

**IN THE UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT**

LITTLE SANDY COAL COMPANY, INC.,

Petitioner-Appellant,

v.

COMMISSIONER OF INTERNAL REVENUE,

Respondent-Appellee.

Appeal from the United States Tax Court,
Case No. 17431-17
Honorable Judge James S. Halpern

**BRIEF OF *AMICUS CURIAE* THE NATIONAL ASSOCIATION OF
MANUFACTURERS IN SUPPORT OF
APPELLANT**

Joseph R. Guerra
Counsel of Record
Matthew D. Lerner
SIDLEY AUSTIN LLP
1501 K Street, NW
Washington, DC 20005
(202) 736-8000
jguerra@sidley.com

Counsel for The National Association of Manufacturers

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Attorney's Signature: /s/ Joseph R. Guerra Date: March 31, 2022

Attorney's Printed Name: Joseph R. Guerra Counsel of Record: Yes

Address: Sidley Austin LLP, 1501 K Street N.W., Washington, DC 20005

Phone Number: (202) 736-8000

Fax Number: (202) 736-8711

Email Address: jguerra@sidley.com

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N/A

Attorney's Signature: /s/ Matthew D. Lerner

Date: March 31, 2022

Attorney's Printed Name: Matthew D. Lerner

Counsel of Record: No

Address: Sidley Austin LLP, 1501 K Street N.W., Washington, DC 20005

Phone Number: (202) 736-8000

Fax Number: (202) 736-8711

Email Address: mlerner@sidley.com

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INTEREST OF *AMICUS CURIAE*

The National Association of Manufacturers (NAM) submits this brief in support of appellant Little Sandy Coal Company, Inc.¹ The NAM is the largest manufacturing association in the United States, representing small and large manufacturers in every industrial sector in all 50 states. Manufacturing employs more than 12.5 million men and women, contributes \$2.57 trillion to the U.S. economy annually, and has the largest economic impact of any major sector. The NAM is the voice of the manufacturing community and the leading advocate for policies that help manufacturers compete in the global economy and create jobs across the United States.

This appeal involves an issue of particular significance for manufacturers—*i.e.*, the proper method of determining what constitutes “qualified research” for purposes of the tax credit for qualified research

¹ Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(E), *amicus* states that no counsel for a party authored this brief in whole or in part, and no party or counsel for a party contributed money intended to fund the preparation or submission of this brief. No person, other than *amicus*, its members, or their counsel contributed money intended to fund the preparation or submission of this brief. The parties have consented to the filing of this brief.

expenses under § 41 of Internal Revenue Code (Code).² Manufacturing accounts for nearly 58% of all private-sector research and development (R&D) in the United States, driving more innovation than any other sector. R&D in the manufacturing sector has risen from \$132.5 billion in 2000 to \$295.7 billion in 2020.³ The tax credit for qualified research expenses in § 41 is an important inducement to these investments, which in turn generate domestic jobs and help the United States maintain and enhance its technological advantages in the increasingly competitive global economy. In the decision below, however, the Tax Court misinterpreted § 41 in a way that improperly limits the availability of this important credit.

The “qualified research expenses” that can be used to calculate the credit include the costs of “qualified services,” which are the work of employees engaged in either “qualified research” or “the direct supervision or direct support of research activities which constitute qualified research.” Research activities constitute “qualified research” if

² The Code is codified in 26 U.S.C. For simplicity, *amicus* cites the relevant provisions as “I.R.C. §.”

³ See <https://www.nam.org/facts-about-manufacturing/> (last visited Mar. 28, 2022).

80% of those activities (measured on the basis of costs or some other reasonable standard) are part of a process of experimentation relating to a new or improved function of a product, or to the performance, reliability, or quality of a product (the “80% test”). And a “process of experimentation” consists of evaluating alternatives and eliminating uncertainty. Thus, when an R&D project seeks to create or improve a product or process, the 80% fraction is calculated as:

(i) research activities devoted to evaluating alternatives and eliminating uncertainty for the product or improvement over

(ii) all research activities for that new or improved product

The taxpayer in this case indisputably engaged in a process of experimentation to design and develop a new tanker and dry-dock. It argued, moreover, that construction of these items was necessary to test those designs. In applying the 80% test, however, the Tax Court concluded that, if these items were built for testing purposes, their construction was a research activity for purposes of the denominator, but *was not* a research activity for purposes of the numerator. Because of the substantial wages paid to employees who built the tanker and dry-dock, that conclusion made it impossible for the taxpayer to meet

the 80% requirement, thereby rendering all of its research expenditures on the project ineligible for the tax credit.

As *amicus* explains, the Tax Court’s approach to the 80% test is inconsistent with the text, structure, history, and purpose of § 41, and with the implementing regulations. Fabrication of prototypes or pilot models used in testing can be essential to the development of new products, particularly in the manufacturing sector. And, as was true in this case, the labor costs for such fabrication can be substantial. The Tax Court’s reasoning inexplicably penalizes manufacturers who, in performing legitimate and potentially important R&D, incur substantial construction costs to test new designs or concepts. If affirmed, that reasoning will undermine Congress’ efforts to encourage increased investments in domestic R&D, including increased spending on employees who directly support R&D efforts—results completely at odds with the purpose of the law.

