THE TAX TREATMENT OF RESEARCH AND DEVELOPMENT (R&D) EXPENDITURES BY MULTINATIONAL CORPORATIONS: THE IMPACT OF REGULATIONS 1.861-8

Anita M. Benvignati
U.S. Treasury Department

OTA Paper 43 December 1980

OTA papers are circulated so that the preliminary findings of tax research conducted by Staff members and others associated with the Office of Tax Analysis may reach a wider audience. The views expressed are those of the author and do not reflect Treasury policy. Comments are invited, but OTA papers should not be quoted without permission from the author.

Office of Tax Analysis
U.S. Treasury Department
Washington, D.C. 20220
Issued: December 1980

TABLE OF CONTENTS

		Page
I.	Introduction	1
II.	Regulations Section 1.861-8 and R&D Expenses	2
III.	What Does the Economic Literature Tell Us?	4
IV.	Some Alternatives	8
V.	Conclusion	12

THE TAX TREATMENT OF RESEARCH AND DEVELOPMENT (R&D) EXPENDITURES BY MULTINATIONAL CORPORATIONS: THE IMPACT OF REGULATIONS 1.861-8

Anita M. Benvignati*
U.S. Treasury Department

I. INTRODUCTION

Sections 861 and 862 of the Internal Revenue Code require corporations to allocate or apportion expenses, losses, and other deductions between domestic and foreign source income. Where deductions, such as R&D expenses, interest expenses, and stewardship expenses, cannot be definitely allocated to either source, an appropriate portion must be apportioned to each source of income. This apportionment of expenses can substantially reduce a U.S. corporation's foreign tax credit limitation, the amount of income attributable to its DISC, or otherwise result in a higher U.S. tax liability.

Early in 1977, Regulations section 1.861-8 was issued after considerable controversy and debate. The regulations detail methods to be used in assigning "not definitely allocable" expenses to foreign source income. The most controversial part of the regulations has been that dealing with R&D expenses. By denying U.S. corporations a full deduction for domestic R&D expenses against domestic income and by assigning some portion to foreign source income, where it often is not allowed as a deduction by foreign tax authorities, the apportionment can effectively deny any tax deduction for a part of R&D expenses. Corporations engaging extensively in international business or in the production of technology-intensive products may, in some cases, be subject to a significantly higher over-all tax on their worldwide income. For these reasons, large and expanding U.S.-based multinationals have opposed the new regulations.

---

* Brookings Economic Policy Fellow assigned to the Office of Tax Analysis. The author wishes to thank Thomas Horst and Emil Sunley for their many valuable suggestions. Views and opinions expressed herein should not be construed as the official position of the U.S. Department of the Treasury.

Two specific issues have arisen in connection with the apportionment of R&D expenses under Regulations section 1.861-8. First, from the point of view of sound economic policy, the question has been raised as to whether, despite potential foreign benefits derived from such expenditures, any allocation of R&D expenses should be made to foreign source income. And secondly, if such apportionments are to be made, what is the proper way to match R&D expenses against income? While the former impinges on such important matters as domestic productivity and the international competitiveness of U.S. corporations, it is the latter, more narrow topic, we seek to discuss here. Do Treasury's 1977 regulations meet the statutory requirement of properly matching R&D expenses to sources of income? Or could they be improved upon significantly?

This paper begins by outlining the methods available to corporations under Regulations section 1.861-8 for apportioning R&D expenses between domestic and foreign source income. It then reviews the economic literature on the production and dissemination of technology for the light it sheds on the proper matching of R&D expenses to sources of income. This paper concludes by examining the implications of the literature for ways in which the 1.861-8 rules could be restructured to achieve a more precise matching of expenses to income sources.

II. REGULATIONS SECTION 1.861-8 AND R&D EXPENSES

Under the existing regulations, corporations are permitted to allocate totally to their domestic income those R&D expenses incurred either solely to meet U.S. government mandates (for example, to meet an OSHA or EPA regulation) or those made jointly with a foreign entity where a bona fide cost-sharing agreement exists (which presumably already assigns R&D expenses to the domestic and foreign sources). Corporations may then select one of two methods for apportioning all remaining R&D expenses between domestic and foreign source income--the Sales Method or the Gross-to-Gross Method.

