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Federal Tax Benefits for Manufacturing: Current Law and Arguments For and Against

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Summary

Fueled in part by certain policy initiatives advocated by President Obama, a lively debate over whether additional federal assistance should be provided for manufacturing is taking place among some analysts and lawmakers. Several issues are central to the debate: (1) the contributions of manufacturing to the performance and growth of the U.S. economy, (2) whether the federal government should do more to promote the growth of the sector, and (3) if so, what measures would be likely to have the intended effect?

The federal government supports manufacturing in a variety of ways. This report focuses on the support provided through the federal tax code. Current federal tax law contains nine provisions with the potential to provide significant tax relief to firms primarily engaged in manufacturing. A few are targeted at manufacturing, while the others offer more benefits for manufacturers than for firms in most other sectors. The most important provisions, ranked on the basis of estimated foregone revenue, are the deferral of the active income of controlled foreign subsidiaries of U.S.-based corporations, the research tax credit, the expensing of outlays for research and experimentation, and accelerated depreciation for a variety of capital assets.

A number of proposals are being considered in the 114th Congress to expand federal tax benefits for the manufacturing sector. Some of the bills would create new tax incentives intended to increase domestic investment and job growth in manufacturing. Their prospects for passage have become intertwined with the growing debate in Congress over reforming the federal tax code. Most proponents of tax reform favor an approach that would combine a broadening of the income tax base (e.g., by eliminating certain business tax incentives) with a lowering of corporate and individual tax rates, in a revenue-neutral fashion. Such an approach could have a significant effect on the taxes paid by many manufacturing companies.

Proponents of boosting federal assistance for manufacturing say the added support would benefit the U.S. economy in several important ways. In their view, a revitalized manufacturing sector might enable the United States to derive more of its economic growth from exports and domestic production than it has in the past two decades or so. Proponents also contend that average domestic wages would be likely to rise in response to growing manufacturing output, as manufacturing jobs historically have paid higher wages and benefits, on average, than have non-manufacturing jobs. In addition, according to proponents, a growing manufacturing sector would help lay a foundation for future U.S. economic growth, since manufacturing industries perform the vast share of private-sector research and development (R&D), which fuels the innovation that serves as a primary engine of economic growth. Finally, proponents argue that the United States would lose its long-standing leadership in advanced manufacturing technologies in the absence of increased federal support for manufacturing R&D and worker training.

Critics of greater federal assistance for manufacturing maintain that there is no economic justification for additional support. In their view, in the absence of a market failure linked to goods production in general, government aid for manufacturing should be decreased or eliminated, not increased. Critics also say that promoting job growth in manufacturing would do little to create the millions of jobs needed to bring domestic full-time employment back to the levels that prevailed on the eve of the severe recession from 2007 to 2009. And, say critics, U.S. gross domestic product and employment would receive a greater boost from federal initiatives to dismantle foreign barriers to expanding exports of services than from targeted assistance aimed at boosting the competitiveness of U.S. manufacturing companies.

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Introduction

In his 2013 State of the Union speech, President Obama stated that "our first priority is making America a magnet for new jobs and manufacturing."[1] The President was signaling that a revitalized manufacturing sector was a key element of his strategy for promoting faster U.S. economic growth.

Recent calls to use government policy to revive the U.S. manufacturing sector, particularly the companies involved in developing and making advanced technology products, have re-kindled a debate among lawmakers, economists, and other analysts over the desired economic role of manufacturing and the proper role of the federal government in the sector's performance. In the current policy debate, differences of opinion have emerged that evoke the conflicting views that characterized the domestic debate over industrial policy in the late 1970s and early 1980s. Back then, proponents of government policies to promote the competitiveness of U.S.-based manufacturing companies argued that such support was warranted for two reasons. First, manufacturing contributed more to the performance and growth of the U.S. economy than any other sector. Second, the competitive gains made by foreign companies in a range of industrial markets in the 1970s and early 1980s were partly due to government support in their countries of origin.

But some saw little or no merit in that argument. In their view, what mattered most for future growth in jobs, real wages, and output was not government support for so-called strategic industries but public investments in the main forces propelling rises in the standard of living in the long run: worker skills, education, research and development (R&D), and the economic infrastructure. These critics said that industrial policies were unlikely to succeed because civil servants in general were no match for businessmen in identifying the new technologies that had a significant potential to generate large numbers of well-paying jobs in coming years.

The question of what role federal policy should play, if any, in reviving manufacturing has re-emerged as a policy issue in the 114th Congress, especially in the context of proposals to reform the federal income tax. Some critics of the current federal income tax contend that existing tax benefits for manufacturing underscore a critical problem with the system: that it is laden with special benefits that unevenly reduce effective tax rates and have the same budgetary effects as federal spending, except that the benefits are not subject to the scrutiny and oversight built into the congressional appropriations and authorization processes.

This report examines the provisions in current federal tax law that benefit most or many manufacturing firms.[2] More specifically, it identifies and describes those provisions and discusses

[1] See https://www.whitehouse.gov/the-press-office/2013/02/12/remarks-president-state-union-address.

[2] Federal support for manufacturing is spread among several agencies and lacks centralized control and coordination. The Department of Defense funds research on new product and process technologies through its Manufacturing Technologies Program and the Defense Advanced Research Projects Agency. Under its Industrial Technologies Program, the Department of Energy enters into partnerships with industries to improve their energy efficiency through the development of new process technologies. The National Institute for Standards and Technology (NIST) devotes about half of its annual budget to promoting improved competitiveness among small and medium-sized manufacturing companies through two programs: the Manufacturing Extension Partnership and the Engineering Laboratory. NIST also supports research in advanced manufacturing technologies through the Advanced Manufacturing Technology Consortia Program and the NIST Centers of Excellence program. In addition, the Obama Administration is proposing that Congress appropriate $1 billion through the NIST budget for a competitive grant program to establish a network of (continued...)

the main arguments for and against targeted federal support (tax and non-tax) for the manufacturing sector. To set the stage for these topics, the report begins with brief overviews of the economic contributions of the sector and existing federal non-tax support for manufacturing. The report will be updated as warranted by changes in federal tax law.

Manufacturing and the U.S. Economy

According to the North American Industrial Classification System (NAICS), the manufacturing sector consists of establishments that are primarily engaged in the transformation of materials, substances, or components into products.[3] Establishments in this case are the factories, plants, or mills that use power-driven machines and equipment to effect this transformation. But they also include individuals who transform materials, substances, and components into products by hand in their homes, as well as the multitude of small businesses that sell directly to the public items they make on their premises.

In general, the products made in manufacturing establishments are finished or semi-finished. The former are ready for consumption or final use, while the latter serve as inputs for the production of finished products. In the U.S. national income accounts, manufacturing is broken down into a series of sub-sectors (or industries) that reflects the links among companies as a result of the production process. Basically, the output of some manufacturing companies becomes the inputs of others and vice versa. For example, makers of machine tools buy needed materials and components directly from producers of these items, and in some cases, the latter purchase machine tools from the former so they can produce those materials and components.

Nonetheless, the economic boundaries between manufacturing and other sectors sometimes are not clearly drawn, or even confusing. For example, the bottling and processing of milk and spring-fed water are regarded as manufacturing activities under the NAICS, although they involve no transformation of materials or components into a new product. On the other hand, the erection of an office building (including any fabrication performed at construction sites) is considered a construction activity, even though the final product is the result of a substantial transformative process.

Manufacturing's role in the U.S. economy has changed considerably since 1960. Back then, it accounted for 27% of real gross domestic product (GDP), 31% of non-agricultural employment, more than 20% of domestic non-residential fixed investment, nearly 99% of business investment in research and development (R&D), and 62% of exports. Since the 1970s, however, the manufacturing sector's economic contributions have declined sharply.