BACKGROUND

At the outset, it is helpful to understand the historical context of the statutory and regulatory language underlying the “qualified research” issue in this case.

1. Development of the Section 41 R&D Credit.

Congress has long used the tax code to encourage domestic R&D. Since 1954, the Code has allowed taxpayers to deduct “research or experimental expenditures’ ... which are paid or incurred by [them] during such taxable year in connection with [their] trade or business.” *See* I.R.C. § 174(b). This deduction is more favorable than requiring that such expenditures be treated as investments in capital, which must be depreciated over a longer period of time. Although Congress did not define the term “research or experimental expenditures,” Treasury regulations have long done so. Today, the relevant regulation explains that the term refers to costs in the “experimental or laboratory sense,” which generally includes “all such costs incident to the development or improvement of a product” that are “intended to discover information that would eliminate uncertainty concerning” that development or improvement. 26 C.F.R. § 174-2(a)(1).

In 1981, Congress added a credit (now codified in I.R.C. § 41) for “increasing research activities.” Pub. L. No. 97-34, tit. II, § 221(a), 95 Stat. 241, 241 (1981) (hereafter “1981 Act”), § 44F. Enactment of the credit was prompted by concerns that other nations were “rapidly

encroaching on what was once a dominant American position” in R&D; that R&D was “essential to improving productivity”; and that a tax incentive was needed “to encourage this activity.” S. Rep. No. 96-940, at 13 (1980). Noting that “the decline in this country’s research and development activities has adversely affected economic growth, productivity gains, and our competitiveness in world markets,” the House Report stated “that a substantial tax credit for incremental research and experimental expenditures will overcome the resistance of many businesses to bear the significant costs of staffing, supplies, and certain computer charges which must be incurred in initiating or expanding research programs.” H.R. Rep. No. 97-201, at 111 (1981). *See also* S. Rep. No. 96-940, at 93 (1981) (“The committee believes that a substantial tax credit for incremental research and experimental expenditures will overcome the resistance of many businesses to bear the costs of staff and facilities which must be incurred in initiating or expanding research programs”). Congress understood, moreover, that staffing costs were a particularly significant component of R&D spending. *See Tax Reduction Proposals: Hearings before the S. Fin. Comm.*, 97th Cong. 5 (1981) (statement of Rep. James Shannon) (noting

that “[e]quipment purchases constitute only a small portion of the total [R&D] expenses of industry. The predominant expenditures are for *salaries* and overhead”) (emphasis added).

These staffing costs extend well beyond the wages paid to engineers and scientists who conduct research. In the manufacturing sector, for example, developing new or improved technologies can entail substantial expenditures for workers who build the prototypes or models that must be tested to determine if a new design works.

The 1981 legislation reflected a clear appreciation of these realities. It provided a credit for “qualified research expenditures,” defined as “in-house research expenses” and “contract research expenses” paid or incurred during the taxable year. 1981 Act, § 44F(b)(1). “In-house research expenses” included “(i) any wages paid or incurred to an employee for qualified services performed by such employee, (ii) any amount paid or incurred for supplies used in the conduct of qualified research, and (iii) any amount paid or incurred to another person for the right to use personal property in the conduct of qualified research.” *Id.*, § 44F(b)(2)(A). “Qualified services,” in turn, meant “(i) engaging in qualified research, or (ii) engaging in the direct

supervision or direct support of research activities which constitute qualified research.” *Id.*, § 44F(b)(2)(B).

The legislative history provided examples of each of the foregoing categories of “qualified services.” The first, “engaging in qualified research,” meant those employees involved in the “actual conduct of research (as in the case of a laboratory scientist)”; the second, “direct supervision,” meant the “immediate supervision of persons actually conducting research (as in the case of a research scientist who supervises other laboratory scientists...)”; and the third, “direct support,” included, “for example, the services of ... a secretary in typing reports describing the laboratory research results, or a laboratory worker in cleaning research equipment, or of a machinist in machining a part of an experimental model.” H.R. Rep. No. 97-201, at 117.⁴

To induce increased spending on these and other R&D-related costs, the statute provided a credit, calculated as a percentage of the increase of qualified research expenditures over a “base amount,” which was generally the average amount of the taxpayer’s yearly qualified

⁴ Each of the foregoing examples is now codified in implementing regulations. *See* 26 C.F.R. § 1.41-2(c)(1)-(3).

research expenditures in the preceding three taxable years. *See id.* at 121-22.

Nothing in the 1981 Act reflected a congressional concern with the *ratio* of spending on wages for employees who engage in qualified research, versus spending on wages for employees who directly supervise or directly support such research. While the definition of “qualified services” distinguished these categories, all three counted towards the credit, and the definition of “qualified research” drew no distinctions between the tax treatment of the three. It simply provided that the term “qualified research” had “the same meaning as the term research or experimental has under section 174,” except that it excluded research (1) conducted outside the United States, (2) conducted in the social sciences or humanities, or (3) funded by any grant, contract, or otherwise by another person (or any governmental entity). 1981 Act, § 44F(d).