Under the Sales Method, corporations first assign an "exclusive apportionment" percentage of R&D expenses solely to their domestic income. For taxable years beginning in 1977, 50 percent of R&D expenses can be allocated exclusively to domestic source income and the remainder apportioned between domestic and foreign sources. The allowable percentage drops to 40 percent in 1978, and 30 percent for taxable years beginning in 1979 and thereafter. 1/

How did the Treasury Department justify this special allowance? Generally speaking, it reasoned that the rate of return to domestically conducted R&D is considerably higher in the domestic market than in foreign markets. This suggested that some kind of mechanism should be provided to adjust for the difference. The two specific reasons offered in the regulations are that (1) categories of products marketed abroad are frequently narrower in breadth than those marketed at home, so that domestic R&D typically has greater applicability and hence returns in the domestic market than in foreign markets, and (2) new products and processes of production are often introduced in foreign markets later than in the domestic market, which reduces the discounted value of foreign returns relative to domestic returns even when streams of additional income are otherwise identical in each location. Recognizing that the fixed "exclusive apportionment" percentage provided in the regulations may not fully compensate certain firms having either unusually narrow ranges of foreign product applications and/or unusually large foreign introduction lags, Treasury permits corporations to apply to the Commissioner of the IRS for a higher exclusive apportionment on the basis of "facts and circumstances" relevant to these two specific criteria.

After making an "exclusive apportionment" to domestic source income, a corporation must apportion its remaining R&D expenses between domestic and foreign source income on the basis of its domestic and foreign sales in 2-digit SIC product categories (or broader product groupings). Permitting the taxpayer to break R&D down into 2-digit SIC industries is an effort to fine-tune the regulations so that only closely related sales enter the apportionment formula. Other rules adopted for this same purpose are (1) the exclusion (i.e., the netting out) of intracorporate transfers of inputs from the parent operation to subsidiaries (or branches) for calculating sales of those foreign affiliates, (2) the exclusion of all sales of purely wholesale or retail foreign affiliates (since they fall into a different 2-digit SIC category from the manufacturing activity which R&D activity typically supports), and (3) the restriction of sales to no specific product grouping for apportioning basic research expenses, on the assumption that such expenditures are not directly related to any specific products or process.

As an alternative to the Sales Method, a corporation may use the Gross-to-Gross Method. R&D expenses (other than those allocated to domestic income as government-mandated or cost-sharing research) are apportioned between domestic and foreign income on the basis of gross income derived from each source. No "exclusive apportionment" or product category

breakdowns are permitted. "Gross income" for this purpose includes gross profits from a trade or business (gross receipts or sales less cost of goods sold), dividends, rents, royalties, and other income received. The amount apportioned to foreign source income using the Gross-to-Gross Method may not fall below half of what would have been apportioned under the Sales Method. Thus, the amount which would be apportioned to domestic source income under the Sales Method limits the amount which may be apportioned under the Gross-to-Gross Method.

The Gross-to-Gross Method often results in a smaller allocation of R&D expenses to foreign source income than the Sales Method when foreign operations are conducted through a foreign subsidiary rather than a branch. This result tends to occur even when "net profits" per dollar of sales are identical for the foreign subsidiary and its U.S. parent. Why? Gross income from a foreign subsidiary includes only dividends distributed to the U.S. parent and not earnings retained for foreign reinvestment. Although such dividends are "grossed-up" to include any income taxes "deemed paid" by the parent, such income is net of the subsidiary's depreciation, interest expenses, advertising costs, and other such deductions. By contrast, the gross income of the U.S. parent includes all profits, whether reinvested or not, and is gross of all expenses except the cost of goods sold. This asymmetry in the way gross income is calculated may be responsible for the Treasury Department's limiting the use of the Gross-to-Gross rule to those instances where the foreign apportionment of R&D expenses is at least 50 percent of that under the Sales Method. 2/

