

An Economic Evaluation of 'Funding' for Research Tax Credits

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In this article, Chodorow and Ledgerwood address the funding of contractors’ research and experimental activities for purposes of assessing research tax credit claims. Frequent disputes continue to arise regarding whether research conducted by contractors is funded. A recent summary judgment order in *Geosyntec* helped clarify the proper implementation of the funding standards by focusing on the structure of the contracting parties’ fee arrangement as dispositive proof of their allocation of the risk of failed research. The court held that a research provider’s claim is deemed unfunded if the qualified research was conducted under a fixed-fee contract rather than cost-plus contracts with capped fees.

Chodorow and Ledgerwood argue that the *Geosyntec* approach does not fully assess how different contractual terms allocate the risks of failure among the parties. They have developed an analytical method for assessing the risk and reward calculus using the principles of risk allocation found in microeconomic theory and contract law. The authors were economic consultants for the taxpayer in *Geosyntec* in its pretrial negotiations with the IRS.

A. Introduction

The Economic Recovery Tax Act of 1981 (ERTA) established a research tax credit (RTC),¹ allowing a taxpayer to claim a credit of 20 percent for qualified research expenses in a given tax year over a statutorily defined base amount.² Congress has continu-

ally extended this credit, emphasizing that “research is the lifeblood of our economic progress [and] effective tax incentives for research and development must be a fundamental element of America’s competitiveness strategy.”³ However, there is uncertainty about the implementation of some aspects of the RTC.⁴ This article focuses on uncertainty surrounding the ineligibility of “any research to the extent funded by any grant, contract, or otherwise by another person (or governmental entity).”⁵ This “funded research” exclusion has been a frequent topic of dispute between the IRS and taxpayers, beginning with the seminal case of *Fairchild Industries Inc. v. United States*⁶ and more recently in an order on summary judgment in *Geosyntec Consultants Inc. v. United States*.⁷ These two cases share the common element of rare taxpayer-favorable findings but leave unresolved key factors concerning funding and the later allocation of qualified credits.⁸ Clarity is needed to provide incentives for legitimate investments in research as contemplated by the congressional intent behind the RTC.

This article addresses the funding of research and experimental activities in a manner consistent with the legislative purpose of the RTC, case law, basic contract principles, and economic theory. Although *Geosyntec* has helped clarify the proper implementation of the funding standards, it does not fully assess how different contractual terms allocate the risks of failure among the parties in contracts requiring research expenditures. A research provider’s RTC claim is deemed unfunded if the qualified

for treatment as research and experimental expenditures under section 174; (2) the research is undertaken to discover technological information; (3) the information to be discovered is useful in the development of a new or improved business component of the taxpayer (e.g., a new product or process); and (4) substantially all of the research activities constitute elements of a process of experimentation. Section 41(d)(1)(A)-(C); reg. section 1.41-4(a).

³H.R. Rep. No. 100-1, pt. 2, at 88 (1988).

⁴Section 41(d)(4)(A)-(H).

⁵Section 41(d)(4)(H).

⁶71 F.3d 868 (Fed. Cir. 1995).

⁷2013 U.S. Dist. LEXIS 140185 (S.D. Fla. 2013).

⁸Note that for the purposes of this article, we will assume that all research discussed herein meets the eligibility requirements of section 41 and its regulations except for the issue of whether the research is funded within the meaning of section 41(d)(4)(H) and reg. section 1.41-4A(d).

¹Section 221 of ERTA. The RTC is codified at section 41. Although section 41’s formal title is “Credit for Increasing Research Activities,” tax practitioners refer to the credit by various short forms, including the RTC.

²Section 41(a)(1). Research is qualified for purposes of the RTC if (1) the expenses connected with the research are eligible

(Footnote continued in next column.)

research was conducted under a fixed-fee contract rather than other contracts containing similar fee arrangements (for example, cost-plus contracts with capped fees). We propose a more logical basis for assessing the risk/reward calculus underlying contracts requiring research using the principles of risk allocation found in microeconomic theory and contract law. This approach could bring logical cohesion to future RTC cases, allowing for the rightful ability of a researcher and its clients to claim the credits for qualified research expenditures based on concrete indicia of intent expressed in the language of the underlying contract.