2. Amendment of the Definition of “Qualified Research”

Not long after the credit was enacted, Congress grew concerned that it was being claimed “too broadly” by taxpayers that were in “industries that do not involve high technology or its application in

developing technologically new and improved products or methods of production.” H.R. Rep. No. 99-426, at 178 (1985). The credit was being claimed, for example, by “fast food restaurants, fashion designers and hair stylists.” 66 Fed. Reg. 66,362, 66,363 (Dec. 26, 2001). *See also Research & Experimentation Tax Credit: Hearings Before the Subcomm. on Oversight of the Comm. On Ways & Means, H. of Reps.*, 98th Cong. 2 (1984) (statement of Rep. Charles Rangel). Similarly, it was being claimed for financial products, such as variable annuities, or legal forms and advertising, all of which were based on information that “does not qualify as technological in nature.” H.R. Rep. No. 99-841, at 71-72 (1986). *See also* 66 Fed. Reg. at 66,363.

In 1986, Congress responded to perceived overuse of the credit by narrowing the definition of “qualified research.” Expenditures on qualified research still had to satisfy the requirements of § 174. *See* Pub. L. No. 99-514, 100 Stat. 2173, § 231(d)(1)(A) (1986) (codified at I.R.C. § 41(d)(1)(A)). But the definition of “qualified research” was narrowed to mean “research”

[(d)(1)](B) which is undertaken for the purpose of discovering information—

(i) which is technological in nature, and

(ii) the application of which is intended to be useful in the development of a new or improved business component of the taxpayer, and

[(d)(1)](C) substantially all of the activities of which constitute elements of a process of experimentation for a purpose described in paragraph (3).

Id., 100 Stat. at 2173-74, § 231(d)(1)(B)-(C) (codified at I.R.C.

§ 41(d)(1)(B)-(C)). The permissible “purpose[s]” for experimentation

“described in paragraph (3)” included “a new or improved function, performance, or reliability or quality,” but did not include “style, taste, cosmetic, or seasonal design factors.” *Id.*, 100 Stat. at 2174,

§ 231(d)(3)(A)&(B) (codified at I.R.C. § 41(d)(3)(A)&(B)). These new “purpose” requirements applied to each “business component,” which includes any product that the taxpayer sells or uses in its business. *Id.*, 100 Stat. at 2174, § 231(d)(2)(A)&(B) (codified at I.R.C.

§ 41(d)(2)(A)&(B)).⁵

⁵ Congress also expanded the list of excluded research activities, which encompass, *inter alia*, research after commercial production of a business component; research related to duplication of an existing business component or its adaptation to a particular customer’s needs or specification; various surveys or studies, such as efficiency surveys and market research; and routine testing or inspection for quality control. Pub. L. No. 99-514, 100 Stat. at 2174, § 231(d)(4) (codified at I.R.C. § 41(d)(4)).

Notably, while Congress significantly overhauled the definition of “qualified research,” it made no changes to the definition of the “qualified services” that count as “qualified research expenditures.” Thus, Congress addressed concerns about overuse of the § 41 credit by narrowing the nature and purpose of the underlying research that could give rise to a credit—not by altering the nature of expenditures used to calculate the credit.

Moreover, the amendments to the definition of “qualified research” evinced no concern that taxpayers that were engaged in research for proper purposes were nevertheless spending too much on employees directly supervising or supporting that research relative to the amount they spent on employees conducting it. The only explicit reference to “expenditures” in the amended definition required that they satisfy § 174, which, as noted, generally includes all costs in the “experimental or laboratory sense” that are “incident to the development or improvement of a product.” 26 C.F.R. § 1.174-2(a)(1).

3. The Implementing Regulations

The regulations implementing the amended definition of qualified research reflect the same focus on the “purpose” of the research itself—

and the same lack of concern with the portion of wages spent on direct supervision and direct support of those engaging in qualified research. With respect to subsection (d)(1)(B)'s "discovering information" requirement, Treasury concluded that Congress meant "to distinguish technological research, which may qualify for the research credit, from non-technological research, which does not." 66 Fed. Reg. at 66,363. Similarly, for subsection (d)(1)(C), Treasury determined that a process of experimentation "is a process designed to evaluate one or more alternatives to achieve a result where the capability or the method of achieving that result, or the appropriate design of that result, is uncertain as of the beginning of the taxpayer's research activities." *Id.* at 66,364. *See also* 26 C.F.R. § 1.41-4(a)(5)(i) (codifying this principle).

In explaining these requirements, Treasury did not refer to any congressional concern that taxpayers were spending relatively too little on wages for scientists and engineers who conduct research, as compared to the wages for employees who provide direct support and direct supervision. Nor did Treasury mention any such concern when it implemented subsection (d)(1)(C)'s "substantially all" test. This requirement, Treasury concluded, requires a showing that "80 percent

or more of the research activities, measured on a cost or other consistently applied reasonable basis . . . , constitute elements of a process of experimentation.” 69 Fed. Reg. 22, 24 (Jan. 2, 2004). In propounding this fraction, Treasury did not refer to direct support or direct supervisory activities, much less specify that they are to be included in the denominator but not the numerator when calculating the 80% fraction. Rather, Treasury made clear that the relevant ratio is (1) the amount of research activities devoted to evaluating alternatives and eliminating uncertainties for creating or improving a product or its quality or reliability, relative to (2) the total amount of research activities devoted to that new or improved product.