III. WHAT DOES THE ECONOMIC LITERATURE TELL US?

In general, the economic literature on the innovation process examines the intent of a given R&D undertaking or project, since this intention provides useful information about its applicability in different markets. One approach taken in the literature is to distinguish between basic research projects and applied or development research projects. Basic research projects are related either to no product group or only to a general group of products. For example, projects may be expected to benefit the development of chemical products or processes although specific chemical applications are not foreseen. By contrast, R&D projects classified as applied or developmental usually seek to develop specific new (or improved) products or specific new (or improved) processes of production. 3/

The distinction between basic and applied research, while drawn in the current regulations, is not handled as well as it might be. A more flexible treatment of basic research would seem appropriate since not all such projects are so general as to be related to all the corporation's endeavors. For example, a basic chemical research project is not likely to help with its overseas hotel business. This principle should be reflected in the regulations.

A second approach taken in the literature distinguishes between development projects undertaken solely in response to needs or demands of a single geographical market and those undertaken with more general geographical applications in mind. Because development projects are often efforts to improve existing products or processes rather than to develop entirely new ones (as in the case of applied research), they are typically market-specific. Furthermore, within the category, there is reason to believe from previous studies [e.g., Mansfield, 1971] that development projects seeking to make relatively minor improvements are likely to be more locally oriented than other types of development projects. Short-term projects have tended to coincide with this distinction. Where such short-term, market-specific development projects can be isolated from other domestic R&D undertakings, they could be exclusively assigned to U.S. (or, if appropriate, foreign) income, and not lumped together with remaining projects.

A final distinction made in the literature is between product and process technology. Evidence tends to suggest that domestically developed process technology earns significantly lower rates of return in foreign markets than in the domestic market. This is attributable to the greater difficulty which U.S. multinationals experience abroad in protecting process technology from imitation by competitors. 4/ This same discrepancy apparently does not exist for product technology, provided the technology is legally patented. Imitators are more visibly exposed and thwarted when copying new products since they openly present them on the market. By contrast, when they copy a new method of production, the adoption of new equipment or methods takes place within the confines of their own factory facility. Mansfield, Romeo, and Wagner [1979] discovered that for this reason corporations try to hold their process technology close to headquarters where proprietory secrets can be more effectively protected. Hence, they tend to exploit these technologies in foreign markets by exporting domestically produced goods and avoiding foreign direct investment or foreign licensing. Regulations effectively apportioning domestic R&D expenses on the basis of relative returns should reflect the difference between product and process R&D by apportioning less process R&D to foreign source income.

A distinction is also be made in the literature with regard to the type of corporation performing R&D. Firms whose international commercial activities are limited in scope or duration earn on domestic R&D distinctly lower foreign returns per dollar of foreign sales than domestic returns per dollar of domestic sales. Why? An answer is given in the economic literature on multinational corporation (MNC's)--institutions whose structural and organizational features, particularly at maturity, help them to obtain higher returns on domestic R&D in foreign markets. In its textbook version, a "mature multinational," compared to other firms, tends to (1) treat foreign markets as an integral part of its operations, (2) be more experienced in interpreting and understanding foreign needs, (3) be less hampered by foreign market information imperfections, (4) have a better established reputation and presence in foreign markets, (5) have more experience in transferring technology to foreign recipients (who often are long-established subsidiaries), (6) utilize even the simpler marketing channels, such as exporting and foreign licensing, more effectively, and (7) wield greater market power in foreign markets. As a result of these advantages, the mature multinational is able to generate more foreign income from new technology than other corporations participating in foreign markets. More specific reasons for this contention bear enumerating.

First, the experienced multinational can often introduce its new technologies in foreign markets shortly after, if not at the same time, as it introduces them domestically. This reduces income losses due to time-lags in the receipt of what otherwise would be identical income streams. Early technology-based theories of trade and investment have argued that many obstacles stand in the way of introducing new products and processes of production in foreign markets. These obstacles include the need for headquarters to be close to the market location for effective interpretation and speedy feedback of customer needs, the additional time involved to adapt new technologies to suit foreign needs, the exporting delays that may occur due to trade barriers, the time delays in gathering information and making necessary contacts to consummate a favorable foreign licensing contract, and the reluctance to set-up overseas production because of extra start-up costs often associated with such efforts or government restrictions sometimes imposed on incoming foreign direct investments.