The extent of this decline can be seen in **Figure 1**. Basically, it tracks the manufacturing sector's share of non-agricultural employment, gross domestic product (GDP), business investment in research and development (R&D), exports, and domestic investment in capital assets between

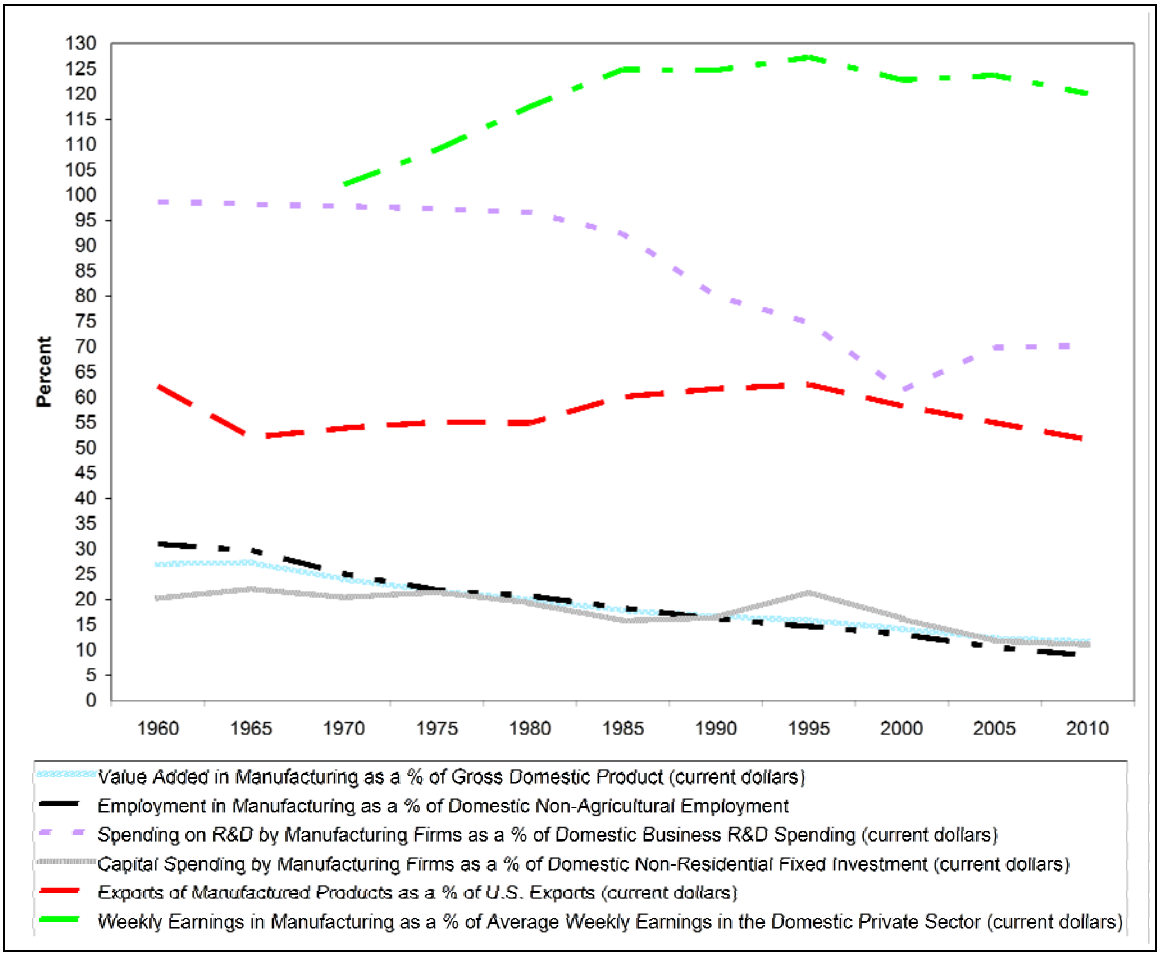
(...continued)

regional institutes for manufacturing innovation. In addition, the National Science Foundation funds a significant share of the federally supported basic research done at American colleges and universities. Some of the research funded by NSF has applications in manufacturing; those funds are distributed largely through the Directorate for Engineering's Civil, Mechanical, and Manufacturing Innovation Organization.

[3] See http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=31&search=2012 NAICS Search.

1960 and 2010. Relative to 1960, manufacturing's share of exports in 2010 was 17% lower; its share of business R&D investment 29% lower; and its contribution to non-agricultural employment 71% lower. Except for non-agricultural employment, manufacturing's share shrank because the contributions of other sectors rose faster than those of manufacturing. In the case of employment, manufacturing's share declined because it lost workers while combined employment in other sectors grew, except during recessions of course.

Figure 1. Key Economic Indicators for Manufacturing, 1960 to 2010



Source: Congressional Research Service using data obtained from the Department of Commerce, the Department of Labor, and the National Science Foundation

Every indicator in **Figure 1** trended downward except one: employee wages and salaries. Labor compensation per employee in manufacturing was somewhat larger in 1960 than it was in most other sectors. That gap grew steadily until the mid-1990s; by 2010, it was 7% smaller than in 1995, but nearly 18% larger than in 1960. Still, wages and benefits were consistently higher in manufacturing than they were in several other sectors (e.g., construction, mining, transportation, and utilities) from 1960 to 2010.

Several trends related to the ones shown in **Figure 1** are worth noting. First, among all sectors, manufacturing held the largest share of GDP (measured in current dollars) until 1986, when the government sector's share surpassed it. Several other sectors have risen in importance since then,

and in 2010, government, finance, insurance, real estate, rental and leasing; and professional and business services each had larger shares than manufacturing.

Second, manufacturing had the largest share of non-agricultural employment among all sectors until 1989, when employment in the government sector topped employment in manufacturing. Since then, retail trade, professional and business services, education, health services, and leisure and hospitality have joined government as larger sources of employment than manufacturing.

Third, although payroll employment in manufacturing has fallen gradually since 1979, when it reached an all-time peak of 17.985 million, the sector's value added (in current dollars), which measures its contribution to GDP, grew by a factor of 11.9 from 1960 to 2013, when it reached an all-time peak of $1.8 trillion.

The divergent trends in manufacturing's contribution to GDP and its employment reflect the relatively robust labor productivity growth in recent decades within the manufacturing sector. From 1990 to 2000, output per hour of labor in manufacturing rose at an average annual rate of 4.3%, compared to a rate of 2.2% in all non-farm businesses.[4] The gap narrowed from 2000 to 2007, when the rate of growth for manufacturing fell to 3.7%, while the rate for the non-farm business sector rose to 2.6%. There was little difference between the two growth rates between 2007 and 2013: labor productivity grew at an average annual rate of 1.6% in manufacturing and 1.5% in non-farm businesses.

Figure 1 also does not address the diverse outcomes among manufacturing industries from 1960 to 2010. Depending on how finely the manufacturing sector is sub-divided, many different industries can be identified and analyzed. Under the NAICS, which federal agencies use to organize and report industry data, manufacturing encompasses durable goods and non-durable goods industries, and each group, in turn, is divided into 10 major industries. The performance of these 20 industries can be evaluated using some of the same indicators of economic importance.

A comparison of the change in full-time-equivalent (FTE) employment and real value added from 1998 to 2013 for major manufacturing industries reveals that their performance was remarkably uneven. Some grew or declined in importance more than others.[5] As the figures in **Table 1** show, FTE employment fell over the period in each of the industries, but the extent of the decrease ranged from -7.2% for food, beverages, and tobacco products to -75.9% for apparel, leather, and similar products. The range was even greater for real value added. Of the 20 industries, real value added decreased for eight of them and increased for the other 12 between 1998 and 2013. The decreases ranged from -7.0% for plastics and rubber products to -50.2% for apparel, leather, and similar products, while the increases extended from 1.5% for printing and related support activities to 561.2% for computers and electronic products. Rising foreign competition, offshoring, and the growth of the information economy were among the key forces driving these changes.

[4] See http://www.bls.gov/lpc/prodybar.htm.

[5] The comparison does not stretch back before 1998 because that is the first year for which the Bureau of Economic Analysis at the Commerce Department provided an estimate of FTE employment by industry.