Thus, for example, Treasury described an automaker, X, that “designs, models, simulates, tests, refines, and re-tests several alternative designs for the hood and associated proposed modifications to both the air intake system and cooling system” of a vehicle. 69 Fed. Reg. at 27. X satisfied the 80% test, Treasury explained, because the foregoing activities constituted “eighty-five percent of X’s total activities to update its current model vehicle,” and enabled “X to eliminate the uncertainties related to the integrated design of the hood, air intake

system, and cooling system,” while the remaining 15 percent of the activities did “not involve a process of evaluating alternatives in order to eliminate uncertainties.” *Id.*⁶ Nowhere in this example (or in any other illustration of how the 80% test works) did Treasury describe any of the activities as “direct support” or “direct supervision,” much less state that these qualified services are part of the “remaining activities” that can cause a taxpayer to flunk the 80% test.

4. The Tax Court’s Decision

In the decision below, the Tax Court recognized that appellant’s efforts to design the Apex tanker involved “a process of experimentation” for a proper purpose under § 41(d)(1)(C) and (d)(3)(A). Op. 24.⁷ It further recognized that, if the efficacy of the proposed design of the tanker could be determined only by testing the physical component, the work of the employees who fabricated that component directly supported the research involved in improving the component. *Id.* at 31. The Tax Court ruled, however, that, in determining compliance with the 80% test, direct support activities to build such a

⁶ This example is now codified at 26 C.F.R. § 1.41-4(a), Example 4.

⁷ Cites to the decision below are based on the pagination in Appellant’s Short Appendix.

prototype had to be excluded from the numerator, but included in the denominator.

With respect to the numerator, the court reasoned that “qualified research” does “not encompass the fashioning of the component. The distinction that section 41(b)(2)(B) draws between ‘engaging in qualified research’ and ‘engaging in the ... direct support of research activities which constitute qualified research’ allows no other conclusion.” *Id.* at 32. As for the denominator, however, the court concluded that, if the tanker component was built as a pilot model for testing, then the construction costs were research activities for purposes of the denominator. *See id.* at 37-38 (reasoning that, if the tanker is a pilot model, the “consequence” is that the activities of the production employees are included in the denominator).

This treatment of direct support activities made it impossible for the taxpayer to satisfy the “substantially all” test, and thus rendered all of the costs it incurred designing the new tanker and dry-dock ineligible for the research credit. The Tax Court’s reasoning will likewise preclude other manufacturers from qualifying for the credit when their R&D efforts require them to pay substantial wages to employees who

construct prototypes necessary to evaluate and eliminate uncertainties in technological improvements. As *amicus* explains below, the Tax Court’s reasoning is plainly wrong and its decision should be reversed.

SUMMARY OF ARGUMENT

The “substantially all” test for determining whether research is “qualified research” under § 41(d) is based on the ratio of (1) *research activities* devoted to a process of experimentation for a new or improved product or process over (2) all *research activities* devoted to that new or improved product or process. Direct support and supervision are not “research activities” under § 41. Section 41(b)(2)(b) draws a clear distinction between two types of “qualified *services*”—one involves “engaging in qualified *research*,” and the other involves “engaging in direct supervision or direct support *of research activities* which constitute qualified research.” I.R.C. § 41(b)(2)(B)(i)-(ii) (emphases added). Thus, direct support and supervision are *service* activities that facilitate *research* activities; they are not themselves research activities. That conclusion is bolstered by the examples of “qualified services” set forth in the legislative history.

When Congress adopted § 41 in 1981, it clearly sought to encourage spending on qualified services, including spending on direct support and supervision. The 1986 amendments reflect no change of heart concerning that goal. Instead, Congress narrowed the definition of “qualified research” to restrict the credit to entities (like manufacturers) that engage in technological advancement. Significantly, Congress did not alter the definition of “qualified services,” nor did it require that “substantially all” of the research activities *and other “qualified services”* constitute a process of experimentation.

Treating direct support and supervision as research activities that are included in the denominator (but not the numerator) of the 80% test is an incoherent interpretation of § 41 that undermines its very purpose. Constructing prototypes to test new concepts or designs can be critical to R&D efforts in the manufacturing sector, and can likewise entail significant labor costs. Congress clearly intended to encourage these expenditures. Yet, including those costs in the denominator but not the numerator of the 80% test has the perverse effect of causing taxpayers engaged in legitimate R&D efforts to flunk the 80% test, and thus not to qualify for the credit at all.

Because the text, structure, history, and purpose of § 41 all make clear that direct support and supervision are not research activities for purposes of the “substantially all” test, there is no need to consider Treasury’s implementing regulations. Those regulations, however, are entirely consistent with the conclusion that direct support and supervision are not research activities, and that those activities should not be included in either the denominator or numerator of the 80% test.

