and their branches operating in another foreign country becoming invisible to the IRS.

Evidence of its effect shows up in terms of more rapid growth of earning and profits in foreign affiliates relative to the royalties they pay to U.S. parents, as companies have an incentive to retain profits abroad in low-tax countries where they can avoid any residual U.S. tax. Also, payments by affiliates to U.S. parents for technical services, as would be called for under cost sharing agreements, have increased rapidly. In the process of certain affiliates becoming invisible to the U.S. Treasury, affiliates in low-tax countries with little potential to produce goods and services now claim major

increases in their plant and equipment, presumably a reflection of the capital held by their branches in high-tax countries.

BEA data, which retain the identity of individual establishments even if they are part of a hybrid structure, show double the growth of royalty payments from one affiliate to another compared to the growth in royalty payments to the U.S. parent. Such a trend might not be so surprising if there had been a major shift in R&D out of the United States to low-tax locations abroad, but evidence from the BEA and from the NSF especially suggest that this has not occurred.

Analysis of firm-specific data from the U.S. Treasury demonstrates how changes in the returns to parent R&D have shifted from the years before “check-the-box” was adopted and from the subsequent years. In regression analysis with 1996 tax returns, parent R&D contributed more to royalty payments to U.S. parents than it did to affiliate earnings and profits. In 2002, however, the importance of parent R&D had switched in these two regressions, with it now playing a larger role in earnings and profits relative to royalties. Also, the relative importance of cost sharing payments rose over this period, relative to both royalties and earnings and profits. Cost sharing payments from affiliates in Ireland and from pure tax havens (Bermuda, the Cayman Islands, and Luxembourg) are particularly significant, both economically and statistically. Thus, the ability to carry out research and development in the affiliate does not appear to be a key pre-requisite for the successful pursuit of this strategy.

These trends do not suggest an immediate negative impact on U.S. tax collections, because greater cost sharing payments received by U.S. parents offset lower royalty payments. In the longer run, once these payments to buy into existing technologies have been made, then the decline in

royalties will no longer be offset by greater cost sharing payments. Another implication of the success of this strategy is that pressure to relocate research and development activity abroad for tax reasons has not been so compelling.

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Figure 1
A Possible Hybrid Structure

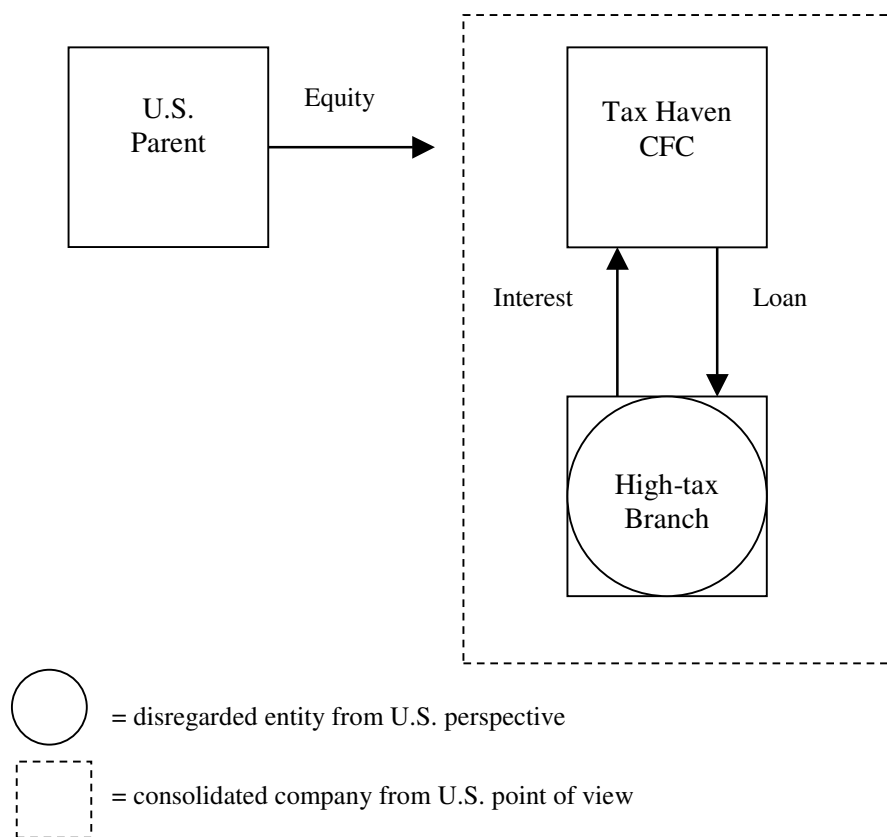


Table 1
Tabulations from the 1996 and 2002 Form 5471 Files
(in billions of dollars)