Evidence suggests that mature multinationals can overcome most, if not all, these obstacles. 5/ Their accumulated knowledge and experience in dealing with different foreign market needs tend to minimize any difficulties they may

encounter in conducting the early stages of new commercial undertakings at a "distance" from targeted markets. Supportive overseas R&D units -- a not uncommon feature of such enterprises -- often further enhance the MNC's communications at that functional level, as well as increase the efficiency with which they can adapt new products or processes to suit local market preferences. 6/ Their long-established, local production record means their reputation is probably well known to local customers. And their start-up costs associated with foreign production are lessened, if not eliminated, by the existence of an on-going network of foreign subsidiaries which already operate at least as efficiently as local enterprises. Finally, where foreign governments restrict ownership participation in direct investment, mature MNC's are in a better position to negotiate favorable contract alternatives. These may be in the traditional form of a licensing agreement or joint-venture or in a more innovative form, such as a co-production contract, turn-key plant, or possibly even a compensatory trade agreement (as now explored with China).

A second reason for higher income potentials for experienced MNC's is that even after the first introduction of new technologies into foreign markets, these corporations are likely to face higher rates of customer acceptance of the new products or processes than the inexperienced firm. This would result in an overall higher quantity of output sold over time. Because foreign needs can be taken into account early in the R&D process, the output is likely to be more appropriate to foreign use than that of inexperienced firms. Also foreign customers will bear less risk by having direct access to the original producer for early instructional training, minor modifications needed to accommodate their own specific operating conditions, and follow-up servicing and parts. While foreign licensing may help alleviate some of the problems encountered by inexperienced firms in making their R&D output suitable for foreign use, it clearly does not serve as a perfect substitute for a local (foreign) affiliate.

A third reason for income advantages afforded mature MNC's is the lower costs associated with adapting domestic-based technologies to suit foreign needs and transfer these technologies to foreign markets. While the inexperienced firm may offset the lower level of foreign user acceptance by engaging in additional R&D to alter or modify domestic technology to accommodate foreign market conditions, it is likely to find it more expensive to do so than the mature MNC. This is so for two reasons: initial domestic configurations of technology probably deviate from the appropriate foreign configuration by a greater degree; and the firms have less

perfect information about foreign markets, which results in more trial and error in the adaptation process. In addition, inexperienced firms are likely to bear other "disembodied" 7/ technology transfer costs which the mature multinational can minimize. These include the cost of exchange and clarification of engineering and other technical information, special training of personnel to ensure effective use of the technology, and start-up testing and debugging of production. A study by David Teece [1977] indicates that such costs (which also include adaptation costs) tend to be higher, the less experienced the firm is in transferring technology, all other things equal. 8/

Finally, mature MNC's tend to face less competition in foreign markets than inexperienced firms and so have higher unit prices or "monopoly rents." In a static framework, the inexperienced firm, by virtue of the less appropriate technology it tends to offer in foreign markets, is presumed to face a greater number and/or closer substitutes for its output than at home. This decreases the firm's elasticity of demand and potential monopoly rents. In a dynamic framework, product-cycle theories of international trade and investment based on a presumption of sizable foreign introduction-lags for new technology suggest that by the time a firm makes its big push into foreign markets, a certain degree of technical standardization and knowledge dissemination has already taken place outside the firm. The original monopoly rents extracted for proprietary knowledge have dissipated with the entry by imitators and the more competitive pricing of output. Indeed, part of the incentive to explore foreign markets is presumed to be the search for cheaper locations of production in response to new competition. Since we have established that it is principally inexperienced firms that respond with the most notable time-lags, they then would be more likely to be exposed to this erosion of monopoly advantage than mature multinationals.