Table 1. Percentage Change in Full-Time-Equivalent (FTE) Employment and Real Value Added[a] for Major U.S. Manufacturing Industries, 1998 to 2013

	Change in FTE Employment	Change in Real Value Added
Manufacturing	**-31.9%**	**30.1%**
Durable Goods Production	**-31.2%**	**38.1%**
Wood Products	-42.5%	-11.6%
Non-Metallic Mineral Products	-31.4%	-23.3%
Primary Metals	-38.1%	28.5%
Fabricated Metal Products	-18.8%	-17.9%
Machinery	-26.5%	4.8%
Computers and Electronic Products	-42.0%	561.2%
Electrical Equipment, Appliances, and Components	-37.7%	4.1%
Motor Vehicles and Parts	-34.9%	52.3%
Other Transportation Equipment	-15.1%	20.7%
Furniture and Related Products	-45.2%	-33.7%
Miscellaneous Manufacturing	-22.2%	37.0%
Non-Durable Goods Production	**-33.0%**	**-0.3%**
Food, Beverage, and Tobacco Products	-7.2%	7.4%
Textile Mills and Textile Products	-65.3%	-47.3%
Apparel, Leather, and Similar Products	-75.9%	-50.2%
Paper Products	-41.1%	-35.5%
Printing and Support Activities	-43.0%	1.5%
Petroleum and Coal Products	-9.1%	9.1%
Chemical Products	-19.3%	19.4%
Plastics and Rubber Products	-29.5%	-7.0%

Source: Compiled CRS from data obtained from the Bureau of Economic Analysis, U.S. Department of Commerce; see http://www.bea.gov/iTable/iTable.cfm?ReqID=5&step=1 for more details.

a. Value added for an industry measures its contribution to gross domestic product. It is equal to the sum of labor compensation, taxes on production, imports less government subsidies, and gross operating surplus. Basically, value added represents the difference between an industry's gross output (consisting of sales or receipts and other operating income, commodity taxes, and inventory change) and the cost of its intermediate inputs, including energy, raw materials, semi-finished goods, and services purchased from all sources.

Federal Policy and the Manufacturing Sector

Federal support for manufacturing encompasses a number of tax and non-tax subsidies. The tax benefits are discussed in the following section, while this section describes the other kinds of assistance.

Non-Tax Assistance

Several federal programs assist manufacturing firms of all sizes outside the federal tax code.[6] The assistance mostly focuses on workforce training, export promotion, business counseling, and technology development. Foremost among the programs are the Department of Commerce's (DOC) National Institute of Standard's (NIST) Hollings Manufacturing Extension Partnership program (MEP), which was established in 1988 and provides technical assistance to small and medium-sized manufacturers to help them become more competitive and productive, and the Advanced Manufacturing Partnership (AMP), which was launched in June 2011 and uses federal funds to leverage the creation of partnerships among businesses, universities, and federal, regional, and state government agencies for the purpose of developing and encouraging the use of advanced manufacturing technologies.

A variety of other programs with smaller budgets at DOC, the Department of Energy (DOE), the Department of Defense (DOD), and the National Science Foundation (NSF) also support manufacturing, mainly by fostering the development of new manufacturing technologies tailored to the missions of those agencies.

There is no readily available estimate of the total amount of federal spending on non-defense programs to support the manufacturing sector. Generating such an estimate is difficult in part because the support is delivered through direct and indirect channels. Direct support comes in the form of programs that target most or all of their resources to manufacturing firms. A case in point is the MEP, which provides technical assistance to small and medium-sized manufacturing firms only. As a result, it is relatively easy to determine the amounts budgeted or spent through the program.

But such is not the case with all the federal programs that indirectly support manufacturing. The main difficulty lies in accounting for the dollar value of such support, which can be defined as federal industrial assistance that is not targeted at manufacturing but nonetheless benefits a significant number of manufacturers. No such problem arises in the case of the research tax credit under section 41 of the federal tax code. Although it is not limited to manufacturing firms, they are by far the biggest users of the credit among all sectors. Data on claims for the credit by industry and sector are available through the IRS website. But a similar breakdown does not exist among the programs administered by the Small Business Administration (SBA). While many small manufacturers have benefited from those programs over the years, it is unclear to what extent.

Still, lawmakers might find it useful to have an accurate and detailed breakdown of non-tax federal support for manufacturing that has nothing to do with national defense.

[6] See Nisha Mistry and Joan Byron, *The Federal Role in Supporting Urban Manufacturing*, Brookings Institution, Pratt Center for Community Development, April 2011, p. 34.

The bulk of direct federal non-tax support for manufacturing appears to consist of funding for research and development (R&D). According to the most recent figures on industry spending on R&D issued by the NSF's National Center for Science and Engineering Statistics, the federal government funded an annual average of $24.4 billion of the defense and non-defense R&D performed by U.S. manufacturing companies in 2011 and 2012.[7] Moreover, President Obama's FY2016 budget request for federal R&D calls for $2.4 billion for R&D targeted at advanced manufacturing technology; this support that would be delivered through programs at NSF, DOE, DOD, DOC, and other federal agencies.[8] If enacted, MEP would receive $130 million and $15 million would go to fund the activities of advanced manufacturing technology consortia.[9] The proposal includes funding to continue the construction of a national network of 45 manufacturing innovation institutes over 10 years. Nine institutes have been funded so far, and the proposal calls for spending $150 million in FY2016 to establish another seven such institutes. Each focuses on developing and commercializing different manufacturing technologies with broad applications through the collaborative efforts of local companies, universities, and technical institutes, and federal agencies.[10]

Tax Assistance

Before examining current federal tax assistance for manufacturing in detail, it is useful first to explain what a tax preference is. Such a preference (which many also refer to as a tax break, tax benefit, or tax expenditure) is a provision in the federal tax code that grants special tax relief to eligible individual or business taxpayers. The tax relief is mainly intended to promote certain policy goals. For instance, the tax credit under section 41 for increasing research expenditures seeks to increase U.S. investment in innovation, a crucial source of long-term economic growth and a key element in the competitiveness of U.S. businesses that compete with foreign companies in domestic and foreign markets. In some cases, however, the tax relief is intended to help struggling businesses improve their financial condition. Regardless of intent, the tax reduction from the preferences is considered special because it represents a departure from what the Congressional Budget and Impoundment Control Act of 1974 (P.L. 93-344) calls "normal income tax law."

Tax preferences can take any of the following forms: (1) exclusions, exemptions, or deductions, which reduce an eligible taxpayer's taxable income; (2) preferential tax rates, which apply lower rates to some or all of an eligible taxpayer's taxable income; (3) credits, which reduce an eligible taxpayer's tax liability; and (4) tax deferrals, which postpone the recognition of income for tax purposes or accelerate the recognition of expenses that normally should be deducted in future years.

All things being equal, tax preferences also reduce the tax revenue flowing into the U.S. Treasury. For any tax preference, that revenue stream would be larger if the preference did not exist. As a

[7] Raymond M. Wolfe, *Business R&D Performed in the United States Tops $300 Billion in 2012*, InfoBrief, National Center for Science and Engineering Statistics (Arlington, VA: Oct. 2014), table 2, p. 2.

[8] See Office of Management and Budget, *Fiscal Year 2016 Budget of the U.S. Government: Analytical Perspectives* (Washington: GPO, 2015), p. 293.

[9] See CRS Report R43908, *The National Institute of Standards and Technology: An Appropriations Overview*, by (name redacted), Appendix B, p. 20.

[10] For more details on the National Network for Manufacturing Innovation, see CRS Report R42625, *The Obama Administration's Proposal to Establish a National Network for Manufacturing Innovation*, by (name redacted)

consequence, budget experts tend to view tax preferences as federal spending through the tax code. This explains why tax preferences are also known as tax expenditures. Some contend that permanent tax preferences operate in the same way as entitlement programs do: in both cases, benefits are distributed or paid to qualified persons or corporations with no time limit.[11]

The federal tax code contains numerous provisions granting preferential treatment to companies in a range of industries. In recent years, congressional oversight of business tax benefits generally has been limited to periodic legislation to extend certain temporary benefits that have expired or are about to expire. Permanent business tax benefits, by contrast, have received less attention.