Finally, if the relevant provisions were otherwise ambiguous (and they are not), the only reasonable alternative interpretation would be to include direct support and direct supervision activities in both the numerator and denominator. If the construction of a prototype is a “research activity,” then it is also an “*element*” of a process of experimentation.” I.R.C. § 41(d)(1)(C) (emphasis added). Indeed, Treasury regulations squarely recognize that a prototype, or “pilot model,” is “*produced to evaluate and resolve uncertainty* concerning the product during the development or improvement of the product.” 26 C.F.R. § 1.174-2(a)(4) (emphasis added). Producing a prototype, therefore, is an element, or constituent part, of a process of

experimentation, which is the process of evaluating alternatives and eliminating uncertainties.

ARGUMENT

I. DIRECT SUPERVISION AND DIRECT SUPPORT ARE NOT RESEARCH ACTIVITIES FOR PURPOSES OF THE 80% TEST, AND SHOULD BE EXCLUDED FROM THE “SUBSTANTIALLY ALL” CALCULATION.

The interpretation of a statute “begins with the plain language.” *City of Chicago v. Barr*, 961 F.3d 882, 898 (7th Cir. 2020). Statutory language, however, is “interpreted not in a vacuum, but in light of the context and the statutory structure as a whole. Proper interpretation considers not only the specific context in which the language is used, but the overall structure of the statute as a whole, as well as its history and purpose.” *Id.* (citation omitted). Here, all of the foregoing tools of interpretation demonstrate that direct support and direct supervision activities are properly excluded from *both* the numerator and denominator of the 80% fraction.

A. The Plain Language Of Section 41(b)(2)(B) Demonstrates That Direct Supervision And Direct Support Are Not Research Activities.

Section § 41(d)(1) defines “qualified research” as “research” that satisfies the requirements set forth in subsections (d)(1)(A) through

(d)(1)(C). The third of these requirements is that “substantially all of the *activities of which* [*i.e.*, substantially all of the *research* activities] constitute elements of a process of experimentation for a purpose described in paragraph (3).” I.R.C. § 41(d)(1)(C) (emphasis added). As noted, the Tax Court believed that the “qualified services” of direct support and direct supervision are excluded from the 80% fraction’s numerator, but are included in its denominator if they relate to fabrication of a pilot model. The flaw in this reasoning is the Tax Court’s assumption that direct support and direct supervision are “research activities.” They are not.

Ironically, while the Tax Court focused on the language of subsection 41(b)(2)(B) in determining that direct support and direct supervision should be excluded from the 80% numerator, it overlooked this same language when deciding that these activities could be included in the denominator. Subsection 41(b)(2)(B) identifies the qualified services of “engaging *in qualified research*,” and “engaging in the direct supervision or direct support *of research activities* which constitute qualified research,” *id.* § 41(b)(2)(B)(i)&(ii) (emphases added). The contrasting language in these two subclauses, and in particular the

use of the phrase “*of research activities*” in subclause (ii), demonstrate that direct supervision and direct support are not themselves “research activities.” Rather, they are activities that enable research activities.

Indeed, if Congress had thought that direct supervision and direct support were simply additional *types* of research activities, it would have provided a definition of qualified *research* services,” instead of the broader term “qualified services.” Because Congress used the word “research” in several other defined terms in § 41,⁸ the omission of that word from the defined term “qualified services” shows that the latter encompasses more than research activities. *Russello v. United States*, 464 U.S. 16, 23 (1983) (“[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion”) (alteration in original). The careful wording Congress used in both its choice of defined terms throughout § 41, and in § 41(b)(2)(B)(ii) itself,

⁸ See I.R.C. § 41(b)(1) (defining “Qualified research expenses”); *id.* § 41(b)(2)(A) (defining “in-house research expenses”); *id.* § 41(b)(3)(A) (defining “Contract research expenses”); *id.* § 41(d)(1) (defining “Qualified research”).

demonstrates that direct supervision and direct support are “qualified services” that *facilitate*—but do not themselves *constitute*—research activities.

This is confirmed by the examples of “qualified services” set forth in the legislative history. The secretary who “typ[es] reports describing the laboratory research results,” the machinist who “machin[es] a part of an experimental model,” and the worker who “clean[s] research equipment,” H.R. Rep. No. 97-201, at 117, are not engaging in research; they are engaged in clerical, construction, and maintenance or technician activities that directly support others who engage in research activities.

Thus, because direct support and direct supervision are not “research activities,” they should not be considered at all in determining whether 80% of all research activities constitute a process of experimentation.

B. The Structure And History Of Section 41 Demonstrate That Direct Supervision And Direct Support Are Not Research Activities.

The overall structure and history of § 41 bolster this conclusion. Congress adopted a broad definition of “qualified services” that swept

beyond “research activities” based on its view that a substantial tax credit was needed to “overcome the resistance of many businesses to bear the costs of *staff* and facilities which must be incurred in initiating or expanding research programs.” S. Rep. No. 96-940, at 93 (emphasis added). Indeed, evidence before Congress showed that the “predominant [R&D] expenditures are for *salaries* and overhead.” *Tax Reduction Proposals: Hearings before the S. Fin. Comm., supra*, 97th Cong. 5 (emphasis added) (statement of Rep. James Shannon). And the legislative history discussed above reflects Congress’ understanding that R&D staff included more than just the scientists and engineers who design and conduct research. *See supra* at 8.