	1996	2002	Growth as %
All CFCs			
1. Total pre-tax earning and profits	\$160.8	\$228.7	42
2. Earnings and profits in seven major low-tax countries (Ireland, Singapore, Bermuda, Cayman Islands, Netherlands, Luxembourg and Switzerland.)	36.5	82.5	126
3. Dividends received in the seven major low-tax countries	6.4	25.7	302
4. Earnings and profits in the seven major low-tax countries, less dividends received	30.1	56.8	89
5. Total tangible capital (net plant & equipment plus inventories)	767.5	1,119.5	46
6. Tangible capital in five major holding company low-tax countries (Bermuda, Cayman Islands, Netherlands, Luxembourg and Switzerland)	51.7	205.0	296
6. Earnings and profits of CFCs with parents in finance in the seven major low-tax countries	5.1	5.6	10
Top 7500 CFCs			
7. Earnings and profits	139.8	196.8	41
8. Compensation for technical and management services (cost-sharing)	13.2	27.4	108
9. Royalties paid to parents	22.4	37.6	68

Source: Treasury tax files.

Table 2

Aspects of Affiliate Activity from BEA Benchmark Survey Measures(1989-94-99) and Financial and Operating Data /International Transactions Accounts (2003)							
Measure	1989	1994	1999	2003	Growth, 89-94	Growth, 94-99	Growth, 99-03
Affiliate net income before tax	105.4	110.4	207.8	396.9	5%	88%	91%
Before-tax Direct Inv. Income	86.6	87.6	145.2	247.8	1%	66%	71%
Property, Plant & Equipment	248	350	593	730	41%	69%	23%
R&D	7.0	11.9	18.1	22.3	70%	52%	23%
Gross Product	320	404	566	705	26%	40%	25%
Employees	5,114	5,924	7,766	8,364	16%	31%	8%
Sales	1,020	1,436	2,219	2,906	41%	55%	31%
Royalties	12.5	22.0	35.8		76%	63%	
Royalties to US parent	9.8	16.7	25.0	30.8	70%	50%	18%*
Royalties to Other Foreign Affiliate	1.5	2.6	6.0		73%	131%	
Other Direct Investment	7.1	11.8	20.6	27.0	66%	75%	22%*
Services to Parent							

* Based on change in international transactions accounts entries for 1999 and 2003.

Table 3
U.S. Parent Transactions with Majority-Owned Affiliates

		1989	1994	1999	2003
		Benchmark III.X.1, III.X.4	Benchmark III.Z.1, III.Z.4	Benchmark, III.AA.1, III.AA.3	International Transactions Data
Royalties,	received	9,839	16,744	25,045	30,876
Europe		6,330	10,627	d	16,784
France		984	1,428	1,777	1,639
Germany		1,159	2,019	1,950	1,873
Ireland		215	859	3,761	4,065
Netherlands		635	1,397	d	1,566
Switzerland		259	446	d	1,614
United Kingdom		1,462	1,873	2,270	2,739
Asia		2,280	3,991	5,732	8,099
Japan		1,434	2,242	2,864	3,061
Singapore		158	542	1,150	2,385
Royalties,	paid	54	368	2,200	2,550
Europe		43	270	d	1,365
France		9	26	70	193
Germany		6	43	25	d
Ireland		d	4	16	21
Netherlands		0	20	d	d
UK		25	56	151	176
Asia		7	58	170	d
Japan		1	25	73	92
Singapore		1	2	19	d
Other Direct Investment Services received		11,780	20,600	26,960	
Europe		3,981	6,133	10,143	14,016
France		235	737	1,000	1,470
Germany		431	673	1,589	1,811
Ireland		121	316	738	1,299
Netherlands		412	1,236	1,246	1,473
Switzerland		166	510	506	872
United Kingdom		1,733	1,681	3,187	4,773
Asia		902	2,167	4,369	5,641
Japan		246	554	1,220	1,893
Singapore		d	490	1,103	734
Other Direct Investment Services paid		6,477	14,939	18,992	
Europe		1,938	3,521	8,472	11,234
France		290	529	715	826
Germany		479	644	767	1,153
Ireland		d	48	335	336
Netherlands		197	186	269	536
Switzerland		74	155	233	324
United Kingdom		600	1,514	4,915	6,263
Asia		1,085	1,753	3,262	4,065
Japan		881	1,119	765	1,301
Singapore		d	152	1,025	458

