Federal Taxation of the Pharmaceutical Industry: Effects on New Drug Development and Legislative Initiatives in the 109th Congress

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Summary

An important consideration in the debate in Congress over expanding consumer access to prescription drugs is the forces shaping the domestic climate for the discovery and development of new medicines. One such force is federal policy. This report examines a small slice of the assortment of federal policies that affect the incentive to invest in pharmaceutical innovation: the federal tax burden on the pharmaceutical industry and legislative initiatives to modify the burden. It will be updated to reflect more recent data or significant legislative activity in the 109th Congress.

Generally, an industry's federal tax burden refers to how the federal income tax affects its return on total investment through such critical elements as the definition of taxable income, adjustments to this income, tax rates, and adjustments to tax liability. Economists typically measure an industry's federal tax burden as its average effective tax rate, which is the ratio of its federal tax liability after all credits (except the foreign tax credit) to its pre-tax income, expressed as a percentage. This measure is not without shortcomings. A principal problem is that average effective rates do not fully capture the influence of tax provisions that accelerate the timing of deductions or delay the recognition of income.

A comparison of average effective federal tax rates for the drug industry and major U.S. industries indicates that the drug industry's federal tax burden was significantly less than the average burden for all industries from 1996 through 1998, but that in the next three years, it rose to the point that it was nearly identical to the average for all industries in 2000 and 2001. This upward shift was due mainly to a phase-out of the possessions tax credit that commenced in 1997 and is to come to fruition in 2005. Pharmaceutical firms have been major beneficiaries of this credit. As corporate income tax return data for years after 2001 become available, it would not be surprising if the pharmaceutical industry's tax burden were to remain near the average for all industries. Pharmaceutical firms also appear to benefit substantially (and perhaps more than many other firms) from two tax preferences whose combined influence is not fully reflected in average tax rates: (1) the deferral of federal income tax on the retained earnings of foreign subsidiaries of U.S.-based corporations, and (2) the expensing of R&D and advertising outlays.

Available evidence suggests that current federal tax law has little influence on the pharmaceutical industry's incentive to invest in R&D. This is because R&D investment in the industry is driven to a far greater extent by the competitive strategies of pharmaceutical firms. Nonetheless, a substantial increase in the industry's tax burden would be likely to affect the industry's ability to invest in innovation.

At least one bill that would alter the tax treatment of many pharmaceutical firms has been introduced in the 109th Congress. H.R. 575 would deny a tax deduction for any amount spent by a business taxpayer on direct-to-consumer advertising.

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At times, it seems as though the pharmaceutical industry thrives on controversy. On the one hand, firms that develop, produce, and sell brand-name or patented drugs have been lauded for their large and rising investments in the development of safer or more effective versions of existing medicines and new medicines that advance the treatment of a host of serious illnesses.[1] On the other hand, the same firms have been excoriated for pricing policies that result in U.S. customers paying considerably more for the same branded drugs than many customers in other developed countries in Europe and Asia, their efforts to thwart or delay competition from cheaper generic drugs, their relatively high rates of return on investment, and their substantial and rapidly rising outlays for advertising and product promotion.[2] Framing these sharply contrasting sentiments is a long-standing policy debate over how best to improve access to expensive but needed medicines among Americans of all ages without establishing costly new federal entitlement programs or undermining current financial incentives for pharmaceutical innovation. The number of new drugs entering the market year after year and their pricing have important effects on this access.

A key issue in this debate is the forces shaping the domestic climate for the discovery and commercial development of new medicines. One such force is federal policy. The federal government plays a varied and far-reaching role in pharmaceutical innovation. It is a role that encompasses a wide range of laws and programs, including direct federal funding of pharmaceutical research and development (R&D), federal regulation of the safety and efficacy of new medicines and the use and advertising of existing medicines, federal patent protection for prescription drugs, federal support of biomedical research and education in universities, federal financing of drug purchases through Medicaid and Medicare, and federal tax subsidies for R&D and employer-provided health insurance. Indeed, the influence of federal policy on new drug development is so profound that it is indeed difficult to imagine what the domestic climate for pharmaceutical innovation would be like in its absence.

This report examines a small slice of the federal policies influencing pharmaceutical innovation: the federal tax burden on the pharmaceutical industry. The federal tax code affects private investment in new drug discovery and development in a variety of ways, and these linkages form the core of the report. More specifically, it analyses the industry's federal tax burden from 1995 to 2001—the most recent year for which federal corporate tax return data are available—focusing on the provisions in the federal tax code that appear to generate significant tax benefits or penalties for pharmaceutical firms that invest heavily in R&D. The size of the industry's tax burden influences its capacity to invest in innovation. The report begins with an examination of the distinguishing traits of the pharmaceutical industry directly related to its tax treatment and concludes with a description of legislative proposals to modify some aspect of this treatment in the 109th Congress.

[1] In 2003, companies that were members of the Pharmaceutical Research and Manufacturers of America, the principal U.S. trade association for the pharmaceutical industry, spent an estimated $27.4 billion on domestic pharmaceutical research and development (R&D), up from $11.1 billion in 1994. During the same decade, the U.S. Food and Drug Administration (FDA) approved an average of 32 new medicines per year. (See Pharmaceutical Research and Manufacturers of America, *Pharmaceutical Industry Profile 2004* (Washington: 2004), pp. 11 and 39.)

[2] Between June 2000 and June 2004, the Consumer Price Index for all urban consumers (CPI-U) for prescription drugs rose 18.6%, compared to an increase of 10.0% for the CPI-U for all items. According to the most recent data for the Fortune 500 companies, the average ratio of after-tax income to revenues for the pharmaceutical industry in 2003 was 14.3%, compared to a median ratio for all Fortune 500 companies of 4.6%. Total promotional spending by the pharmaceutical industry rose from over $9 billion in 1996 to over $19 billion in 2001 (see the Henry J. Kaiser Family Foundation, *Prescription Drug Trends* (Washington: May 2003), available at http://www.kff.org.

Distinguishing Characteristics of the Pharmaceutical Industry Relevant to Its Federal Tax Burden

Most industries have distinctive traits, essential features born of the singular technologies around which they are built and their evolving requirements for competitive success and long-term growth. The pharmaceutical industry is one of these industries. In the minds of many, what distinguishes firms that develop, produce, promote, and sell patented or branded prescription drugs is their propensity to spend heavily on R&D and advertising, concentration on certain therapeutic categories to the exclusion of others, relatively high dependence on patents to generate sustained growth in profits and bolster competitiveness, and vast network of foreign operations. It turns out that most of these traits have important implications for the industry's federal tax burden.

Heavy Investment in R&D

The pharmaceutical industry is one of the most research-intensive of all U.S. industries. At the same time, it receives little in the way of direct R&D funding from federal government agencies. According to estimates made by the National Science Board, U.S. producers of drugs and medicines spent 9.8% of net sales on domestic R&D in 2000, compared to ratios of 3.4% for all industries and 3.3% for manufacturing.[3] In the same year, U.S. producers of drugs and medicines spent $12.8 billion of their own and other non-federal funds on domestic R&D. It is not known how much the federal government spent on pharmaceutical R&D in 2000, but the amount probably was tiny in comparison to industry spending; in 1997, for instance, federal spending for this purpose totaled a mere $3 million.[4] The principal trade association for the U.S. pharmaceutical industry, the Pharmaceutical Research and Manufacturers of America (or PhRMA), estimates that in 2003, domestic spending on pharmaceutical R&D by member firms totaled $27.4 billion, up from $10.5 billion in 1993.[5] However, the industry spent a smaller share of domestic sales revenue on R&D in 2003 (17.7%) than in 1993 (21.6%).