Table 2 shows the tax preferences from which manufacturing companies derive the most benefit. The figures apply to corporate and non-corporate businesses. Since not every tax preference is designed to benefit manufacturing firms only, two methods are used to identify the most beneficial preferences. One is the share of the total amount of claims for a tax preference accounted for by manufacturing firms. The other is the design of a preference and the extent to which manufacturing firms as a whole would be likely to benefit from it, given their lines of business. Of the tax preferences listed in **Table 2**, only one arguably is designed to benefit the manufacturing sector more than others: the deduction for "domestic production activities" income under Section 199 of the federal tax code. While companies in several other industries benefit to varying degrees from the deduction and the other preferences shown in the table, it is likely that they do not benefit to the same extent as do firms primarily engaged in manufacturing activities.

Several of the tax preferences are intended to stimulate increased investment in qualified research (Sections 174 and 41) and in equipment and software (Sections 168 and 179). They do so by reducing the cost of capital and boosting cash flow for firms undertaking such investments. Tax subsidies for investment in research are justified on the grounds that they seek to correct a market failure associated with R&D investment. In theory, companies are assumed to invest too little in research and development (R&D) relative to its social returns, because they cannot capture all the returns. But a similar rationale may not apply to tax subsidies for capital investment. Economists have found no evidence indicating that investment in capital assets like factories and equipment is subject to a similar market failure; rather, firms generally appear to capture most of the returns. Governments typically have adopted investment tax subsidies as a countercyclical measure during economic downturns. The federal government did so in response to the Great Recession of 2007 to 2009 by extending and increasing the bonus depreciation allowance under Section 168(k) and enhancing the expensing allowance under Section 179.

With one exception, the other tax preferences shown in the table encourage the following activities: increased domestic investment and expansion by manufacturing firms (Section 199); a larger flow of equity capital to small, young manufacturing firms (Section 1202); greater cash flow among manufacturing firms of all employment sizes (Sections 491, 492, and 168(k)(4)); and increased U.S. exports of manufactured products (Sections 861, 862, 863, and 865).

The exception is the first preference in the table: the deferral of the active income of controlled foreign corporations (CFCs) under Section 11(b). It is the only tax provision from which U.S.-based manufacturing firms derive significant benefits that encourages them to invest outside the United States, especially in countries with lower tax rates than the United States. A CFC is a

[11] U.S. Congress, Senate, Committee on the Budget, *Tax Expenditures: Compendium of Background Material on Individual Provisions*, 111th Cong., 2d sess., S. Prt. 111-58 (Washington: GPO, December 2010), p. 3.

foreign corporation in which U.S. shareholders own 50% or more of its total voting power or the total value of its stock on any day of a tax year. The federal government taxes U.S.-chartered corporations on their worldwide income. Section 11(b) permits U.S.-based corporations with CFCs to postpone indefinitely U.S. taxation of their subsidiaries' earnings while the earnings remain in the control of the CFCs and are reinvested abroad. A U.S. parent corporation pays federal tax on its subsidiaries' earnings only when they are repatriated as intra-firm dividends or certain other kinds of income. That tax is reduced by a U.S. credit for any income taxes the subsidiaries paid to the host countries on the same earnings; the credit is intended to avoid the double taxation of foreign-source income under the federal tax code. The option for deferral and the availability of the foreign tax credit give U.S. firms an incentive to establish operations with their own profit centers in countries with relatively low tax rates.

While any U.S.-chartered corporation with one or more CFCs can benefit from deferral, there is evidence that corporations engaged primarily in manufacturing have been major beneficiaries. A case in point is the corporate response to a temporary reduction in the U.S. tax rates for repatriated earnings under the American Jobs Creation Act of 2004 (P.L. 108-357). The act allowed U.S. corporations to take a one-time deduction equal to 85% of any increase in their repatriated foreign-source income in either their first tax year beginning on or after the date of enactment or their last tax year beginning before that date. For companies subject to a corporate income tax rate of 35%, the deduction lowered the effective rate on the repatriated income to 5.25%. Credits for foreign taxes paid on the repatriated earnings were reduced by the same amount. To claim the deduction, companies had to establish a domestic investment plan for the repatriated funds. In addition, the deduction was limited to the greater of $500 million or the amount of earnings shown on a firm's books permanently invested outside the United States as of June 30, 2003. According to the House and Senate conference report on the act, the temporary tax reduction was intended to stimulate increased business investment and hiring and would not be extended or enacted again anytime soon.[12] In a 2008 report on the one-time dividends received deduction, the Internal Revenue Service (IRS) noted that manufacturing corporations filed 55% of the returns for the 2004 to 2006 tax years claiming the deduction and accounted for 81% of all qualifying dividends.[13] Nearly half of all qualifying dividends were repatriated by firms in the pharmaceutical, electronic, and computer industries.

[12] U.S. Congress, Conference Committee on the American Jobs Creation Act of 2004, conference report to accompany H.R. 4520, H.Rept. 108-755, 108th Cong., 2nd sess. (Washington: GPO, 2004), p. 314.

[13] Melissa Redmiles, *The One-Time Received Dividend Deduction*, Statistics of Income Bulletin, Washington, DC, Spring 2008, available at http://www.irs.gov/pub/irs-soi/08codivdeductbul.pdf.

Table 2. Federal Tax Provisions That Provide Significant Benefits to Manufacturing Firms

Tax Provision	Code Section(s)	Current Status	Total Estimated Revenue Cost for All Users in FY2015	Benefit to Manufacturing Firms
Deferral of active income of controlled foreign corporations	11(d)	Permanent	$82.1 billion	• U.S.-based manufacturing corporations account for a substantial share of the accumulated earnings and profits held by the foreign subsidiaries of U.S. multinational corporations. • Provision allows U.S. parent companies to defer U.S. tax on income earned and reinvested by their foreign subsidiaries until the income is repatriated as dividends. • Provides an incentive to establish subsidiaries in countries with corporate tax rates lower than U.S. rates.
Research and experimentation tax credit	41	Temporary: expired at the end of 2014	$4.7 billion (There is no estimate of the revenue effects of the credit for FY2015 because the credit expired at the end of 2014 and has not been extended. A bill passed by the House in May 2015 (H.R. 880) would permanently extend and simplify the credit. An estimated $4.7 billion in revenue would be forgone because of the credit in FY2105.)	• Provision allows firms a tax credit equal to as much as 20% of qualified research spending above a base amount. • As a result, it can lower after-tax cost of qualified research, encouraging more investment for that purpose. • Manufacturing accounted for 69% of the total value of claims for the credit by corporations in the 2008 and 2009 tax years combined.
Expensing of research and experimental expenditures	174	Permanent	$5.1 billion	• Provision allows firms to deduct spending on qualified research as a current expense, rather than as a capital expense. • This treatment lowers the marginal effective tax rate on returns to investment in such research. • According to data published by the National Science Foundation,

Tax Provision	Code Section(s)	Current Status	Total Estimated Revenue Cost for All Users in FY2015	Benefit to Manufacturing Firms
				manufacturing firms performed or funded 64% of domestic basic and applied research in 2007.
Depreciation of equipment and buildings (excluding rental housing) in excess of the alternative depreciation system (Section 167)	168 and 179	Section 168: permanent Section 179: permanent, though the maximum allowance and phase-out threshold can vary from year to year	$32.6 billion	• Section 168 generally allows firms to recover the cost of qualified assets sooner than they can be recovered under the alternative depreciation system in section 167. • Section 179 makes it possible for firms to expense a limited amount of the cost of qualified assets placed in service in a tax year. • Full (or 100%) expensing imposes a 0% marginal effective tax rate on returns to investment in affected assets. • Though data on investment by industry in equipment and software are not readily available, it is likely that manufacturing firms account for a major share of total investment in those assets, especially equipment.
Deduction for qualified domestic production activities income	199	Permanent	$17.2 billion	• Provision allows firms to deduct 9% of qualified domestic production activities income; the deduction is 6% for activities related to oil and gas production; the deduction cannot exceed a firm's taxable income or 50% of wages linked to those activities. • Qualified activities encompass manufacturing, mining, film production, energy, construction, engineering, and architectural services. • Deduction lowers the top marginal tax rate on income earned from commercial use of favored property from 35% to 31.85%. • In 2008, according to IRS data, manufacturing accounted for 66% of the total value of claims for the domestic production activities deduction by corporations.
Partial exclusion on gains from the sale or exchange of qualified small business stock	1202	Permanent	$0.9 billion	• Provision allows non-corporate taxpayers to exclude from gross income 100% of any gain from the sale or exchange of qualified small business stock acquired after September 27, 2010, and before January 1, 2014; the exclusion reverts to 50% for stock