Table 4

Royalties received and paid by Affiliates			
	1989, III.I.7	1994, III.J.7	1999, III.J.7
Royalties received			
Total	1,461	2,581	9,241
From affiliated persons	710	1,464	6,456
from US parent	54	368	2,200
from other foreign affiliates	656	1,096	4,256
Europe	462	799	d
France	31	45	173
Germany	44	314	725
Ireland	d	d	d
Netherlands	66	76	105
Switzerland	87	87	106
UK	117	234	928
Asia	127	254	251
Japan	d	d	65
Singapore	d	d	8
From unaffiliated	750	1,116	2,785
Royalties paid			
Total	12,472	22,039	35,846
by Europe	7,871	14,708	19,949
by Ireland	469	1,496	4,640
by Asia	2,574	4,641	8,889
by Singapore	76	555	2,844
To affiliated persons	11,327	19,358	31,073
to US parent	9,839	16,744	25,045
to other for affiliates	1,488	2,615	6,029
by Europe	938	2,153	d
France	188	118	242
Germany	130	d	725
Ireland	251	d	395
Netherlands	82	537	d
UK	127	187	578
Asia	157	249	2,216
Japan	68	105	205
Singapore	d	75	d
To unaffiliated	1,145	2,681	4,773

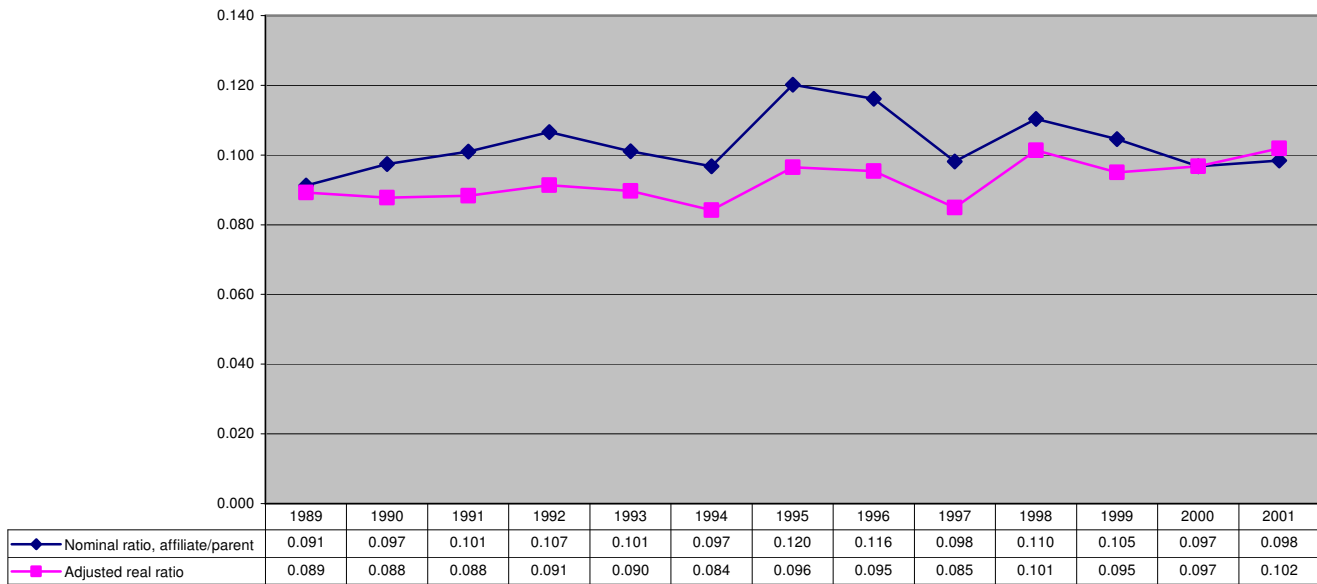
Table 5

BEA R&D Comparison, Proportion by Majority Owned Affiliates			
	1994	1999	2003
Parent	90,913	126,291	140,103
Affiliate	11,877	18,144	22,328
Ratio, Line 2/line 1	0.131	0.144	0.159
Ratio, adjusted for PPP	0.114	0.131	0.152
Six low-tax countries	1,170	1,287	1,752
Ratio, line 5/line 2	.099	.071	.078
Four major countries	7,509	10,352	11,168
Ratio, Line 7/line 2	.632	.571	.500
	III.L.1	III.M.1	SCB
Sources:	III.J.1	III.J.1	Jul-05
	Benchmark	Benchmark	p.22

Low-tax countries are Ireland, the Netherlands, Switzerland, Singapore, Bermuda, and the Cayman Islands.