Most pharmaceutical firms invest heavily in R&D because they have no other choice if they want to survive and grow over time. Simply put, R&D is the primary engine of long-term growth in the industry. It is said that risk and reward go hand in hand in the realm of business investment, and this intimate connection is abundantly evident in pharmaceutical R&D. On the one hand, discovering and developing new breakthrough drugs is a time-consuming, risky, and costly process.[6] On the other hand, firms that develop new breakthrough drugs can reap huge profits

[3] National Science Foundation, Division of Science Resources Statistics, *Research and Development in Industry: 2000*, NSF 03-318 (Arlington, VA: 2003), table A-20, p. 74.

[4] National Science Board, *Science & Engineering Indicators—2000* (Arlington, VA: National Science Foundation, 2000), appendix tables 2-54 and 2-55, pp. A-97 and A-99.

[5] *Pharmaceutical Industry Profile 2004*, p. 39.

[6] According to research findings summarized by PhRMA, the average period from synthesis of a new compound to approval by the U.S. Food and Drug Administration (FDA) exceeded 14 years in the 1990s; only one out of every 5,000 compounds synthesized in a laboratory ends up gaining FDA approval; the cost of developing a new drug (including the cost of failures) rose from $54 million in 1976 to $802 million in 2000; and as few as three out of 10 newly approved drugs earn enough revenues to cover their R&D cost. See Pharmaceutical Research and Manufacturers (continued...)

from their sale until the firms' patents expire or competing patented drugs enter the market.[7] Advances in the technology for new drug development over the past 25 years have greatly increased the number of drug compounds with significant therapeutic potential being discovered. Nonetheless, there is some concern that the flow of new breakthrough drugs through the R&D pipeline is slowing to the point where some major multinational firms might be forced to merge. A recent study by the National Institute for Health Care Management Foundation found that only 15% of the 1,035 new drug applications approved by the FDA from 1989 to 2000 contained new chemical ingredients offering significant therapeutic advantages over existing drugs.[8] In addition, in 2002, the FDA approved 17 new drugs for sale in the United States, the lowest total since 1983 and far below the all-time high of 56 new drugs approved in 1996.[9] A new wave of mergers could affect future trends in pharmaceutical R&D investment by lessening competition in key segments of the domestic market for prescription drugs.[10]

Heavy Investment in Advertising and Product Promotion

Given that the pharmaceutical industry invests heavily in R&D but the prospects of delivering highly profitable drugs to the marketplace have remained stubbornly slight, it may come as no surprise that most pharmaceutical firms also spend large sums on promoting their branded products directly to physicians and consumers. Firms that develop new drugs offering significant therapeutic advantages over existing drugs seem especially inclined to spend heavily on advertising and promotion. Early in a new drug's life cycle, the advertising and promotion often are aimed at capturing a major share of the market as quickly as possible; but later in the drug's life cycle, their main intent can shift to fending off or thwarting budding competition from generic versions or patented substitutes known as "me-too drugs."

Available industry data suggest that many pharmaceutical firms regard advertising and promotion as an indispensable weapon in their quest for long-term growth. According to one reliable source, domestic promotional spending by pharmaceutical firms totaled over $23 billion in 2003, up from about $9 billion in 1996. More than $13 billion of the 2003 expenditures went to the distribution of free drug samples (valued at retail cost) to physicians; another $7 billion covered the cost of making direct sales pitches to physicians; and $3.4 billion were channeled into direct advertising to consumers.[11]

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of America, *2002 Industry Profile* (Washington: 2002), pp. 18-22.

[7] For example, U.S. retail sales of Lipitor, a patented cholesterol-lowering drug sold by Pfizer, totaled $4.5 billion in 2001, up from $3.7 billion in 2000. See National Institute for Health Care Management Foundation, *Prescription Drug Expenditures in 2001: Another Year of Escalating Costs* (Washington: April 2002), Table 3, p. 13.

[8] National Institute for Health Care Management Foundation, *Changing Patterns of Pharmaceutical Innovation* (Washington: May 2002), p. 3.

[9] Iain Cockburn, "The Changing Structure of the Pharmaceutical Industry," *Health Affairs*, vol. 23, no. 1 (Jan./Feb. 2004), p. 10.

[10] Andrew Pollack, "Despite Billions for Discoveries, Pipeline of Drugs is Far from Full," *New York Times*, April 19, 2002, pp. C1 and C7.

[11] Standard & Poor's, *Industry Surveys, Healthcare: Pharmaceuticals* (New York: June 24, 2004), pp. 10-11. The estimate for spending on promotion and advertising in 2003 does not include expenditures by pharmaceutical firms for professional meetings and events attended by physicians.

The high priority given to informing and encouraging brand loyalty among physicians reflects a fundamental feature of the market for prescription drugs, one that is largely absent from the markets for most goods and services: consumers rely heavily on the judgment and consent of third parties—in this case doctors—in deciding which prescription drugs to use when stricken with illness or injury.

Competitive Structure

Another notable distinguishing feature of the pharmaceutical industry is its fragmented competitive structure. No single firm or small cluster of firms dominates the U.S. market for branded prescription drugs. The U.S. Census Bureau has reported that in 1997, the four largest producers accounted for 32% of the value of domestic shipments of medicines, the eight largest for 48%, and the 20 largest for 67%.[12] Ten years earlier, the share of the four largest was 22%, and that of the 20 largest 65%.

Nonetheless, some firms are able to gain supremacy in certain key segments of the market. Such dominance is most likely to arise when a firm is the first to bring a new breakthrough drug to the marketplace. For example, in April 2004, 75% of U.S. prescriptions for anti-psychotic drugs were filled by drugs made by three companies; three companies accounted for 60% of U.S. prescriptions for treating migraine headaches; and 78% of U.S. prescriptions for cholesterol-lowering drugs were filled by drugs made by three companies.[13] But this dominance can turn out to be ephemeral as it rests partly on the patent protection granted to the medicines sold by these companies and partly on the absence of competition from newer, more effective or safer medicines.

Dependence on Patent Protection

The central role played by technological innovation in the growth and transformation of the pharmaceutical industry over time highlights another distinguishing trait of the industry: the heavy reliance of major pharmaceutical firms on patents to generate large revenue streams and profits and to bolster their competitiveness. Patents give their owners a temporary legal monopoly over commercial uses of an invention. In the United States and most other advanced industrialized nations, the life of a patent is 20 years from the date of application. A patent holder may license other firms to exploit the invention, but it would typically do so in exchange for royalties, which can be thought of as compensation for relinquishing exclusive control. Pharmaceutical firms may claim patents for the design of drug compounds, their formulation as drug therapies, their uses in treating illnesses, and their methods of manufacture.[14] Industry executives regard patents as one of the most effective means of safeguarding the competitive advantages arising from investing in innovation.[15]

[12] U.S. Census Bureau, *1997 Economic Census: Concentration Ratios in Manufacturing* (Washington: June 2001), Table 2, p. 11.

[13] Standard & Poor's, *Industry Surveys, Healthcare: Pharmaceuticals*, pp. 12-13.

[14] U.S. Congress, Office of Technology Assessment, *Pharmaceutical R&D: Costs, Risks, and Rewards* (Washington: GPO, Feb. 1993), pp. 290-293.

[15] F. M. Scherer, *Industry Structure, Strategy, and Public Policy* (New York: Harper-Collins, 1996), pp. 360-362.