The amendments Congress made to § 41 five years later do not reflect concerns that taxpayers were spending too much on direct support and supervisory staff relative to spending on research staff. Instead, Congress was concerned that the credit was being claimed by entities that were not in the technology field at all, or that were devoting too much of their research activities to non-technological improvements and advancement. *Supra* at 9-10. Accordingly, Congress did not amend the definition of qualified services. Instead, it narrowed

the definition of “qualified research” so that taxpayers could continue to seek a credit based on wages paid for direct supervision and direct support, but only if those services were performed for research that met the narrower “purposes” set forth in the amended definition of “qualified research.”

Moreover, when Congress narrowed the definition of “qualified research,” it clearly understood that “qualified services” included more than research activities. Yet, the “substantially all” test focuses on the extent to which *research activities* are devoted to a process of experimentation. See I.R.C. § 41(d)(1)(C) (referring to “*research ... substantially all of the activities of which* constitute elements of a process of experimentation for a purpose described in paragraph (3)” (emphases added)).⁹ Congress did not, by contrast, require a showing that “substantially all” of the research activities and *other qualified services* constitute a process of experimentation. Once again, therefore, Congress’ choice of words demonstrates that it did not intend to preclude use of the § 41 credit simply because taxpayers devote

⁹ See also 26 C.F.R. § 1.41-4(a)(6) (substantially all requirement is satisfied “only if 80 percent or more of a taxpayer’s *research activities ...* constitute elements of a process of experimentation”) (emphasis added).

significant portions of their R&D budgets to direct support activities like the construction of pilot models used in qualified research.

Indeed, in 1985, the then-extant regulations implementing § 174 provided that “research and development costs” in the “experimental or laboratory sense” generally included “*all such costs incident to the development of [inter alia] an experimental or pilot model.*” 26 C.F.R. § 1.174-2(a)(1) (1985) (emphases added).¹⁰ In light of “the well-settled presumption that Congress understands the state of existing law when it legislates,” *Bowen v. Massachusetts*, 487 U.S. 880, 896 (1988), if Congress had meant to change the law and preclude use of the § 41 credit whenever the labor costs of constructing a pilot model for a product exceeded 20% of the total amount of R&D costs, it had to express that intent clearly. Yet, the language of the amended definition failed to do so. To the contrary, Congress continued to require that expenditures comply with § 174, *see* I.R.C. § 41(d)(1)(A), and the

¹⁰ There was an exception when research resulted “in depreciable property to be used in the taxpayer’s trade or business”; in that circumstance, “the actual costs of material, labor, etc., to construct” that property were not deductible and had to be amortized. 26 C.F.R. § 1.174-2(b)(2)&(4) (1985). Treasury later rescinded that exception. *See* TD 9680, 79 Fed. Reg. 42,193 (July 21, 2014).

“substantially all” ratio it added is based solely on research activities, not research activities as well as the *other* “qualified services” of direct support and direct supervision.

C. Treating Direct Supervision and Direct Support As Research Activities Is Inconsistent With—And Undermines—The Purposes Of The Credit.

As the facts of this case vividly illustrate, treating direct supervision and direct support as research activities for purposes of the denominator, but not the numerator, of the 80% fraction is inconsistent with the purpose of the § 41 credit, and in fact frustrates that purpose. The taxpayer here engaged in precisely the kind of technological research Congress sought to foster under the amended definition of “qualified research”: its “efforts to design the tanker and dry dock involved activities that ‘constitute[d] elements of a process of experimentation’ for a purpose related to ‘a new or improved function,’ ‘performance,’ or ‘reliability or quality.’” Op. 24. The Tax Court further acknowledged that, if the efficacy of the design of the tanker component could be determined only through testing after fabrication, the labor involved in building the pilot model constituted direct support. *Id.* at 31. Yet, under the Tax Court’s application of the 80% test, these labor

costs—which were both necessary to effective research and substantial in amount—render the entire R&D effort for these business components ineligible for the § 41 credit. That result is completely at odds with the purposes of the statute.

Both the text and legislative history make clear that Congress enacted the credit to induce companies to spend more money on the supplies and *staff* needed for R&D. *Supra* at 6-8. Congress clearly understood that the necessary staff would include employees other than scientists and engineers, such as “machinist[s]” who “machin[e] a part of an experimental model.” H.R. Rep. No. 97-201, at 117. Under the amended definition of “qualified research,” the amount spent on necessary *supplies* has no bearing on whether the underlying research meets the 80% test. There is no reason that the amount spent on necessary *support staff* should either. It is illogical to treat the latter category of expenditures—which Congress clearly sought to *encourage*—as a basis for concluding that research flunks the 80% test, even when it is undertaken to evaluate technological alternatives and eliminate uncertainties.

If affirmed, the Tax Court’s misapplication of the 80% test will disqualify, and thus ultimately discourage, other R&D efforts. In 2019, one-third of the 1.8 million employees involved in domestic R&D were technicians and “other supporting staff.”¹¹ As that figure indicates, companies engaging in R&D spend substantial amounts on the employees who support the scientists and engineers actually conducting research.