Major countries are France, Germany, the United Kingdom, and Japan.

Figure 2
Compare NSF R&D Measures



Source: NSF, Research and Development in Industry, various issues, and IMF, real effective exchange rate for the United States, based on unit labor costs

Performance of R&D Outside the United States by US Companies and Their Foreign Affiliates

Location	1995	1999	2001
Total	13,052	16,765	17,869
Four major countries	5,367	7,260	5,809
Ratio, line 2/line 1	.411	.433	.325

Source: NSF, Research and Development in Industry, Table A-12, various issues.

Table 6 Determinants of CFCs Profits, Royalties, and Technical Service Payments from Form 5471, U.S. Treasury data						
	1996			2002		
	Profit/Sales	Royalty/sales	Cost share/sales	Profit/sales	Royalty/sales	Cost share/sales
Age < 5 years	0.0197 (2.27)	-0.0163 (-4.23)	0.0042 (1.41)	-0.0159 (-1.33)	-0.0023 (-0.47)	0.0310 (6.27)
Age 5-15 years	0.0215 (3.77)	-0.0041 (-1.60)	-0.0015 (-0.78)	0.0438 (4.38)	-0.0013 (-0.32)	-0.0044 (-1.07)
Parent R&D/sales	0.556 (3.45)	0.697 (9.77)	0.346 (6.25)	0.4151 (3.05)	.241 (4.66)	.4238 (7.51)
Parent Advertising/sales	0.599 (9.06)	0.0581 (1.99)	0.0613 (2.71)	1.3212 (9.01)	-0.0685 (-1.17)	-.0660 (-1.09)
Affiliate Assets/sales				0.0330 (11.03)	0.0011 (0.95)	-0.0034 (-1.11)
Constant	.0585 (14.44)	0.0088 (4.92)	0.0015 (1.07)	0.0174 (2.12)	0.0139 (4.24)	-0.0043 (-1.28)
Adjusted R square	0.062	.062	0.028	0.253	0.019	0.103
Number observations	1,640	1,640	1,640	849	849	849

<p>Table 7</p> <p>Additional Evidence of Manufacturing CFCs' Royalties and Technical Service Payments from Form 5471, U.S. Treasury data, 2002</p>					
	Royalties/sales	Royalty/sales	Cost share/sales	Cost share/sales*	Cost share/sales
Age < 5 years	-0.0023 (-0.47)	-0.0075 (-1.62)	0.0310 (6.27)	-0.0002 (-0.07)	0.0072 (1.47)
Age 5-15 years	-0.0013 (-0.32)	-0.00009 (-0.02)	-0.0044 (-1.07)	-.0058 (-2.05)	-0.0058 (-1.49)
Parent R&D/sales	.241 (4.66)	.249 (4.66)	.4238 (7.51)	0.4130 (10.64)	0.365 (6.75)
Parent Advertising/sales	-0.0685 (-1.17)	-0.095 (-1.71)	-.0660 (-1.09)	-0.0017 (-0.03)	-0.0836 (-1.29)
Affiliate assets/sales	0.0011 (0.95)		-0.0034 (-1.11)		
Local Statutory tax rate		-0.127 (-6.86)			
Foreign tax rate on dividends		0.093 (6.65)			
Ireland				0.0461 (5.73)	0.068 (5.55)
Singapore				0.0044 (0.59)	0.0030 (0.22)
Pure Tax Havens				0.0424 (9.31)	0.143 (15.71)
Manufacturing				0.0018 (0.72)	
Constant	0.0139 (4.24)	0.0316 (3.81)	-0.0043 (-1.28)	-0.0059 (-2.62)	-0.0058 (-1.95)
Adjusted R square	0.019	0.120	0.103	0.164	0.345
Number observations	849	848	848	1,393	756

* includes all sectors except financial affiliates