The industry's strong dependence on patents to secure the returns on R&D investment partly explains why drug firms have long been among the most profitable of all firms. From 1960 to 1991, the reported rate of return on stockholders' equity for the pharmaceutical firms included in the annual ranking of the top 500 industrial corporations by *Fortune* magazine averaged 18.4%, compared to 11.9% for all 500 firms.[16] And as recently as 2001, pharmaceuticals ranked first in return on shareholders' equity (33.2%) among the 48 industries represented in the *Fortune* 500.[17] Perhaps the most persuasive evidence that patents are critical to the profitability of pharmaceutical firms can be found in the differences in selling prices between branded drugs and their generic counterparts. Medicines protected by patents typically command far higher prices than the generic versions which enter the market after the patents expire.[18]

Extensive Foreign Operations

No account of the distinctive traits of the U.S. pharmaceutical industry having a bearing on its federal tax treatment would be complete if it were to disregard the industry's extensive foreign operations, including Puerto Rico. For many U.S.-based pharmaceutical firms, these operations have a significant impact upon their financial health, competitive posture, and federal tax burden. Most major U.S. pharmaceutical firms own foreign subsidiaries that manufacture and sell drugs and conduct R&D; many of these subsidiaries are located in Europe and Japan, the two largest regional markets (measured in U.S. dollars) for patented medicines after North America.[19] Like U.S. automobile producers, major pharmaceutical firms appear to have recognized three or four decades ago that if they were to become serious long-term players in key foreign markets, they needed to establish a manufacturing and research presence in each market.[20]

The following figures illuminate the extent to which the industry has built such a presence in important foreign markets. Perhaps the most comprehensive source of data on foreign direct investment abroad by U.S. firms is the U.S. Department of Commerce. According to Commerce Department data, by 2001, a total of 35 U.S.-based pharmaceutical firms with domestic assets valued at $284.1 billion had established a total of 1,098 majority-owned foreign affiliates with assets valued at $355.9 billion.[21] Sales of the foreign affiliates in that year amounted to $77.6 billion, or 45% of total sales reported by their U.S. parent firms; and total employment by the affiliates came to 211,600 workers, or 54% of total employment reported by their U.S. parent firms. A second but more limited source of information on the foreign operations of U.S. pharmaceutical firms is PhRMA. In 2003, domestic sales by PhRMA member companies amounted to an estimated $154.6 billion, while foreign sales by U.S.-based PhRMA member companies and the U.S. affiliates of foreign-based PhRMA member companies totaled an estimated $58.1 billion, or 37% of domestic sales.[22] In the same year, PhRMA member companies

[16] Ibid., p. 342.

[17] 2002 Fortune 500, "Top Performing Companies and Industries," http://www.fortune.com/fortune/fortune500, visited April 23, 2002. In 2003, the industry's return on shareholder equity was 22.1%, placing it fourth among the 47 industries represented in the Fortune 500.

[18] Once a prescription drug's patent expires, generic drugs, which are chemical equivalents of branded drugs, usually appear immediately, and prices begin to fall. The price of a new generic drug is typically 25% to 50% lower than that of the branded version. See Standard & Poor's, *Healthcare: Pharmaceuticals*, p. 17.

[19] Ibid., p. 6.

[20] Scherer, *Industry Structure, Strategy, and Public Policy*, p. 342.

[21] The data can be accessed at http://www.bea.gov/bea/di/home/directinv.htm.

[22] Pharmaceutical Research and Manufacturers of America, *Pharmaceutical Industry Profile 2004* (Washington: (continued...)

spent an estimated $27.4 billion on R&D conducted in the United States, while foreign R&D spending by U.S.-based PhRMA member companies and the U.S. affiliates of foreign-based PhRMA member companies was an estimated $5.8 billion, or 21% of domestic R&D spending.[23]

Although the importance of foreign markets varies from company to company, some analysts estimate that the U.S. pharmaceutical industry derives about 40% of it revenue from foreign sales.[24] Because many countries outside the United States impose strict controls on prescription drug prices, foreign markets tend to account for a smaller portion of overall profits than sales. But there are notable exceptions. In 2003, for example, six of the largest U.S.-based pharmaceutical firms received over 65% of their combined profits from foreign operations, up from about 38% in 1994.[25]

Federal Income Taxes Paid by the Pharmaceutical Industry Between 1990 and 2001

Federal income taxes paid by the pharmaceutical industry from 1990 to 2001—the most recent year for which corporate tax return data are available—are shown in **Table 1**. The figures on tax liability include any alternative minimum taxes owed by drug firms.

The industry's taxable income as shown in **Table 1** represents a blend of domestic income earned by U.S.-based corporations and U.S. affiliates of foreign-based firms and income earned abroad by foreign branches and subsidiaries of U.S.-based corporations. Such a blend is appropriate because the United States taxes business income on the basis of residence and not territorial source. Consequently, corporations chartered in the United States owe taxes to the federal government on their worldwide income, whether it is earned inside or outside the country. U.S.-based firms also pay income taxes to foreign governments on much of the income earned by their foreign affiliates. To avoid double taxation of this income, U.S. tax law allows U.S.-based multinational firms to claim a credit for foreign income tax payments up to their U.S. tax liability on the income. In addition, U.S. affiliates of corporations chartered in other countries are required to pay federal income taxes on income they earn in the United States.

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PhRMA, 2004), p. 44.

[23] Ibid., p. 39.

[24] Standard & Poor's, *Healthcare: Pharmaceuticals*, p. 25.

[25] The firms were Pfizer, Johnson & Johnson, Merck, Bristol-Myers Squibb, Abbott Laboratories, and Schering Plough. See John A Almond and Martin A. Sullivan, "Drug Firms Park Increasing Share of Profits in Low-Tax Countries," *Tax Notes*, Sept. 20, 2004, p. 1,336.

Table 1. Federal Income Tax Liability for the Pharmaceutical Industry, 1990 to 2001

(millions of dollars)

Year	Taxable Income	Federal Income Tax Before Credits	Tax Credits Claimed (Except the Foreign Tax Credit)	Income Tax After Credits (Except the Foreign Tax Credit)	Average Effective Tax Rate (%)[a]
1990	15,934	5,482	1,825	3,657	22.9
1991	17,452	6,026	2,070	3,956	22.7
1992	19,920	6,920	2,238	4,682	23.5
1993	19,997	7,092	2,441	4,651	23.2
1994	24,837	8,752	2,479	6,273	25.2
1995	23,963	8,502	1,880	6,622	27.6
1996	24,810	8,816	1,948	6,868	27.7
1997	27,627	9,729	1,983	7,746	28.0
1998	29,218	10,240	2,204	8,216	28.1
1999	30,912	10,851	1,138	9,713	31.4
2000	31,102	10,918	1,027	9,890	31.8
2001	32,958	11,435	1,060	10,375	31.5

Source: Internal Revenue Service, Statistics of Income Division, *Corporation Source Book* (Washington: GPO, 1990 to 2000).

a. Income tax after credits (except the foreign tax credit) divided by taxable income and multiplied by 100.

Several noteworthy trends can be discerned in the figures in the table. They make clear that the 1990s was a period of robust growth for the pharmaceutical industry: its taxable income more than doubled between 1990 and 2001. It is also clear from the table that the industry benefitted from available tax credits (excluding the foreign tax credit): from 1990 to 2001, its average tax liability after credits was 79% of its average tax liability before credits. (The reason for excluding the foreign tax credit from these calculations is explained below.) At the same time, the value of these credits trended downward after peaking in 1994, reaching a low of $1.027 billion in 2000. The primary force behind this decline was a phase-out of the possessions tax credit that began in the late 1997 and is supposed to continue through 2005. As a result, the difference between tax liability before credits and tax liability after credits narrowed considerably from 1990 to 2000, before increasing somewhat in 2001.