IV. SOME ALTERNATIVES

Since domestic R&D expenses are often not directly and unambiguously related to particular sources of income, any method of apportionment between domestic and foreign source income is bound to involve compromises. A review of the economic literature suggests there are ways in which the current regulations may be improved. The suggested revisions, described below, would result in a more precise matching of income with expenses, and at the same time a more workable and practical format for taxpayers to comply with the statutory intent.

"Net" Sales Method as an Only Option. The first suggestion is to use strictly a "net" sales basis for apportionment. Sales provide a reasonably reliable measure of long-run profitability since typically they are not volatile on a year-to-year basis. From a practical standpoint, sales figures are generally easy for firms to compile. Eliminating the Gross-to-Gross option avoids the asymmetrical problem in defining gross income discussed earlier.

"Netting-out" intracorporate transfers from total sales in a particular geographical location continues to seem reasonable since it enables a better geographical placement of real manufacturing activities, eliminates double-counting, and provides a better breakdown of the different types of foreign source income (export, subsidiary, etc.). However, "net" sales of foreign affiliates strictly engaged in wholesale or retail activities should be included as part of related product category sales since R&D which develops better products and/or cheaper methods of production presumably also benefits the marketing function of a firm.

It is possible, however, that firms should be given the option of applying a "net" sales method at a simple aggregate level or at a more complex disaggregated level (shortly to be specified). Corporations with minimal R&D or in no immediate danger of paying foreign taxes in excess of the allowed U.S. credit, for instance, may decide that the additional cost of applying a more precise method is not warranted.

Project Basis Allocation. Students of industrial R&D have long recognized that formal industrial R&D programs of private enterprise are typically organized along lines of individual projects, which management (and presumably, auditors) can easily identify and categorize by type, status of completion, and budget allocation. Apportioning R&D expenses between domestic and foreign source income on a project-by-project basis would complement existing methods of corporate accounting and hence ease the process of compliance. More importantly, it would permit a distinction to be made between the various types of research. For example, since not all basic research is targeted at the overall product level, those projects that are not may be distinguished and treated separately. Where short-term development projects exist and are expected to give rise only to domestic source income, those projects can likewise be separated. Finally, determining what research is designed principally to develop new products versus new processes so they may be treated differently, would again be best evaluated at the individual project level.

Product Category Flexibility. Restricting corporations to R&D breakdowns associated with no finer than 2-digit SIC product categories probably results in a far too inflexible method if the goal is to achieve the "best" matching of income to expenses. Many corporations are likely to find the restriction unnatural for their particular operation and method of accounting. Moreover, making strict use of 2-digit SIC categories would contradict much of the intent and benefit of allocating expenses on a project-by-project basis. A method enabling use of the most "appropriate" product categories for the corporation in question is needed. At the same time, the decision should not be a completely free-floating one for the firm, leaving IRS little or no control over the monitoring process. Perhaps corporations should be required to submit with their tax return the major and minor product categories used for the purpose of section 1.861-8 R&D apportionments--categories to be consistently applied from year to year so that some standard can then be afforded IRS while at the same time realistic product categories made available to corporations.

A New Exclusive Apportionment. Under the current regulations, the fixed "exclusive apportionment" percentage provides a mechanism to adjust for the assumed lower rate of return to domestic R&D earned in foreign markets arising from the later introduction and narrower application of new technology in those markets. If product categories used in apportionment were made more flexible, the problem associated with category discrepancies would be readily accommodated. The remaining rationale for a fixed "exclusive apportionment" appears somewhat too simplistic. Foreign introduction-lags are only a partial explanation for why a particular firm and/or research project is likely to earn lower foreign rates of return. From the literature we identified two specific circumstances justifying an assumed lower foreign rate--where the intended output of a research project is a new process (rather than new product), and where the corporation involved is internationally inexperienced. Large foreign introduction-lags are just one characteristic of inexperienced firms and should probably not be a decisive criterion for assigning an exclusive apportionment.