B. Legislative Intent

Congress first enacted legislation under ERTA to provide an income tax credit as an incentive for U.S. businesses to increase their qualified research expenditures. The RTC was designed to address a market failure that leads to underinvestment in research by private investors. As explained in the legislative history to the recent renewal of the RTC in the American Taxpayer Relief Act of 2012:

Congress acknowledges that research is important to the economy. Research is the basis of new products, new services, new industries, and new jobs for the domestic economy. There can be cases where an individual business may not find it profitable to invest in research as much as it otherwise might because it is difficult to capture the full benefits from the research and prevent such benefits from being used by competitors. At the same time, the research may create great benefits that spill over to society at large. To encourage activities that will result in these spillover benefits to society at large, the government does act to promote research. Therefore Congress believes it appropriate to extend the present-law research credit.⁹

The RTC has been a subject of debate. Many have argued that the policy has been a cost-effective means of stimulating research that is necessary to keep U.S. enterprises competitive, given similar tax incentives provided in other countries. Others view the credit as nothing more than a corporate handout and as subject to corporate overreach. The effectiveness of the RTC as a tax incentive is an important policy question but beyond our scope here. The legislative intent behind the RTC is clear — subsidization of qualified research investments through tax credits. That was first affirmed in 1981, and it

⁹Joint Committee on Taxation, “General Explanation of Tax Legislation Enacted in the 112th Congress,” JCS-2-13, at 140 (Feb. 1, 2013).

has since been reaffirmed by the legislative and executive branches 15 times despite the program’s detractors. Although there are expectations that Congress will extend the RTC retroactively for 2014 — and perhaps go further by expanding it¹⁰ and making it permanent¹¹ — this is unlikely until after the 2014 midterm elections.¹²

ERTA defined the term “qualified research” to exclude “research to the extent funded by grant, contract, or otherwise by another person (or governmental entity).”¹³ The legislative history to ERTA explained that Congress intended the funded research exclusion to apply in the following situation:

The credit is not available for any activity performed for another person (or governmental entity), whether pursuant to a grant, contract, or otherwise. Thus, if a taxpayer contracts with a research firm, university, or other person for research to be performed on the taxpayer’s behalf, only the taxpayer which makes payments under the research contract and on whose behalf the research is conducted can claim the credit as those expenditures; the research firm, university, or other person which conducts the research on behalf of the other taxpayer cannot claim any credit for its expenditures in performing the contract.¹⁴

The above legislative history addresses a classic research contract in which the performance of the research is the deliverable. Research contracts can be differentiated from contracts that do not specifically require the performance of research as the deliverable but in which research may be required by the contractor to provide the products or services that constitute the deliverables. Congress did not explain to what extent, if at all, the funded research exclusion was intended to apply to the latter contracts.

The RTC statute does not define the term “funded” or explain how the exclusion would apply to research performed by a taxpayer under a contract or grant with a third party. Rather, Congress left the scope of the funded research exclusion to be addressed by the IRS in regulations. The

¹⁰See Dean Zerbe, “Happy Days for Research: Tax Extenders Clear Senate Finance With Expanded R&D Tax Credit,” *Forbes*, Apr. 4, 2014.

¹¹See Jia Lynn Yang, “There’s a War Over R&D Tax Credits. And Companies Keep Winning,” *The Washington Post*, Jan. 24, 2014.

¹²See David Malakoff, “U.S. House Passes Permanent R&D Tax Credit,” *Science*, May 9, 2014.

¹³Section 41(d)(4)(H).

¹⁴H.R. Rep. No. 97-201, at 116 (1981).

funded research regulation is reg. section 1.41-4A(d). This regulation ties the concept of funding to (1) whether the customer has agreed to pay the researcher to perform research on its behalf unconditionally (that is, even if the research fails to achieve its objectives); and (2) whether the taxpayer retains substantial rights in the research results. These criteria are akin to the considerations in an investment decision — that is, the researcher expects that the current and future benefits from its investment in the contract will exceed its expected costs but is subject to the risk that they will not.

The remainder of this article focuses on whether the past application of these regulations, along with later judicial precedent, is consistent with the economic rationale implied by the original congressional intent in excluding funded research as a qualified research expense.

C. Case Law Before *Geosyntec*

1. The *Fairchild* standard. *Fairchild* is the seminal case interpreting the RTC funding exclusion. It involved a government contract in which Fairchild Industries Inc., an aerospace manufacturer, agreed to develop a new pilot training aircraft for the U.S. Air Force. The contract contained more than 1,000 pages of technical specifications governing the design, construction, and performance of the new aircraft. It provided that the Air Force was obligated to pay for the results produced from Fairchild's research only if they met these contractual specifications, as established by a set of 11 line-item milestones. Fairchild would receive a fixed fee upon the completion of each milestone, subject to the Air Force's acceptance of the work as satisfactory. If the Air Force considered Fairchild's work associated with any line item unsatisfactory, it could (1) reject the work, (2) require Fairchild to correct the work at its own expense, or (3) accept the work at a reduced price. The contract provided for the Air Force to make bimonthly progress payments, which were effectively pre-acceptance advances or loans to finance Fairchild's work under the contract's line items. However, Fairchild had no right to retain those payments unless the line items to which they applied were accepted. Once the Air Force formally accepted a line item of work, any progress payments previously applied were "liquidated" against the fee cap attributable to that line item. The Air Force ultimately paid Fairchild \$120.6 million for its work under this contract.