The main tax credits claimed by the drug industry are shown in **Table 2**. Their impact on the industry's federal tax burden is discussed in the following sections.

Foreign Tax Credit

Unlike the other tax credits included in the table, the foreign tax credit technically does not confer a tax benefit on pharmaceutical firms. Section 901 of the Internal Revenue Code (IRC) holds that a corporation chartered in the United States and paying income and related taxes to foreign governments may claim a limited tax credit for those tax payments. This statutory provision is intended to avoid the double taxation of income earned by foreign branches or subsidiaries of U.S.-based corporations and repatriated to their U.S. parents. As a result, the foreign tax credit should be added to a firm's tax liability in measuring its tax burden. The credit is limited to the

tentative federal income tax owed on foreign-source income and may not offset any federal tax owed on domestic-source income. In addition, the U.S. Treasury does not refund foreign income taxes paid in excess of the tentative federal tax. Any such excess may be carried back up to two years or carried forward up to five years, subject to the same limitations.

Possessions and Puerto Rican Economic Activity Tax Credit

The pharmaceutical industry has been a major beneficiary of what was known until 1996 as the possessions tax credit under IRC section 936 and now is called the Puerto Rican Economic Activity Credit (PREAC) under IRC section 30A. In 2001, the industry was able to reduce its federal income tax liability by more than 5% by claiming the credit, and it accounted for 49% of the total value of claims for the credit by all industries. Corporations chartered in the United States may be able to exclude from federal income tax as much as 40% of their income from business operations they own in Puerto Rico, the U.S. Virgin Islands, and other U.S. territorial possessions. In order to take advantage of this exclusion, a firm must derive 80% of its gross income from business operations in one or more of these possessions and 75% of its overall gross income from the active conduct of a business.

The PREAC is equal to a firm's tax liability on possession-source income, subject to one of two alternative caps enacted in 1993. Under one cap—known as the "economic-activity limitation"—the credit is restricted to specified wage and depreciation costs; under the second cap—known as the "percentage limitation"—the credit is limited to 40% of the unlimited credit a firm could claim under rules in effect before 1993. As a result of the Small Business Job Protection Act of 1996, the credit is scheduled to phase out at the end of 2005 for firms claiming it in 1996 and was repealed immediately for all other firms.[26] In addition, the Act contains different phase-out rules for firms subject to the percentage limitation and for those subject to the economic-activity limitation.

Table 2. Main Federal Tax Credits Claimed by the Drug Industry from 1990 to 2001

(millions of dollars, unless otherwise noted)

Year	Foreign Tax Credit	Possessions Tax Credit	General Business Tax Credit[a]		
			Orphan Drug Tax Credit	Research Tax Credit	Total
1990	1205	1666	15	NA	142
1991	1367	1883	18	235	150
1992	1613	2033	17	264	180
1993	1886	2150	19	306	208
1994	1960	2116	19	307	271
1995	2633	1611	0[b]	164	214
1996	2628	1651	24	252	219
1997	2204	1591	52	552	329

[26] For further details on the design of the credit and congressional proposals to extend it, see CRS Report RS20695, *The Puerto Rican Economic Activity Tax Credit: Current Proposals and Scheduled Phaseout*, by David L. Brumbaugh.

Year	Foreign Tax Credit	Possessions Tax Credit	General Business Tax Credit[a]		
			Orphan Drug Tax Credit	Research Tax Credit	Total
1998	2677	1459	50	630	514
1999	2938	866	66	714	222
2000	2414	689	79	802	312
2001	2280	621	70	806	416

Source: Internal Revenue Service, Statistics of Income Division (SOI), *Corporation Source Book* (Washington, 1990 to 2000), and unpublished data obtained via e-mail from Marty Shiley of the Corporate Returns Analysis Section of the SOI.

a. Under IRC section 38, the general business credit is a limited, non-refundable credit against income tax that is claimed after all other non-refundable credits, except for the credit for the alternative minimum tax. The general business credit is the sum of the rehabilitation credit, the energy credit, the reforestation credit, the work opportunity credit, the welfare-to-work credit, the alcohol fuels credit, the research credit, the low-income housing credit, the enhanced oil recovery credit, the disabled access credit, the renewable resources electricity production credit, the empowerment zone employment credit, the Indian employment credit, the employer Social Security credit, the orphan drug credit, the new markets credit, small employer pension plan start-up costs credit, and the employer-provided child care credit.

There is a limit on the general business credit that a corporate taxpayer may claim in a given tax year: it may not exceed its tax liability less the greater of (a) the tentative alternative minimum tax or (b) 25% of regular tax liability above $25,000. If the general business credit claimed in the current year exceeds this limitation, the excess or unused credit may be carried back one year or forward 20 years. With the exception of 1995, the combined value of the orphan drug tax credit and research tax credit claimed by the pharmaceutical industry exceeded the total general business credit it was permitted to claim by substantial margins. The reason lies in this limitation.

b. The orphan drug tax credit was suspended from January 1, 1995 to June 30, 1996. Under the Small Business Job Protection Act of 1996 (P.L. 104-188), the credit was reinstated from July 1, 1996 to May 31, 1997 and made part of the general business credit. The credit has yet to be reinstated retroactively for the period from January 1, 1995 to June 30, 1996.

There is evidence that the pharmaceutical industry responded to the credit by establishing a substantial manufacturing base in Puerto Rico. According to a 1992 report by the General Accounting Office, a total of 26 pharmaceutical firms had manufacturing operations there in 1990. They realized an estimated tax savings of $10.1 billion from these operations, which produced 17 of the 21 most commonly prescribed drugs in the United States at the time.[27]

General Business Credit

The general business credit is composed of 18 separate and distinct tax credits. Nonetheless, the vast share of the pharmaceutical industry's allowable claims for the credit since 1990 appear to center around a single credit: that for increasing research expenditures under IRC section 41. As the data in **Table 2** show, from 1991 to 2000, the amount of the research tax credit claimed by the industry exceeded its allowable general business tax credit in every year except 1995. During the period from 1995 to 2000, the cumulative value of claims for the research credit by the industry exceeded the cumulative value of its allowable general business credit by $1.3 billion. Under the rules of the general business credit, any unused credits may be carried back one year or forward

[27] U.S. General Accounting Office, *Pharmaceutical Industry: Tax Benefits of Operating in Puerto Rico*, GAO report GGD-92-72BR (Washington: May 1992), pp. 4-7.

for up to 20 years. So some pharmaceutical firms may have large reserves of unused research tax credits to draw upon to reduce their regular federal tax liabilities in coming years.

Research Tax Credit

The regular research tax credit is equal to 20% of a firm's qualified spending on research conducted in the United States and its territorial possessions above a base amount.[28] It is due to expire at the end of 2005. In order to minimize the likelihood of rewarding firms for undertaking R&D they would have done in any event, the credit's rate structure is incremental instead of flat. The main direct effect of the credit is to lower the after-tax cost of qualified research. Various rules governing the use of the credit make its marginal effective rate much lower than its statutory rate for many firms. Firms have the option of claiming an alternative incremental research credit with a maximum statutory rate far below the statutory rate of the regular credit. Moreover, they may also claim a tax credit equal to 20% of payments for contract basic research to certain organizations (mainly universities) above a base amount, in addition to either the regular or alternative credits. The following expenses are eligible for the regular, alternative, and basic research credits: wages and salaries of researchers, supplies and materials used in qualified research, leased computer time for qualified research, and either 65% or 75% of payments for contract research.