For process technology and inexperienced firms, then, some kind of exclusive apportionment to domestic income would be appropriate to compensate for substantially lower foreign returns expected. For experienced firms, however, only process technology should be subject to an exclusive apportionment. Operationally, new processes are probably easily identified and confirmed on a project-by-project

basis. On the other hand, a workable definition of an inexperienced firm may be more difficult to develop. As one suggestion, it might prove acceptable to define "inexperienced firms" as those with less than 20 percent of sales from foreign sources or those with R&D expenditures totaling less than 2 percent of worldwide sales. 9/

What form should the new exclusive apportionment take? It is hard to say. One simple solution would be to make an exclusive apportionment to domestic source income of 50 percent of the process and product R&D of inexperienced firms, and 50 percent of the process R&D of experienced firms. Basic research and, in the case of experienced firms, product R&D, would not be subject to exclusive apportionment but would instead be allocated between domestic and foreign source income solely on the basis of net sales. 10/ This allocation rule turns out to be equivalent to an assumption that, in the case of all process R&D and the product R&D of inexperienced firms, the return per unit of sales is twice as high in the domestic market as in the foreign market. 11/ In the case of the product R&D of experienced firms and all basic research, the return per unit of sales is the same at home and abroad. Of course, while these assumptions provide a reasonable standard, others might prove equally serviceable.

Treatment of Overseas R&D. A fairer treatment of R&D expenses might provide some allocation of foreign R&D expenses incurred by U.S. corporations to their domestic income. It could be argued that the apportionment of R&D expenses would be effectively handled by apportioning all expenses of short-term domestic development projects to "home" income. Since managers typically claim that the principal reason for establishing overseas R&D is "to respond to special design needs of the overseas market" [Mansfield, et. al., 1979], all such undertakings might easily qualify as short-term development projects whose expenses should be allocated exclusively to foreign income.

As an alternative (particularly if identifying local market-oriented development projects is a difficult matter), the Sales Method might simply be applied to a corporation's consolidated R&D. This approach, however, requires accumulating (and IRS monitoring) of detailed information on foreign R&D projects as well as domestic projects, which may lead to its own set of enforcement problems.

V. CONCLUSION

This paper has shown that distinctions made in the economic literature on R&D may suggest better ways of matching R&D expenses and income. While it cannot be said that all U.S. multinationals would stand to benefit from the implementation of the alternatives described above, many companies would find that these alternatives would permit them to allocate less R&D expenses to foreign source income and thereby achieve a higher foreign tax credit limitation.

Technical Appendix

Under the assumption that domestic and foreign returns to domestic R&D (R_d and R_f, respectively) are each linearly proportional to their respective "net" sales (S_d and S_f), then we can state,

$$R_d = a_d S_d$$

$$\text{and } R_f = a_f S_f$$

where a_d and a_f represent domestic and foreign rates of return to domestic R&D from each location. The share of total returns to domestic R&D represented by the foreign contribution is then,

$$= R_f/(R_d + R_f)$$

$$= (a_f S_f)/(a_d S_d + a_f S_f)$$

Letting total sales, i.e., $S_d + S_f$, be equal to S_t, multiplying by S_t/S_t, and rearranging terms, the above expression may be written,

$$= ((a_f S_t)/(a_d S_d + a_f S_f)) (S_f/S_t)$$

Where $a_d = a_f$ (i.e., returns to domestic R&D from each dollar of domestic and foreign sales are equal), the fraction of R&D returns derived from foreign sales is exactly the proportion of total sales represented by foreign sales, i.e., (S_f/S_t). If the argument is made that under certain circumstances the domestic rate of return is significantly greater than the foreign rate of return, i.e., $a_d > a_f$, then only some fraction of the foreign sales ratio represents the foreign contribution. By assuming a one-half allocation for process technology and for inexperienced firms, we in effect assume,

$$(a_f S_t)/(a_d S_d + a_f S_f) = 1/2$$

At the limit where $S_f = 0$, this expression reduces to:

$$2a_f S_t = a_d S_d,$$

indicating the domestic return is at least twice that of the foreign return, since $S_t = S_d$ and since this equation represents the limit at $S_f = 0$. Larger values of S_f need to be accompanied by somewhat larger discrepancies between a_d and a_f.