Tax Provision	Code Section(s)	Current Status	Total Estimated Revenue Cost for All Users in FY2015	Benefit to Manufacturing Firms
				acquired on or after January 1, 2014. • To qualify for this treatment, a taxpayer must acquire the stock at original issue and hold it for a minimum of five years. • Qualified small business stock must be issued by a C corporation with no more than $50 million in gross assets when the stock is issued. • At least 80% of the assets must be used in a qualified trade or business (including manufacturing) during most of the required five-year holding period. • Provision is intended to expand access to equity capital by small start-up C corporations that may otherwise have trouble attracting such capital. Large corporations do not benefit from the exclusion.
Inventory accounting: use of the last-in, first-out (LIFO) method	472	Permanent	$1.8 billion	• Provision allows taxpayers that must maintain inventory records in order to account for the cost of goods sold to exclude any increase in the value of goods they buy or produce from taxable income. • LIFO is most beneficial to firms facing rising costs for the goods in their inventories. • Research indicates that the vast share of firms that use LIFO for tax purposes are involved in manufacturing. • Provision enables taxpayers to reduce the tax burden on the difference between the sales price and cost of inventories. • It also creates beneficial tax planning opportunities that do not exist with the first-in, first-out (or FIFO) method of inventory accounting.
Inventory property sales source rule exception	861, 862, 863, and 865	Permanent	$3.0 billion	• Provision allows U.S. exporters an exception to the rule that income is sourced according to the residence of the seller. • Under the exception, inventory that is bought and then re-sold is governed by a rule known as the "title passage" rule. • The rule sources income from the sale in the country where the sale occurs.

Tax Provision	Code Section(s)	Current Status	Total Estimated Revenue Cost for All Users in FY2015	Benefit to Manufacturing Firms
				• Inventory that is made and sold by the company is treated as having a divided source: half of the income from a sale is sourced in the United States and half in the country where the sale occurs. • U.S. companies with excess foreign tax credits may use them to reduce U.S. taxes if they can shift income from U.S. sources to foreign subsidiaries. • Companies with excess foreign tax credits can take advantage of the inventory sales source rule exception to increase the amount of their credits that can be applied against their U.S. income tax liability. This has the same effect as exempting from U.S. taxation the income that was sourced in another country as a result of the exception. • The source rule exception for inventory sales probably raises the rate of return from investing in exporting. • Manufacturers account for two-thirds of U.S. exports of goods and services.

Source: Compiled by CRS from data provided in U.S. Congress, Joint Committee on Taxation, *Estimates of Federal Tax expenditures for Fiscal Years 2014-2018, JCX-97-14* (Washington: GPO, August 5, 2014).

Arguments For and Against Federal Support for Manufacturing

The current debate over whether to expand federal support for manufacturing is reminiscent of the lively (and at times acrimonious) debate over industrial policy that influenced the formulation and implementation of U.S. economic policy in the 1980s. In both cases, a primary concern was and is the short- and long-term economic consequences of a sustained decline in the domestic manufacturing base driven largely by increasing foreign competition in key global markets, particularly those for advanced technology products.

Proposals to enhance federal support for manufacturing raise a number of policy issues. One is the economic rationale for such support. If such support can be justified on economic grounds, then the case for retaining or enhancing existing support becomes harder to refute, dismiss, or ignore.

The question of whether federal assistance for manufacturing is justified on economic grounds also has noteworthy implications for the debate in the 114th Congress over reforming the federal tax code. Several proposals to expand federal support for manufacturing have been introduced, a

few of which include new or expanded targeted tax incentives.[14] In effect, these incentives would increase the after-tax rate of return on investments by manufacturing companies, relative to the after-tax rate of return on investments by non-manufacturing companies, other things being equal. While the relative rates of return on business investments is only one of the forces shaping the domestic allocation of economic resources, it could divert to manufacturing businesses some of the capital that otherwise would flow into non-manufacturing businesses. Such an outcome would appear to run counter to some of the commonly held general aims of tax reform proponents. These include a revenue-neutral simplification of the federal income tax through a reduction or repeal of certain individual and business tax preferences in exchange for tax rate cuts, and the elimination of tax preferences that distort the allocation of resources in the U.S. economy in ways that hamper its growth. Current or proposed tax-based support for manufacturing raises the question of how Congress could reconcile such support with those aims. Such a task may be easier if there is an economic justification for targeted federal subsidies for manufacturing industries.

Argument for Targeted Government Assistance for Manufacturing

Proponents of targeted government assistance for manufacturing offer several arguments to justify it. The arguments are largely based on the sector's current and historical contributions to the U.S. economy. More specifically, they focus on the importance of manufactured products to U.S. exports, the wages and benefits available in the manufacturing sector, the role of manufacturing in technological innovation, the links between manufacturing and other sectors, and actions taken by other countries to support manufacturing. Each is examined below.

Driver of Export Growth

The case for greater federal aid for manufacturing rests in part on a view held by a number of economists that the United States would be better off relying less on consumption and imports financed by foreign borrowing to grow its economy and relying more on domestic production of goods and exports. Manufactured products (mainly chemicals, transportation equipment, computers and other electronic products, and machinery) accounted for 49% of all U.S. exports and 68% of all U.S imports in the first four months of 2015.[15] Proponents of more federal support for manufacturing maintain that these figures demonstrate that manufacturing has to play a leading role in any credible plan for reducing the U.S. trade deficit. In their view, the federal government should launch renewed efforts to dismantle the remaining barriers in key countries to the export of U.S. manufactured products and persuade major exporting nations like China to adopt more flexible exchange rate regimes. They also call for the adoption of federal initiatives to bolster the competitiveness of U.S. manufacturers through subsidized investments in workforce development, new production facilities, and R&D.

[14] See H.R. 255, H.R. 1852, H.R. 2000, H.R. 2608, and S. 1054.

[15] See U.S. Department of Commerce, Census Bureau and Bureau of Economic Analysis, *U.S. International Trade in Goods and Services: April 2015*, press release, June 3, 2015, available at http://www.census.gov/foreign-trade/Press-Release/current_press_release/ft900.pdf.

Source of Relatively High Wages and Benefits

Proponents also point to the wages and benefits provided by manufacturing firms as another reason why targeted government support for manufacturing industries is warranted. This is because the compensation paid workers in manufacturing is larger, on average, than the labor compensation provided in other non-agricultural industries (see **Figure 1)**, though the gap has been shrinking over time. Estimates of the size of the pay gap vary. For instance, between 2005 and 2010, according to data from the Bureau of Labor Statistics, average weekly earnings in manufacturing were 21% greater than average weekly earnings in all private non-agricultural industries. By contrast, according to a recent study by Mark Price of the Keystone Research Center, manufacturing workers earned 8.4% more each week than non-manufacturing workers from 2008 to 2010.[16] There is evidence that this gap is even larger for manufacturing firms that have relatively high ratios of exports to total production.[17] Not all non-manufacturing industries pay less than the average wage in manufacturing. But the ones that do pay more, according to Price's research findings, such as mining, utilities, telecommunications, finance, insurance, professional and technical services, hospitals, and public administration, accounted for only 21% of total non-manufacturing workers. Price also found that low-wage workers benefitted the most from manufacturing jobs and high-wage workers benefitted the least, suggesting that manufacturing has the potential to lower wage gaps among workers.

Moreover, proponents note that manufacturing jobs are more likely to provide fringe benefits than non-manufacturing jobs, and that a higher share of manufacturing workers (48%) have no formal education beyond a high-school diploma than non-manufacturing workers (37%) do.[18] Consequently, say proponents, added federal support for manufacturing could open up more middle-income job opportunities and lower income inequality within the domestic workforce.