The pharmaceutical industry is a leading beneficiary of the research credit among R&D-performing industries: in 2000, drug industry claims for the credit totaled nearly $802 million, or 11% of the total value of claims for the credit. But it would be erroneous to infer from these figures that the credit gives major pharmaceutical firms a potent incentive to raise their R&D spending from one year to the next. The reason is that the industry seems to derive little benefit from the credit relative to its huge outlays for R&D. There is plenty of evidence to substantiate this notion. For example, total claims for the credit by the pharmaceutical industry were equal to 3% of total domestic R&D spending by PhRMA member companies from 1995 to 2000. Moreover, relatively few pharmaceutical firms claim the research tax credit in a given tax year: in 1997, about one in every five federal corporate income tax returns filed by pharmaceutical firms included a claim for the research tax credit. Additionally, even the largest U.S. pharmaceutical firms cannot count on claiming the credit despite spending hundreds of millions of dollars or more on R&D. In a 2001 report, CRS estimated that under current tax law, the U.S.-based pharmaceutical company Merck was unable to claim the regular research tax credit in 1998 despite spending $1.8 billion on R&D, or $137 million more than in 1997.[29] The rules governing the use of the credit explain much of its limited usefulness to the pharmaceutical industry.

Orphan Drug Credit

Only one of the credits shown in **Table 2** can be rightly said to be targeted at the main products of the pharmaceutical industry, and that credit is the orphan drug tax credit. Not surprisingly, the industry is its main beneficiary.[30] Under IRC section 45C, a firm may claim a tax credit equal to

[28] For more details on the design of the credit and initiatives in the 108th Congress to modify it, see CRS Report RL31181, *Research and Experimentation Tax Credit: Current Status and Selected Issues for Congress*, by Gary Guenther.

[29] CRS Report RL30479, *The Research and Experimentation Tax Credit: Current Law and Selected Policy Issues for the 106th Congress*, by Gary Guenther, pp. 38-39.

[30] In 2000, firms classified in the drug industry accounted for 70% of the total value of claims for the credit.

half the cost of human clinical trials for drugs intended to treat rare diseases. Such a credit has the potential to stimulate significant increases in investment in the development of drugs to treat such diseases because human clinical trials, which are conducted in three phases, are the most time-consuming and costly step in the new drug development process.[31] A rare disease or condition is defined as one likely to affect fewer than 200,000 individuals residing in the United States, or one likely to affect more than 200,000 such individuals but for which there is no realistic prospect of recovering R&D costs from U.S. sales alone. The credit applies to the cost of supplies and the wages and salaries of researchers used in clinical trials for orphan drugs only; the cost of any structures and equipment used in the trials cannot be added to the base for the credit. It is permanent and a component of the general business credit and thus subject to its limitations.

Since the orphan drug credit was enacted in 1983 as part of a package of measures aimed at stimulating increased investment in the development of new drugs to treat rare diseases and conditions, over 225 such drugs have gained regulatory approval in the United States. Ironically, some of them went on to become major sources of revenue for their producers, including Glaxo Wellcome's anti-AIDS drug Retrovir AZT, Amgen's anti-anemia drug Epogen, and Genentech's human growth hormone Protropin.[32]

Federal Tax Burden on the Drug Industry and Major U.S. Industries from 1996 to 2001

Generally, the federal tax burden on an industry refers to how the tax code affects an industry's return on investment through the definition of taxable income, adjustments to taxable income (e.g., deductions and exemptions), tax rates, and adjustments to tax liability (e.g., tax credits and minimum tax payments). In essence, these provisions serve two purposes: (1) raising revenue to fund government operations and programs and (2) giving firms incentives to engage in activities favored by policymakers. The tax credit for increasing research expenditures exemplifies the second purpose. Reduced to its simplest terms, an industry's federal tax burden denotes how much of its profits are sacrificed in order to comply with current tax law. As this burden rises, firms have fewer funds to invest as they please.

Economists define a firm's tax burden as its share of real pre-tax economic income paid in taxes. But it is difficult to determine a firm's economic income from business tax return data because of provisions in the tax code that drive a wedge between economic income and taxable income. So alternative approaches must be used to measure business tax burdens, such as substituting taxable income as determined under current federal tax law for pre-tax economic income. Such an approach is taken here.

A common measure of an industry's federal tax burden is its average effective tax rate, which is the ratio of its federal income tax liability after credits to its income subject to tax, expressed as a percentage. As such, the ratio expresses the net effect of the federal tax code on the industry's pre-tax returns on past investments. This effect summarizes the ways in which the tax code both penalizes and rewards the economic activities of the firms making up the industry.

[31] Pharmaceutical Research and Manufacturers of America, *2002 Industry Profile*, pp. 19-22.

[32] Standard & Poor's, *Healthcare: Pharmaceuticals*, p. 21.

There are some drawbacks to using average effective tax rates to measure an industry's federal tax burden. One problem is that the rates reflect the impact of the tax code on the returns to an industry's previous investments and thus may overstate or understate the federal tax burden on current or possible future investments. Furthermore, average effective tax rates cannot accurately measure the federal tax burden for an industry because they fail to capture the influence of provisions in the tax code that accelerate the timing of tax deductions or delay the recognition of income for tax purposes. A better measure might be the marginal effective tax rate for an industry, which would capture the net effect of such provisions on the pre-tax returns on new investment by an industry.[33] Unfortunately, it is impossible to compute such a rate for most industries because the value of some important tax benefits (e.g., expensing of R&D costs) cannot be calculated using available corporate financial or tax return data, and not all firms in an industry invest in the same mix of assets to the same extent. Nonetheless, if average effective tax rates are applied consistently across industries and time, they can indicate whether or not their federal tax burdens differ and to what extent.

Table 3 shows the average effective federal tax rates for the drug industry and major U.S. industries from 1995 to 2001. The rates compare the industries' federal income tax liability after all credits (except the foreign tax credit) with their worldwide taxable income (as reported on their federal income tax returns). As such, they address neither the domestic tax burden on domestic income nor the worldwide tax burden on worldwide income for the industries. Instead, the rates represent something of a hybrid of the two measures, showing the federal tax burden on domestic income plus foreign income that has been recognized for federal tax purposes. As noted earlier, the foreign tax credit should be excluded from an industry's net tax liability because its purpose is to avoid the double taxation of foreign-source income. Including it would understate the federal tax burden on the industries.

It is clear from the table that the federal tax burden of the pharmaceutical industry gradually increased from 1996 to 2001, bringing it into line with the average tax burden for all industries. This trend may come as a surprise to those who believe that the industry has long been taxed relatively lightly. The principal force behind the industry's rising tax burden was the phase-out of the possessions tax credit that commenced in 1997. As was noted earlier, pharmaceutical firms have been among the largest beneficiaries of the credit. One way to illustrate this point is to compute the industry's tax burden in the absence of the credit. If the credit had been unavailable in 1998 and 1999, the pharmaceutical industry's average effective tax rate would have been almost identical to that of all industries: 33.6% compared to 33.5%.