Many manufacturers, moreover, must construct pilot models or prototypes to test new designs. When automakers design new cars, for example, “unique prototypes must be built” and “real-world tests must be done,” including testing in “extreme weather conditions.”¹² The construction of physical prototypes is generally time-consuming and expensive. For cars, it can cost approximately \$250,000 to \$1 million

¹¹ See R. Wolfe, Nat’l Ctr. for Sci. and Eng’g Statistics, *Businesses Reported an 11.8% Increase to Nearly a Half Trillion Dollars for U.S. R&D Performance During 2019*, tbl. 4 (Nov. 18, 2021), <http://nces.nsf.gov/pubs/nsf22303>. The study defined “researchers” to include “R&D scientists and engineers *and their managers*,” *id.*, tbl. 4, n.b (emphasis added).

¹² T. Shea, Autoblog, *Why Does It Cost So Much For Automakers To Develop New Models* (July 27, 2010), <https://www.autoblog.com/2010/07/27/why-does-it-cost-so-much-for-automakers-to-develop-new-models/>.

“per vehicle,” with manufacturers typically building 50 to 70 prototypes “per development program.”¹³ While new technologies make it possible to create “virtual” prototypes and conduct testing through simulations, expensive physical prototypes remain the “gold standard” in many circumstances, particularly for breakthrough innovations, or products characterized by complexity.¹⁴

Yet, under the Tax Court’s misguided application of the 80% test, labor costs associated with the construction of critical pilot models are grounds for *disqualifying* projects from the § 41 credit. That application renders the statute internally inconsistent, if not incoherent. Congress limited “qualified research” to preclude use of the credit by entities such as fast food restaurants, fashion designers, hair stylists, and sellers of non-technological products, such as variable annuities. *Supra* at 10. It intended to encourage use of the credit by manufacturers that, in designing new and improved technological products, must incur

¹³ Auto. Testing Tech. Int’l, *Ditch The Prototypes* (Mar. 26, 2018), <https://www.automotivetestingtechnologyinternational.com/industry-opinion/ditch-the-prototypes.html>.

¹⁴ See J. Liker & R. Pereira, *Virtual and Physical Prototyping Practices: Finding the Right Fidelity Starts With Understanding the Product*, 46 IEEE Eng’g Mgmt. 71, 75, 79-80, 82 (Dec. 2018).

substantial costs for direct support activities, such as the labor costs for constructing physical prototypes. Yet the Tax Court’s application of the 80% test discourages those very activities. That cannot be what Congress intended when it amended the definition of “qualified research.”

D. Treasury Regulations Are Consistent With The Conclusion That Direct Support And Direct Supervision Are Not Research Activities.

Where, as here, the text, structure, history, and purpose of a statute unambiguously resolve the question before the Court, there is no need to consider any further evidence, and likewise no basis for deferring to any contrary view of an agency. *See Vulcan Constr. Materials, L.P. v. Fed. Mine Safety & Health Review Comm’n*, 700 F.3d 297, 309-12 (7th Cir. 2012) (no deference owed agency interpretation where the meaning of a statute was unambiguous after consideration of its language, context in which that language was used, and the broader context of the statute as a whole). In all events, Treasury regulations are consistent with the conclusion that direct support and direct supervision activities are not research activities and are not considered in the “substantially all” calculation.

The regulations implementing § 41(b)(2)(B) define “engaging in qualified research” as “the *actual conduct* of qualified research (as in the case of a scientist conduct laboratory experiments).” 26 C.F.R. § 1.41-2(c)(1) (emphasis added). They then define “direct supervision” as “the immediate supervision (first-line *management*) of qualified research,” and exclude “a higher-level *manager* to whom first-line *managers* report.” *Id.* § 1.41-2(c)(2) (emphases added). “Direct supervision” thus involves *managerial* activities, not research activities.

Similarly, the regulations define “direct support” as “services in the direct support of either (i) Persons engaging in actual conduct of qualified research, or (ii) Persons who are directly supervising persons engaging in the actual conduct of qualified research.” *Id.* § 1.41-2(c)(3). The regulations then provide the same examples of secretarial, maintenance, and construction activities that are set forth in the legislative history. *Id.* These regulations confirm that direct support activities are not research activities for purposes of the “substantially all” test of § 41(d)(1)(C).

The regulations implementing the amended definition of “qualified research” confirm this conclusion. They repeatedly emphasize

that the “substantially all” test is based solely on “research activities.” Thus, they state that the test is met “if 80 percent or more of a taxpayer’s *research activities* ... constitute elements of a process of experimentation for a purpose described in section 41(d)(3),” and that this is true “even if the remaining 20 percent (or less) of a taxpayer’s *research activities* with respect to the business component do not constitute elements of a process of experimentation for a purpose described in section 41(d)(3), so long as these remaining *research activities* satisfy the requirements of section 41(d)(1)(A) and are not otherwise excluded under section 41(d)(4).” *Id.* § 1.41-4(a)(6) (emphases added). Nowhere, however, do these regulations state that direct supervision and direct support activities are research activities.