Critical Source of New Commercial Technologies

Proponents cite the myriad links between manufacturing and technological innovation as yet another reason why federal policy should offer special support for manufacturing firms. According to data from the National Science Foundation (NSF), in 2012, manufacturing firms as a whole performed 69% of the business R&D conducted in the United States and employed 60% of the workers involved in domestic business R&D.[19] Since technological innovation serves as the principal engine of long-term growth in both productivity and the economy, proponents maintain that the federal government should adopt policies that encourage manufacturers to conduct more of their R&D in the United States. According to NSF data, U.S.-based multinational manufacturing companies conducted an estimated 76% of their worldwide R&D in

[16] Susan Helper, Timothy Krueger, and Howard Wial, *Why Does Manufacturing Matter? Which Manufacturing Matters?* Metropolitan Policy Program, Brookings Institution, February 2012, p. 4.

[17] A 2010 study by David Riker from the International Trade Administration at the U.S. Department of Commerce found that workers in export-intensive manufacturing industries earned 18% more, on average, than workers in other manufacturing industries from 2006 to 2008. See David Riker, *Do Jobs In Export Industries Still Pay More? And Why?*, Manufacturing and Services Economics Brief, Department of Commerce, International Trade Administration, July 2010, p. 5.

[18] Ibid., p. 5.

[19] Raymond M. Wolfe, *Business R&D Performance in the United States Tops $300 Billion in 2012*, National Science Foundation, National Center for Science and Engineering Statistics, InfoBrief, NSF 15-303 (Arlington, VA: Oct. 2014), Tables 2 and 3.

the United States in 2011, the most recent year for which figures are available.[20] But this share may have declined since then, as some of these companies have transferred part of their R&D operations to Asia to take advantage of markets with strong growth potential, plentiful supplies of well-educated and well-trained researchers and engineers willing to work at salaries below average U.S. salaries for comparable work, and generous government subsidies.

Major Player in the Development of Clean-Energy Technologies

Proponents say the manufacturing sector makes a "disproportionately large" contribution to the development and production of goods and services with clear environmental benefits. A 2012 report by the Brookings Institution estimated that 26% of the 2.7 million jobs in the "clean economy" are in the manufacturing sector, even though those jobs represented only 9% of private-sector jobs.[21] Proponents also note that numerous green technologies and products are made by manufacturing firms, including electric vehicles, water-efficient products, energy-efficient appliances, and environmentally friendly chemical products. In their view, these contributions suggest that a competitive, growing manufacturing sector is needed to provide the United States with the workforce skills, engineering talent, and innovative capabilities required to meet the twin technological challenges of producing more clean energy and reducing the use of energy derived from fossil fuels. Proponents argue that special federal assistance for domestic development and production of new and advanced green technologies is critical to the achievement of these goals.

Linkages to Other Industries

Backers of targeted government assistance for manufacturing industries also cite the role they play in the growth of other industries as another justification for this assistance. This role has two critical aspects.

One is the impact of manufacturing output on the collective output of other sectors, or what is known as the multiplier effect of the demand for manufactured products. Proponents point out that there is evidence that the manufacturing sector exerts a stronger pull on overall output than any other sector. One measure of this pull is a sector's backward linkage in the input-output structure of an economy. This linkage refers to the impact on the output of supplying sectors such as raw materials, services, construction, and energy of the level of output in another sector. As a sector's backward linkages expand, at least in the short run, its influence on overall output grows as well. According to an analysis by the Manufacturing Institute of input-output data 2012 for all sectors in 2012 from the U.S. Bureau of Economic Analysis, $1.00 of final demand for manufactured products led to $1.33 in output from all other sectors combined. Agriculture, forestry, hunting, and fishing: had the second largest backward linkage: $1.00 in final demand resulted in $1.11 in output from all other sectors.[22]

[20] National Science Foundation, National Center for Science and Engineering Statistics, *Business Research and Development Innovation: 2011*, NSF 15-307 (Arlington, VA: 2014), Table 4.

[21] Helper, Krueger, and Wial, *Why Does Manufacturing Matter?* p. 14.

[22] Manufacturing Institute, *Manufacturing's Multiplier Effect is Stronger than Other Sectors*, available at http://www.themanufacturinginstitute.org/Research/Facts-About-Manufacturing/Economy-and-Jobs/Multiplier/Multiplier.aspx.

The second aspect concerns the contribution of manufacturing firms to the domestic climate for industrial innovation in general, and to the growth and competitiveness of certain non-manufacturing industries in particular. Proponents maintain that product innovations in manufacturing have had a major impact on the growth prospects for firms that use those innovations in a variety of non-manufacturing industries. A case in point is the productivity gains and other benefits in industries that invest in information technologies. Furthermore, say proponents, manufacturing creates and supports numerous well-paying jobs in product and process engineering, design, operations and maintenance, transportation, testing, R&D, payroll, accounting, and legal work. In their view, the loss of domestic manufacturing jobs and production through offshoring and plant closures diminishes the domestic ability to innovate, stunting the ability of the U.S. economy to generate new well-paying jobs in a range of sectors. Thus, according to proponents, targeted government support (particularly in the form of private-public partnerships focused on technology development) is needed to ensure that the United States sustains and grows this ability through the creation of "industrial commons", which are geographically based hubs where complementary manufacturing, engineering, and R&D activities coalesce to allow participating firms to develop new technologies and bring them to the market.[23]

Other Developed Countries Support Manufacturing

Yet another argument made in support of federal policies to assist manufacturing is that other countries do so, some with notable success.[24] According to some proponents, the exemplar is Germany. In their view, the federal government would achieve better results with its targeted assistance for manufacturing if it were to emulate German policy toward manufacturing. Compared to the United States, Germany has achieved superior outcomes in manufacturing in recent years, as exemplified by higher wages, a slower rate of job loss, and large trade surpluses. Some attribute these results in part to public policies that have fostered the emergence and growth of German R&D networks. Among other things, these networks have aided the growth and competitiveness of the manufacturing sector by supporting a system of continuous vocational training tied to industry needs, promoting stable access to finance for small and mid-sized German companies, and encouraging the rise of collaborative systems involving unions and companies for making important decisions on issues not subject to collective bargaining. Proponents of greater federal support for manufacturing point to the German example as proof that public policy can address the basic challenges facing the manufacturing sector in ways that help a country accomplish key policy objectives such as relatively high wages, increased technological innovation, larger trade surpluses, improved environmental protection, and greater energy conservation.[25]

[23] Michael Ettinger and Kate Gordon, *The Importance and Promise of American Manufacturing*, Center for American Progress (Washington: Apr. 2011), p. 5; and Massachusetts Institute of Technology, *A Preview of the MIT Production in the Innovation Economy Report* (Cambridge, MA: Feb. 22, 2013), pp. 27-29.

[24] For an assessment of the support for manufacturing offered by Australia, Canada, Germany, Japan, Spain, and the United Kingdom, see Information Technology & Innovation Foundation, *International Benchmarking of Countries' Policies and Programs Supporting SME Manufacturers* (Washington: September 2011). Available at http://www.itif.org/publications/international-benchmarking-countries%E2%80%99-policies-and-programs-supporting-sme-manufacturer.

[25] Helper, Krueger, and Wial, *Why Manufacturing Matters*, p.28.

A 2013 report by the Government Accountability Office (GAO) examined the support for the manufacturing sector offered by the national governments in Germany, as well as three other developed countries: South Korea, Japan, and Canada.[26] The report found that these countries provided a varied mix of programs to support manufacturing industries; it also found that there were some significant differences between those efforts and the support provided by the federal government. A common thread in all the programs (including those of the United States) was an emphasis on targeted support for innovation among small- and medium-sized manufacturing firms (SMFs).

South Korea supported its manufacturers through funding for a variety of national research institutes (including one focused on telecommunications and information technology), clean energy technology development, and a national network of "technoparks," which operated as regional innovation centers where companies (especially SMFs) could collaborate with researchers from the national research institutes and universities and local governments in the commercial development of new technologies.