[33] The marginal effective tax rate on business income is the expected pre-tax rate of return minus the expected after-tax rate of return on a new investment, divided by the pre-tax rate of return. It typically accounts for the statutory tax rate, accelerated depreciation allowances, and economic rates of depreciation adjusted for inflation. Nonetheless, the rate can be adjusted to reflect the influence of other detailed provisions of the tax code. In essence, the rate summarizes the tax incentives to invest in a particular asset or set of assets. As such, it may bear little relation to an industry's average effective tax rate, which measures the actual tax paid in a given year as a share of actual capital income in that year earned from all past investment. For more information on the computation and uses of the marginal effective tax rate, see Don Fullerton, "Marginal Effective Tax Rate," in *The Encyclopedia of Taxation and Tax Policy*, Joseph J. Cordes, Robert D. Ebel, and Jane G. Gravelle, eds. (Washington: Urban Institute Press, 1999), pp. 231-233.

Table 3. Average Effective Tax Rates for the Drug Industry and Major U.S. Industries from 1996 to 2001 (%)

Industry	1996	1997	1998	1999	2000	2001	Average Rates for 1996 to 2001
All Industries	33	33	33	33	33	33	33
Agriculture, Forestry & Fishing	28	26	28	28	28	28	28
Mining	33	34	33	35	31	33	33
Construction	30	30	30	30	31	31	30
Manufacturing	33	33	33	33	33	32	33
Drugs	**28**	**28**	**28**	**31**	**32**	**32**	**30**
Transportation, Warehousing & Public Utilities	33	32	32	33	32	32	32
Wholesale & Retail Trade	33	33	33	33	33	33	33
Finance, Insurance & Real Estate	34	34	34	34	34	34	34
Information and Services	32	28	33	33	34	32	32

Source: Calculated by CRS from figures taken from Internal Revenue Service, Statistics of Income Division, *Corporation Source Book* (Washington: GPO, 1996 to 2001).

Note: As calculated here, the average effective tax rate for an industry is the ratio of its federal income tax liability after all credits **except the foreign tax credit** to its worldwide taxable income, expressed as a percentage.

If marginal effective federal tax rates could be computed for typical investments by the industries shown in **Table 3**, it is likely that the drug industry would still have the lowest rate. The reason lies in certain tax preferences that tend to benefit pharmaceutical firms disproportionately but are not fully reflected in average effective tax rates. These preferences involve both deferral of federal income taxes and accelerated depreciation. Three tax preferences in particular may yield significant tax savings for U.S.-based pharmaceutical firms and thus deserve further exploration: (1) the deferral of federal income taxes on net income retained by foreign subsidiaries of U.S.-based corporations; (2) the expensing (or immediate deduction) of most R&D costs; and (3) the expensing of advertising and promotional costs.

Deferral of Federal Income Taxes on Foreign-Source Income

As was noted earlier, the federal government taxes corporations based or chartered in the United States on their worldwide income and grants them tax credits for any foreign income tax payments they make on foreign-source income up to their federal tax liability on that income. But not all foreign income is treated equally for U.S. tax purposes. Profits earned by foreign branches of U.S.-based corporations are taxed at the appropriate federal rates in the year when it is earned, regardless of whether the profits are repatriated. In contrast, profits earned by foreign corporate subsidiaries of these corporations is subject to U.S. taxation only when they are repatriated to the parent firms as dividends, royalty payments, or other income. The subsidiaries' profits may be taxed by the host countries, but any profits they retain are exempt from federal income taxation until the profits are repatriated. Such an exemption represents a deferral of U.S. income tax liability.

Deferral of this sort can generate significant tax benefits, particularly in cases where firms locate subsidiaries in countries with lower tax rates than the United States. The reason lies in the time value of money: a dollar received today is worth more than the same dollar received in the future. Therefore, the longer a taxpayer can defer a tax payment, the less it is worth in current dollars.[34] As a result, U.S.-based firms owning subsidiaries in countries with lower tax rates than the United States can reduce their real tax burden by having the subsidiaries retain their earnings indefinitely. The tax benefits arising from the opportunity to defer federal taxes on foreign-source income give U.S.-based firms a robust incentive to invest in countries with lower income tax rates than the United States.[35]

There is reason to believe that U.S.-based pharmaceutical firms reap significant tax benefits from this opportunity. According to a recent report in *Tax Notes*, the effective foreign income tax rate on the foreign profits of six major U.S. pharmaceutical firms was 17.6% in 2003; the maximum U.S. corporate tax rate in the same year was 35%.[36] The same report found that at the end of 2003, the nine largest U.S. pharmaceutical firms reported a cumulative total of $102 billion in unrepatriated foreign profits.[37] Another report in *Tax Notes* pointed out that six pharmaceutical firms were among the top 20 U.S.-based multinational firms out of a total of 67 ranked according to accumulated undistributed or unrepatriated foreign earnings included in their 2003 10-K reports filed with the Securities and Exchange Commission.[38] What is more, the controlled foreign corporate subsidiaries (CFCs) of U.S.-based pharmaceutical firms appear to exhibit a relatively strong propensity to retain earnings.[39] At the end of 1996, for instance, these subsidiaries reported having retained earnings equal in value to 40.3% of their assets; by contrast, the same ratio for controlled foreign subsidiaries in all industries was 11.4%.[40]

[34] To some analysts, the deferral of tax payments is analogous to receiving an interest-free loan from the federal government. For more details on the benefits of tax deferral, see Emil M. Sunley, "Deferral of Tax,"in *The Encyclopedia of Taxation and Tax Policy*, Joseph J. Cordes, Robert D. Ebel, and Jane G. Gravelle, eds. (Washington: Urban Institute Press, 1999), pp. 70-73.

[35] U.S. Congress, Senate Committee on the Budget, *Tax Expenditures: A Compendium of Background Material on Individual Provisions*, committee print, 106th Cong., 2d sess. (Washington: GPO, Dec. 2000), p. 32.

[36] The six firms are Pfizer, Johnson & Johnson, Merck, Bristol-Myers Squibb, Abbott Laboratories, and Schering Plough. See John A. Almond and Martin A. Sullivan, "Drug Firms Park Increasing Share of Profits in Low-Tax Countries," *Tax Notes*, Sept. 20, 2004, p. 1,337.

[37] Ibid., p. 1,338.

[38] The analysis focused on the top 100 of the Fortune 500 in 2003. Of these companies, 67 reported unrepatriated foreign profits of $352.5 billion in 2003. Six of the top 20 companies were pharmaceutical firms: Pfizer, Merck, Bristol-Myers Squibb, Schering-Plough, Eli Lilly, and Wyeth. They reported a total of $95.6 billion in accumulated unrepatriated foreign profits in 2003, or 27% of the total for the entire sample of 67 companies. See John A. Almond and Martin A. Sullivan, "While Congress Dawdles, Trapped Foreign Profits Surge," *Tax Notes*, June 28, 2004, pp. 1587-1592.

[39] Direct foreign investment by U.S. corporations may take different forms, including establishing foreign branches, partnerships with foreign-based firms, and separate corporations. For U.S. tax purposes, a foreign corporation is considered a controlled foreign corporation (or CFC) when U.S. shareholders own more than 50% of its outstanding voting stock or more than 50% of the value of all its outstanding stock on any day during the foreign corporation's tax year.

[40] The calculations are based on data received via e-mail from John Miller of the Statistics of Income Division of IRS on May 15, 2002.

Temporary Dividends Received Deduction Under IRC Section 965

Given that the pharmaceutical industry is a major beneficiary of the ability of U.S.-based multinational firms to defer federal taxes on the profits earned by their foreign corporate subsidiaries, it should come as no surprise that the industry might also benefit more than many other industries from a provision in the American Jobs Creation Act of 2004 (AJCA, P.L. 108-357) allowing a temporary tax reduction for the repatriation of those profits.