The examples accompanying this explanation are to the same effect. In the examples where the taxpayer fails the 80% test, it is because the research activities are not for a proper purpose; *see id.* Example 1 (research relating to style, taste, cosmetic, or seasonal design factors); Example 2 (ordinary testing or inspection for quality control); or do not involve a process of evaluating alternatives to eliminate uncertainties, *id.* Examples 5-7, 9. In none does the taxpayer

flunk the test because more than 20% of its efforts to evaluate alternatives to eliminate uncertainties involve direct support activities, such as clerical and construction support.

II. IF THE CONSTRUCTION OF A PROTOTYPE IS CONSIDERED A RESEARCH ACTIVITY, IT IS ALSO AN “ELEMENT[] IN A PROCESS OF EXPERIMENTATION” UNDER SECTION 41(d)(1)(C).

As the foregoing analysis shows, there is no ambiguity as to whether direct supervision and direct support are research activities within the meaning of § 41(d)(1)(C). They are not. The Tax Court thus erred in concluding that direct support activities should be included in the denominator of the 80% test. But even if this Court were to conclude otherwise, the decision below should still be reversed. If the construction of a tanker for testing the efficacy of the newly-developed design is a research activity that gets included in the denominator, it is also an “*element[] of a process of experimentation*,” I.R.C. § 41(d)(1)(C) (emphasis added), that should also be included in the numerator. The Tax Court erred in ruling otherwise.

In its analysis, the Tax Court ignored the word “element” in § 41(d)(1)(C), and instead relied on the distinction § 41(b)(2)(B) draws between “engaging in qualified research” and “engaging in direct

supervision or direct support of research activities which constitute qualified research.” The Tax Court reasoned that the “fabrication of an experimental model and the use of that model in qualified research ... are, by definition, two different things. The latter is qualified research; the former is not.” Op. 32. This analysis misses the mark.

If constructing a pilot model is a research activity for purposes of the “substantially all” test, and the resulting labor costs therefore belong in the denominator, the dispositive issue is not whether the workers who build that model are themselves involved the conduct of research. Rather, the question is whether their activities are an “*element[] of a process of experimentation.*” The word “element” means “one of the constituent parts” of something. Webster’s Third New International Dictionary, 734 (1993). Building a physical component necessary to test the performance and reliability of a new design is an “element,” or “constituent part,” of a process of experimentation. Indeed, without such fabrication, the uncertainties pertaining to the design could not be evaluated and, ultimately, eliminated. *See Liker & Pereira, supra*, at 72 (prototyping is a risk reduction tool to reduce, *inter alia*, exposure to “technical uncertainty”) (citation omitted).

This is confirmed by the regulations implementing § 174. Those regulations, which define and explain “research and experimental expenditures,” state that a “pilot model” is a “representation or model of a product that is *produced to evaluate and resolve uncertainty* concerning the product during the development or improvement of the product.” 26 C.F.R. § 1.174-2(a)(4) (emphasis added). *See also id.*, Example 3 (research and experimental expenditures include costs of “materials and labor to produce a model that is used to *evaluate and resolve the uncertainty* concerning the appropriate design”) (emphasis added). Because a “process of experimentation” is “a process designed to *evaluate* one or more alternatives to achieve a result where the capability or the method of achieving that result, or the appropriate design of that result, *is uncertain*,” *id.* § 1.41-4(a)(5)(i) (emphases added), it necessarily follows that the activity of producing a prototype “to *evaluate and resolve uncertainty* concerning” a new or improved product, *id.* § 1.174-2(a)(4) (emphasis added), is an “element” of a process of experimentation.

Accordingly, if the construction activities associated with building a prototype are research activities for purposes of the 80% denominator,

those same activities are an element in a process of experimentation for purposes of the numerator.

CONCLUSION

For the foregoing reasons, the Tax Court's interpretation and application of the 80% test used to implement the "substantially all" standard of § 41(d)(1)(C) should be reversed.

Respectfully submitted,

/s/ Joseph R. Guerra

Joseph R. Guerra

Counsel of Record

Matthew D. Lerner

SIDLEY AUSTIN LLP

1501 K Street, NW

Washington, DC 20005

(202) 736-8000

jguerra@sidley.com

*Counsel for Amicus Curiae The
National Ass'n of Manufacturing*

CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of 7th Circuit Rule 29(d) because it contains 6,913 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(f).

2. This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and 7th Circuit Rule 32, and the type-style requirements of Federal Rule of Appellate Procedure 32(a)(6), because it has been prepared in a proportionally spaced typeface using Microsoft Word in 14-point Century Schoolbook font.

March 31 2022

/s/ Joseph R. Guerra
Joseph R. Guerra

CERTIFICATE OF SERVICE

I hereby certify that on March 31, 2022, I caused the foregoing Brief of *Amicus Curiae* The National Association of Manufacturers to be filed electronically with the Clerk of the Court for the United States Court of Appeals for the Seventh Circuit by using the CM/ECF system. I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the CM/ECF system.

March 31, 2022

/s/ Joseph R. Guerra
Joseph R. Guerra