The Japanese government took a number of steps from 2007 to 2012 to foster the formation and growth of SMFs, mainly through the creation of collaborative research centers involving larger businesses, universities, industry associations, financial institutions, research institutes, and government agencies. These steps included the adoption of the following initiatives: Innovation 25 in 2007; Industrial Cluster Project in 2011; and Rebirth of Japan strategies in 2011 and 2012. Among the efforts tied to the Rebirth of Japan strategies were increased public and private investment in alternative energy R&D projects such as clean-energy motor vehicles and improved battery performance for electric cars, and increased government support for technological innovation by SMFs through the creation of a national network of Public Industrial Technology Research Institutes.

And as of 2012, Canada relied on several initiatives to foster the growth of SMFs seeking to develop and commercialize new products and processes. One was the Canadian Innovation Commercialization Program, which helped SMFs take advantage of government procurement programs for leading-edge products, services, and technologies. A second initiative was the Industrial Research Assistance Program, which consisted of a national network of technical advisors who worked directly with SMFs to promote the commercialization of their new goods and services. Canadian manufactures also benefited from a tax credit for qualified investment in R&D (known as the Scientific and Experimental Development tax credit) and a government-funded program (known as the Venture Capital Action Plan) to encourage private investment in startup firms and to facilitate the creation of private venture capital funds.

Intended Recipients of Government Support

Proponents seem divided on the question of which firms should be eligible for government assistance for manufacturing. This is a significant issue for public policy because the sector consists of firms of different sizes and geographic reach in a range of industries that vary considerably in the products they make and the markets they serve. Under the NAICS, manufacturing embraces products as basic as bottled water and as sophisticated as nanotechnology. Some proponents argue that federal policy toward manufacturing should take

[26] U.S. Government Accountability Office, *Global Manufacturing: Foreign Government Programs Differ in Some Key Respects from Those in the united States*, GAO-13-365 (Washington: July 2013).

into account differences in financial condition and external economic benefits among industries involved in goods production in deciding which firms, technologies, or industries to support. Such an approach, in their view, would provide lawmakers with a clearer picture of the need for policies to encourage the migration of workers from declining to growing industries, remedy market failures that permit relatively inefficient firms to remain in business, and help small and medium firms to raise their productivity.[27] To assist manufacturing firms that are unlikely to improve their competitiveness, say proponents, would be a waste of taxpayer money. Others contend that the federal policy should target its assistance to bolster the "ability of enterprises to develop and manufacture high-technology products in America."[28]

Some call for a shift in government policy toward manufacturing so that special assistance is directed to small companies only. In their view, such a focus makes sense for two reasons. First, proponents of this limited approach point to evidence that young startup firms serve as "key drivers of employment and technology growth" but lag behind large firms in adopting "new technologies that would make them more productive."[29] Second, they argue that small and medium firms face special difficulties in gaining needed public information and advisory services, but that they play "critical roles" in supporting the competitiveness of large U.S. manufacturers.

Arguments against Targeted Government Assistance for Manufacturing

In spite of what appears to be a bipartisan consensus in favor of greater federal support for manufacturing, not everyone agrees that such assistance is warranted on economic grounds. Critics offer several reasons for their opposition to targeted government support for manufacturing. They can be summarized as follows: (1) the lack of any market failures linked to the performance of the manufacturing sector, (2) a sustained decease in the contributions of the manufacturing sector to job creation and GDP over the past 50 years, and (3) the untapped potential for growth in U.S. exports of services in which the United States may have a comparative advantage. Additional details on each are given below.

Absence of Any Market Failure

Critics say the main reason why government assistance for manufacturing cannot be justified on economic grounds is that the performance of the sector is not distorted by a market failure.

In general, a market failure is a condition or set of circumstances that prevents or hampers the emergence of an efficient allocation of resources within a particular market, such as the market for health insurance or passenger cars. Most economists would agree that when markets fail to generate efficient outcomes, government intervention is required to remedy the problem. For instance, if competition in a market is dominated by a few companies, antitrust laws can be used to lessen the welfare losses by curtailing the sellers' market power. The primary market failures

[27] Ibid., p. 15.

[28] Gary P. Pisano and Willy C. Shih, " Restoring American Competitiveness," *Harvard Business Review*, July-August 2009, p. 114.

[29] Stephen Ezell, "Revitalizing U.S. Manufacturing," *Issues in Science and Technology*, Winter 2012, available at http://www.issues.org/28.2/ezell.html.

involve public goods, externalities (positive and negative), a lack of competition, the absence of a market, incomplete and asymmetric information, and the principal-agent dilemma.[30]

This basic principle of economic analysis implies that government support for an industry is warranted only if a market failure is producing inefficient resource allocations within the industry. An example of such a distortion is sub-optimal investment in R&D or capital assets like buildings and equipment. Some say that manufacturing is prone to market failures resulting from three activities that are characteristic of manufacturing: R&D investment, clustering of firms in the same geographic area, and the process of learning by doing. But critics disagree with this assessment on the grounds that there is no clear evidence that these activities engender market failures that are unique to manufacturing.

One market failure some associate with manufacturing is inefficient levels of R&D investment. This linkage is not surprising, since the sector accounts for over two-thirds of the domestic R&D performed by companies, and companies are thought to invest too little in R&D because of their inability to capture all the returns from those investments.[31] The returns captured by entities other than the innovator (i.e., other companies and consumers) represent the positive externalities or spillovers from R&D investments. Though there is reason to believe that manufacturing is affected by this market failure more than other sectors, the problem is bound to arise in any sector where companies invest in R&D. Numerous non-manufacturing firms, such as those involved in software development and Internet access (e.g., Microsoft and Google), invest substantial amounts in R&D and thus may be as likely as any manufacturing firm to underinvest in R&D relative to its overall social benefits.

In the view of critics, the appropriate policy response to the positive externalities associated with R&D investment is to offer a subsidy intended to boost such investment that is available to companies in all lines of business. Current federal policy does this by funding research that most companies are loath or unwilling to undertake on their own (mainly basic research) and by providing tax subsidies for private-sector spending on qualified research.

Some have argued that manufacturing is particularly vulnerable to a market failure associated with industry clustering. This clustering occurs when a number of businesses from the same industry set up shop in the same location. There is evidence that clusters of manufacturing firms can be more productive and innovative than similar firms operating in isolation from one another. As a result, when a company builds a plant in an area where a clustering exists, some of the returns on that investment may accrue to other firms in the cluster. Leakages like this are identical in effect to the positive externalities from R&D investments. Without a government subsidy, companies would invest too little in joining clusters, relative to their economic benefits. But critics say that the studies that have been done on the economic benefits of clustering have yet to find evidence of such effects on a large scale.[32] They also point out that the external benefits from

[30] For more on market failures, see Joseph E. Stiglitz, *Economics of the Public Sector*, 3rd ed. (New York: WW. Norton & Company, 2000), pp. 76-90.

[31] This inability relates to the gap between the social and private returns to R&D investments. Research aimed at measuring the returns on such investments indicates that the rate of return on such investments to the companies making the investments is ¼ to ½ of the social rate of return, on average. This difference represents returns that benefit consumers and companies other than the ones investing in R&D. It also denotes the extent of underinvestment in R&D by the private sector. For more details, see Charles I. Jones and John C. Williams, *Measuring the Social Return to R&D*, February 1997, available at http://www.federalreserve.gov/pubs/feds/1997/199712/199712pap.pdf.

[32] Christina D. Romer, "Do Manufacturers Need Special Treatment," *The New York Times*, February 4, 2012.

clustering should arise in not only in manufacturing but in any industry where clustering occurs on a significant scale, such as software, insurance, and entertainment.