Under IRC section 965, which was added by AJCA, U.S. corporations may claim a deduction equal to 85% of cash dividends in excess of a base-period-amount they receive from their CFCs and invest in the United States under an eligible plan approved by a top corporate officer and the board of directors. For corporations subject to a marginal tax rate of 35%, the deduction lowers the rate on any dividends received to 5.25%: 0.35 x 0.15. Corporations may claim the deduction once, and they may do so either in their last tax year before October 22, 2004 (the date of enactment for the AJCA) or their first tax year during the 12 months starting on October 22, 2004. The base-period amount for a corporation is the average amount of cash dividends it received from CFCs in three of the five most recent tax years ending on or before June 30, 2003; the years with the lowest and highest repatriation amounts are disregarded. There is a limitation on the amount of cash dividends that may be deducted: it is the greater of $500 million; or the amount shown on a firm's financial statements as earnings permanently reinvested outside the United States; or in the case of firms whose financial statements do not specify an amount of earnings permanently reinvested outside the United States but do report a tax liability for those earnings, the amount of that liability divided by the maximum corporate tax rate of 35%.

In recent months, four of the six largest U.S. pharmaceutical firms have announced plans to repatriate $56 billion in foreign profits to take advantage of the temporary deduction on dividends received. One analyst expects that pharmaceutical firms will account for about half of all the profits repatriated by publicly held companies.[41]

Expensing of R&D Spending

Pharmaceutical firms also appear to derive significant benefits from the tax treatment of research expenditures under IRC section 174. The provision permits business taxpayers to deduct qualified R&D expenses in the year when they are incurred. Such treatment is known as expensing. To be eligible for expensing, R&D expenditures must meet the following criteria: they must relate to a firm's trade or business; they cannot be considered capital costs; and they must be directed at "activities intended to discover information that would eliminate uncertainty concerning the development or improvement of a product."[42] In practice, only the wages and salaries of research personnel and cost of supplies and materials used in qualified research and related overhead costs may be expensed. By contrast, the cost of structures and equipment used in this research must be recovered over 15 years and three years, respectively, using allowable depreciation methods.

For most firms, spending on R&D creates intangible assets (such as patents) that can generate a substantial flow of revenues over a number of years. More often than not, the economic life of these assets exceeds one year. In theory, a firm's spending on R&D represents a cost that should

[41] Alex Berenson, "Drug Makers Reap Benefits of Tax Break," *New York Times*, May 8, 2005, p. 20.

[42] See Internal Revenue Service Final Regulation §1.174-2(a)(1).

be recovered against taxable income over its expected economic life using an appropriate depreciation method rather than fully recovered in the year when the expenses are incurred.[43] But when the tax code treats R&D costs as a current expense rather than a capital expense, a subsidy arises in the form of a lower marginal effective tax rate on the returns to R&D investment. In fact, expensing reduces the marginal effective tax rate on the returns to investment in affected assets to zero.[44] This means that the user cost of capital for R&D investment is typically lower than for many alternative investments a firm might make, including purchases of new plant and equipment.

Pharmaceutical firms are likely to benefit more from this tax subsidy for R&D investment than most other firms because of their relatively strong propensity to invest in R&D. In 2000, according to estimates by the National Science Foundation (NSF), pharmaceutical firms plowed an estimated 9.8% of their domestic sales revenue into domestic R&D, compared to domestic R&D-to-domestic sales ratios of 3.4% for all firms, 3.3% for manufacturing firms, and 3.8% for non-manufacturing firms.[45] In the same year, pharmaceutical firms spent $12.2 billion on R&D, according to the NSF. Given that the average effective federal tax rate for the pharmaceutical industry was 32% in 2000, and assuming that the entire $12.2 billion in R&D expenses was eligible for expensing, the tax savings that year for the industry as a whole attributable to IRC section 174 may have totaled $3.9 billion.[46]

Expensing of Advertising Spending

Pharmaceutical firms also benefit from the tax treatment of outlays for business advertising. Under current law, advertising expenses are deductible in the year when they are incurred if they pass two tests: (1) they are reasonable in amount; and (2) they relate to a firm's lines of business. These expenses can serve the purposes of developing goodwill among customers or soliciting immediate sales.

There is a clear parallel between the tax treatment of outlays for advertising and outlays for R&D: both are expensed. It will be recalled that expensing leads to the taxing of any income generated by affected assets at a marginal effective rate of zero.

In the case of advertising, such tax treatment would be justified on economic grounds if advertising yielded no benefits for a firm lasting beyond the same year when it is done. Yet there is reason to think that some spending on advertising is equivalent to acquiring an intangible asset with an economic life greater than one year. In certain markets (including prescription drugs),

[43] Estimates of the rate of depreciation for R&D capital range from 15% to 30% per year. See James R. Hines, Jr., "No Place Like Home: Tax Incentives and the Location of R&D by American Multinationals," NBER Working Paper 4574 (Cambridge, MA: National Bureau of Economic Research, Dec. 1993), p. 7; and Bronwyn H. Hall and John van Reenen, "How Effective Are Fiscal Incentives for R&D? A Review of the Evidence," NBER Working Paper 7098 (Cambridge, MA: National Bureau of Economic Research, April 1999), p. 6.

[44] Because of the availability of a research tax credit, the marginal effective rate on a portion of business R&D investment is actually negative.

[45] National Science Foundation, Division of Science Resources Statistics, *Research and Development in Industry: 2000*, NSF 02-312 (Arlington, VA: May 2003), table A-20. The NSF definition of R&D covers compensation for researchers and the cost of materials, supplies, and overhead.

[46] It should be noted that this tax savings would not necessarily change if the R&D expenses had been depreciated according to a formula reflecting the economic lives of the intangible assets they created. But the savings would be spread out over a longer period, possibly a number of years, reducing its present value in current dollars.

advertising appears to generate intangible assets such as brand recognition and consumer loyalty, and these assets have the potential to boost a firm's sales and sustain them at levels they might not otherwise attain. For instance, Ernst R. Berndt and three colleagues found in a 1994 study of the U.S. market for anti-ulcer drugs that efforts by leading manufacturers to promote H_2-antagonists prescription drugs to physicians through detailing and medical journal advertising had "substantial effects" on the growth of domestic demand for the drugs and the sellers' market shares from 1977 to 1993.[47] In reaching this conclusion, they divided these marketing efforts into those aimed at expanding overall demand for H_2 antagonist drugs and those aimed at expanding the market shares of the leading sellers. They then estimated that the cumulative value of the marketing intended to expand overall demand depreciated at a rate of zero, but that the cumulative value of the marketing intended to expand market shares depreciated at an annual rate of close to 40%.[48] Other analysts have estimated that the depreciation rate for the intangible assets created by commercial advertising in general falls in the range of 20% to 30%.[49]

To the extent that advertising creates intangible assets with economic lives extending beyond one year, the immediate deduction permitted by current tax law favors investment in advertising over investment in assets with longer tax lives. What is uncertain, however, is the actual rate at which advertising loses economic value. There is conflicting evidence about the economic life of advertising in general, and the same evidence indicates that the depreciation rate may differ considerably by type of advertising (e.g., television advertising, magazine advertising, radio advertising).[50] As a result, it seems reasonable to conclude that it is uncertain to what extent the tax code subsidies investment in advertising.

Pharmaceutical firms are likely to benefit more from the expensing of advertising expenditures because of their relatively strong propensity to invest in advertising. In 2001, the pharmaceutical industry claimed deductions for advertising equaling 4.8% of business receipts; for all industries, the comparable ratio was 1.2%.[51] The industry claimed a total deduction of $10.5 billion for advertising in 2001, yielding a tax savings of $3.3 billion at the industry's average effective federal tax rate of 31.5% that year.

Federal Tax Policy and Pharmaceutical R&D

Tax policy is one of many channels through which the federal government influences the domestic climate for pharmaceutical innovation. In theory, tax law could bolster this climate by lowering a firm's user cost of capital and increasing its internal funds (or retained earnings) for such investment relative to other kinds of business investment.

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[47] Ernst R. Berndt, Linda Bui, David Reiley, and Glen Urban, "The Roles of Marketing, Product Quality and Price Competition in the Growth and Composition of the U.S. Anti-Ulcer Drug Industry," Working Paper 4904 (Cambridge, MA: National Bureau of Economic Research, Oct. 1994), pp. 35. Detailing is the widespread industry practice of promoting drugs directly to physicians by sending marketing representatives to doctor offices and hospitals.

[48] Ibid., p. 36.

[49] See Mark Hirschey, "Intangible Capital Aspects of Advertising and R&D Expenditures," *Journal of Industrial Economics*, vol. 30, no. 4, June 1982, pp. 375-389.

[50] U.S. Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (Washington: GPO, 1997), p. 377.

[51] Internal Revenue Service, Statistics of Income Division, *2001 Corporation Source Book*, Publication 1053 (Washington).

The user cost of capital is the cost a firm incurs as a result of owning a tangible or intangible asset. It embraces both the opportunity cost of passing up other investments and the direct costs of ownership, such as depreciation, the acquisition cost of the asset, and taxes. In general, the user cost of capital indicates the rate of return an investment project must earn in order to be profitable. As a firm's user cost of capital declines, the number of investment projects it can profitably undertake increases, all other things being equal. Empirical research indicates that business investment responds to changes in the user cost of capital, although the magnitude and stability of the response over the course of the business cycle are subjects of ongoing debate and research among economists.[52]

One factor affecting the user cost of capital is the tax burden on the return to an investment a firm makes. Generally, the lower this burden, the lower the cost of capital, all other things being equal.[53] A measure of this burden widely used by economists is the marginal effective tax rate. This rate, which is calculated by subtracting the after-tax rate of return on a new investment from the pre-tax rate of return and dividing by the pretax rate of return, reflects the statutory income tax rate faced by a firm, modified by any tax provisions that effectively reward and penalize the firm for making a particular investment.

Under current law, the federal tax burden on the returns to R&D investment could be relatively low because of two tax subsidies for such investment discussed earlier: (1) the tax credit for increases in research spending above a base amount under IRC section 41, and (2) the option to expense qualified research outlays under IRC section 174. In combination, they raise the after-tax rate of return on R&D investment relative to other investments a firm could make, such as purchases of plant or equipment or instituting a new training program for employees. In fact, the combined effect of the credit and the expensing allowance is to subject the returns to R&D investment to a negative rate of taxation, which is to say that after-tax rates of return exceed pre-tax rates of return.[54]

The same two tax subsidies can also boost R&D investment by increasing a firm's cash flow or supply of internal funds. Some firms base their annual R&D budgets on the amount of money they expect to have on hand after paying all expenses in a given year. For them, the cost of internal funds may be significantly lower than the cost of external funds, such as money raised through borrowing or issuing new stock. Small start-up firms are particularly likely to find themselves in this position because potential investors or lenders may lack the information needed to evaluate carefully their prospects for commercial success. A firm's supply of internal funds depends on how much it earns in profits and how much of those profits it must set aside to pay its income tax liability. Firms that rely heavily on retained earnings to finance new R&D investments should be able to invest more as their tax liabilities fall, all other things being equal. Of course, the increased cash flow could be used for many other purposes, including hiring new employees, training current employees, or paying higher dividends to shareholders.

[52] Harvey S. Rosen, *Public Finance*, 6th edition (New York: McGraw-Hill/Irwin, 2002), p. 409.

[53] For a discussion of the impact of taxes on the user cost of capital, see Jane G. Gravelle, "Cost of Capital," in *The Encyclopedia of Taxation and Tax Policy*, Joseph J. Cordes, Robert D. Ebel, and Jane G. Gravelle, eds. (Washington: Urban Institute Press, 1999), pp. 68-70.

[54] See CRS Report 95-871 *S, Tax Preferences for Research and Experimentation: Are Changes Needed?*, by William A. Cox.

There are no studies assessing the impact of current federal tax law on the incentive to invest in pharmaceutical R&D. But the seemingly weak effect of the research tax credit on domestic spending on this R&D noted earlier (see "Research Tax Credit") does suggest that federal tax policy has little influence on this incentive.

A better indicator of the link between tax policy and pharmaceutical innovation might be the pharmaceutical industry federal tax burden as measured by average effective tax rates. In 2001, the industry's rate was nearly the same as the average rate for all industries. Nonetheless, the average pharmaceutical firm spends a much higher percentage of its revenue on R&D than the average firm. This contrast underscores the central role played by innovation in the growth and competitive dynamics of the pharmaceutical industry. Current tax law may have little impact on the incentive to invest in pharmaceutical R&D, but substantial increases in the industry's federal tax burden could affect its ability to invest in new drug development.

Legislation in the 108th Congress to Modify the Tax Treatment of Pharmaceutical Firms

A number of bills were introduced in the 108th Congress aimed in whole or in part at influencing certain aspects of industry behavior by changing its tax treatment.[55] It is conceivable that some of their sponsors were responding to the widespread disaffection among Americans with the pricing policies, profitability, and advertising strategies of the pharmaceutical industry. Many of these initiatives would have imposed tax penalties on pharmaceutical firms that failed to curb or jettison certain practices, or that engaged in certain activities (e.g., spending on direct-to-consumer advertising). A few would have given these firms robust tax incentives to achieve certain desired objectives, such as investing in domestic vaccine production.

Only one of these measures, H.R. 4520, became the focus of significant legislative action. The House passed the bill by a vote of 251 to 178 on June 17, 2004, and the Senate followed suit by approving an amended version (by substituting the revenue language from S. 1637) on July 15, 2004. An agreement between the conferees from the House and Senate was reached in early October, and the House approved the agreement on October 7, followed by the Senate on October 11. The version of H.R. 4520 signed into law by President Bush does not include a provision in the House-passed version modifying the orphan drug credit. But it does contain a number of provisions that have important implications for the future federal tax burden of the pharmaceutical industry, such as a phase out and repeal of the extraterritorial income exclusion for exports, a phased-in deduction for income arising from domestic production, and a temporary sizable cut in the U.S. tax rate on certain income earned abroad by subsidiaries of U.S.-based firms.[56]

[55] See H.R. 149, H.R. 354, H.R. 1733, H.R. 2038, H.R. 2640, H.R. 3155, H.R. 3758, H.R. 3865, H.R. 4520, H.R. 4899, S. 477, S. 2053, and S. 2307.

[56] For an overview of the American Jobs Creation Act of 2004, see CRS Report RL32652, *The 2004 Corporate Tax and FSC/ETI Bill: The American Jobs Creation Act of 2004*, by David L. Brumbaugh.

Legislation in the 109th Congress to Modify the Tax Treatment of Pharmaceutical Firms

The pricing of drugs and the profits and advertising strategies of major pharmaceutical firms remain key concerns in the 109th Congress. One bill related to this concern that would alter the tax treatment of many pharmaceutical firms has been introduced in the 109th Congress. H.R. 575 would deny a tax deduction for any amount spent by a business taxpayer on "direct-to-consumer" advertising of prescription drugs as of January 1, 2005.

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