Critics also cite "learning by doing" as another example of an alleged market failure in manufacturing that has little or no merit. They note there is no evidence that the process, which encompasses the time, analysis, and adjustments required to make a new production process work efficiently, prevents companies developing new production methods from capturing the returns from those investments. If this were not the case, then one could argue that government assistance would be needed to ensure that firms invest in process innovations in optimal or near-optimal amounts. But such is not the case, say critics. To substantiate this point, they cite a recent study of the U.S. semiconductor industry that found that, while learning by doing represented a substantial share of the cost of investing in new production methods, most of the rewards went to the companies making the initial investments.[33]

Not even the external benefits associated with national defense spending justify targeted government assistance for manufacturers, in the view of critics. They contend that not all manufacturing firms are equally affected by a war effort. Moreover, according to critics, there is no reason to believe that the existing U.S. production base for defense goods, supplemented by military supply arrangements with allies, would be incapable of providing adequate supplies of weapons and other needed materials during a war.[34]

Shrinking Source of Job Creation

A second argument against special assistance for manufacturing concerns job creation. Some critics say it would be misguided in light of recent history for the federal government to target assistance at manufacturing in the expectation that doing so would be likely to spark large employment gains over time. Domestic employment in the sector has been gradually shrinking (with a few temporary upturns) since 1979 and now accounts for almost 9% of U.S. non-farm employment.[35] In the view of critics, many of the factory jobs that were lost over the past three decades are not coming back. They cite several reasons why a return of such jobs on a massive scale is unlikely. First, many of the jobs involved skills that were readily available in places like China and Mexico. Second, even if every U.S. multinational company were to stop outsourcing production and no imports of manufactured products were allowed in the United States, domestic manufacturing employment would probably continue to fall relative to other sectors. This is because Americans have been spending less of their disposable income on goods and more on services since the late 1970s, a trend that is unlikely to change anytime soon. Service industries now account for 44% of U.S. non-farm payroll jobs. Critics also note that the main cause of the mostly sluggish U.S. job growth since the end of the Great Recession in June 2009 has been a slow recovery in aggregate demand here and in other major countries. Thus, in their view, increasing assistance to manufacturing firms, especially SMFs, would do little to boost job creation in the short run, since the assistance would have virtually no effect on the overall demand for goods and services made in the United States.

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[33] Ibid.

[34] Ibid.

[35] In April 2015, according to payroll employment figures released by the U.S. Bureau of Labor Statistics, manufacturing firms accounted for 8.7% of U.S. non-agricultural employment. See http://www.bls.gov/web/empsit/ceseeb1a.htm.

Promoting Service Exports Would Do More to Stimulate the Economy

Critics also say the U.S. economy would benefit more in the short run from government efforts to dismantle foreign barriers to U.S. exports of services than from new programs to bolster the competitiveness of U.S. manufacturers, especially SMFs. They say the United States has a larger comparative advantage in highly skilled services such as engineering, law, finance, and architecture than it does in products made with the use of low-skilled workers (e.g., apparel, wood products, processed foods). In addition, critics note that although the United States is the leading exporter of services in the world,[36] there is considerable untapped potential for expanding U.S. service exports. Current exports come from a small percentage of U.S. companies, and there has been an upsurge in infrastructure development in faster-growing economies like China, India, and Brazil in the past decade. According to an estimate by economist J. Bradford Jensen, the United States could more than double its service exports if existing foreign barriers were removed, creating an additional $800 billion in tradable business services like law and engineering.[37] Such an increase would support or create nearly three million U.S. jobs, according to Jensen, and those jobs would be likely to pay higher wages than manufacturing jobs, on average. In light of such possible gains, critics argue that the federal government should focus more on pressing other governments to open up their service markets to U.S. companies than on promoting exports by domestic manufacturers with no foreign subsidiaries.

Implications of the Arguments for Federal Policy toward Manufacturing

The debate over whether manufacturing industries should receive federal assistance raises several issues that Congress may wish to take into consideration as it examines options for reforming the federal income tax or laying a foundation for future robust economic growth. Each issue has implications for federal policy toward manufacturing.

The evidence cited by both sides in the debate to support their arguments suggests there is no clear economic rationale for providing federal support for the manufacturing sector as a whole. Goods production as an economic activity seems free of any obvious market failures. Some proponents point to manufacturing's major contributions to technological innovation and the positive external benefits associated with R&D investment as evidence that the sector is subject to a market failure. But such an argument is difficult to reconcile with the fact that the positive externalities associated with R&D are not limited to manufacturing but extend, at least in theory, to all companies that invest in R&D. Federal tax policy has recognized this economic reality for nearly 60 years. In 1954, Congress passed a sweeping revision of the federal tax code that included a permanent expensing allowance for qualified research expenditures. In 1981, Congress added a temporary research tax credit to the tax code. Both provisions remain in effect, though the credit has been modified significantly several times and extended 16 times. Since eligibility for these tax subsidies depends critically on the nature of the research a firm finances and the nature of its research expenditures, and not on the industry in which a firm is classified, the

[36] According to the latest figures on commercial service exports from the International Monetary Fund, U.S. exports of services in 2013 totaled $662.9 billion, or 14% of the worldwide amount. The second largest exporter of services was Germany, which accounted for 7% of world exports..

[37] Catherine Rampell, "Some Urge U.S. to Focus on Selling Its Skills Overseas," *The New York Times*, April 10, 2012.

subsidies have the potential to stimulate increased investment in innovative activity across all sectors, not just in manufacturing.

The debate also suggests that increased federal aid for manufacturing on the whole would be unlikely to spark a significant rise in the domestic rate of job creation. The sector's contribution to overall employment has been declining for more than three decades and now stands at just under 9% of U.S. non-farm employment. In an economy marked by uneven and relatively weak job growth more than six years after the end of the 2007-09 recession, it can be argued that increased federal assistance for manufacturing would do less to spur faster job growth in the short run than policy measures that deliver a greater stimulus to aggregate demand, such as increased federal spending on the rebuilding and expansion of the U.S. transportation network.

Another issue raised by the arguments for and against targeted federal support for manufacturing concerns the importance for the domestic climate for technological innovation of the undertaking of production and R&D in the same location. Proponents of a greater federal role in revitalizing the domestic manufacturing base say that the future growth potential of the U.S. economy hinges in part on finding ways to convince more manufacturing firms to perform a substantial share of their R&D and production in the United States. A critical consideration here is the impact on the competitiveness of companies that invest heavily in R&D of separating innovation activities and production in different countries (or perhaps in different companies). Proponents contend that such a separation makes it harder for a company to take full advantage of the commercial benefits from implementing new technologies. But the evidence is not conclusive either way. Thus, Congress may want to look into the extent to which the economic returns from innovation depend on domestic production capabilities tied to the domestic development of new products and processes.

The debate also leaves the distinct impression that policy initiatives to bolster the international competitiveness of U.S. manufacturers would have similar benefits for other sectors, and thus should not be limited to manufacturing. Some proponents of a greater federal assistance for manufacturing say federal policy should focus on four objectives: increased R&D support, greater investment in worker training, improved access to investment capital, and the creation of new collaborative mechanisms for creating and sharing productivity improvements and other innovations among smaller firms. Yet there is no obvious reason why most firms in other industries would not benefit from them as well. Rather than focusing on manufacturing as the primary pathway to growing the U.S. economy, Congress might consider policy options for providing more R&D support, improving worker training to reduce mismatches between employer skill needs and the skill sets of workers, expanding access to credit for small- and medium-sized companies, and encouraging the growth of industry-specific networks that could offer a range of collaborative services for the mutual benefit of individual firms that would apply to all industries.

Finally, though this issue is not the primary focus of the arguments addressed here, Congress may wish to examine the advantages and disadvantages of using tax incentives as a primary tool for achieving any policy objectives it may establish for manufacturing industries. Permanent tax incentives require no annual appropriations or other congressional action to have their intended effect. They operate like hidden entitlements that can produce sizable revenue losses, impose significant compliance burdens on companies, and generate additional enforcement costs for the IRS. By contrast, policy initiatives based on spending can be more transparent and amenable to congressional oversight. The comparative advantages of spending programs (including credit guarantees) and of tax incentives aimed at a specific industry like manufacturing might receive

greater scrutiny as Congress considers options for tax reform in the coming months. Some options would seek to achieve revenue neutrality by lowering business income tax rates and expanding the business tax base by reducing or repealing certain business tax incentives.

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