In denying Fairchild's application for the RTC, the IRS argued that the Air Force's progress payments had funded the company's claimed research expenditures within the meaning of reg. section 1.41-4A(d). It maintained that the determination of whether research is funded does not depend on

whether the contract gives the government the right to not pay for unsuccessful research. The Court of Federal Claims agreed, noting that "the availability of the tax credit turns on the likelihood that the Air Force would pay Fairchild for the research conducted under the contract."¹⁵ The court further observed that Fairchild expected it would be paid and, in fact, was paid for its research. It concluded that because the research expenses were funded by the Air Force and Fairchild therefore did not itself incur them, the company was not entitled to the RTC.

On appeal, the Federal Circuit rejected the IRS's position and reversed the claims court decision. It reasoned that for a contract that contemplates the performance of research by the contractor, "the regulations implement allocation of the tax credit to the person that bears the financial risk of failure of the research to produce the desired product or result"¹⁶ — in other words, "the inquiry turns on who bears the research costs upon failure, not on whether the researcher is likely to succeed in performing the project."¹⁷ The Federal Circuit elaborated: "The statute is designed so that those who will bear the risk of financial loss can include the tax credit in their calculation of investment risk."¹⁸ Thus, the court explicitly contemplated that the party at risk for failure of the research (that is, research that costs more than expected) would consider the RTC a benefit in deciding whether to enter a particular contract. This judicial approach is consistent with the legislative intent of the RTC to enhance the investor's willingness to face the risks of failed research.

The notion of fee structure is central to the evaluation of financial risk. Contracts for which the researcher can expect all of its time and materials to be expended in performance of the contract's terms (cost-plus contracts) bear no risk regarding failure of the associated research and thus do not allow the researcher to qualify for the RTC. Conversely, if a fixed fee is imposed, the researcher bears the risk of cost overruns should its research prove unsuccessful. In *Fairchild*, the IRS argued that the research was funded because the contract called for the Air Force to make interim progress payments financing Fairchild's performance of the contract above any applicable fixed fees. However, the Federal Circuit rejected that argument because, as discussed above, the progress payments were simply pre-acceptance advances and became nonrefundable only once the

¹⁵71 F.3d at 872.

¹⁶*Id.* at 870.

¹⁷*Id.* at 873.

¹⁸*Id.* at 874 (emphasis added).

Air Force later accepted Fairchild's work. Thus, the progress payments, because of their contingent nature, did not shift the financial risk of research failures from Fairchild to the Air Force.

The Federal Circuit also found the restrictive acceptance provisions of the *Fairchild* contract relevant in determining funding risks. It held that the Air Force's unilateral right to reject Fairchild's performance "explicitly placed solely on Fairchild the risk of failure of every line item" under the contract.¹⁹ Under the acceptance clause, Fairchild "remained at risk for each line item until the research was successfully completed and the product of the research was accepted."²⁰ Accordingly, the contract was not funded, even though the Air Force had paid Fairchild more than \$120 million for its work on the project. *Fairchild* thus stands for the proposition that in a contractual arrangement under which a customer agrees to pay a third party to provide a product or service that relies on research, the party to whom the contract allocates the financial risk that the research will fail is entitled to claim the RTC. The contract in *Fairchild* explicitly placed that risk on Fairchild by giving the Air Force the right to reject the work and refuse payment, to recoup progress payments, and to force Fairchild to correct its work at its own expense.

2. The Lockheed Martin standard. The Federal Circuit in *Fairchild* did not address the second requirement of reg. section 1.41-4A(d), which would concern whether Fairchild retained substantial rights to the research performed under the contract. The IRS did not dispute that point. The seminal case on this issue is *Lockheed Martin Corp. v. United States*.²¹ It involved RTC claims by aerospace manufacturer Lockheed Martin Corp. based on research expenses it had incurred in performing fixed-price defense contracts with the federal government. The contracts gave the government, as the contract sponsor, significant rights to the results of Lockheed's research, including "an unlimited right to use Lockheed Martin's technical data and disclose it to third parties."²² The contracts also required Lockheed Martin to reimburse the government for one-time costs if it intended to license or sell the technology developed for the government to third parties.

In light of those provisions, as well as extracontractual usage restrictions found in national export control laws and security classifications, the IRS argued that Lockheed Martin's rights to the re-

search performed under the fixed-price contracts had no practical value and left it with no substantial rights in the research. Lockheed Martin contended that despite the rights given to the government under the fixed-price contracts, the company retained the right to use the research results in its business and thus retained substantial rights in that research. In considering that argument, the Federal Circuit explained that the provisions of reg. section 1.41-4A "imply two scenarios in which the taxpayer's research will be considered 'funded' by another person."²³ The first, consistent with the earlier *Fairchild* decision, is when the taxpayer's research will be paid for by another person regardless of whether the research succeeds. The second scenario "is when the taxpayer agrees to perform research for another person without retaining 'substantial rights' to its research — when the person for whom the research is performed has 'the exclusive right to exploit the results of the research' and the taxpayer 'must pay for the right to use the results of the research.'"²⁴

Based on the relevant statutory and regulatory language, the Federal Circuit sided with the taxpayer: "The right to use the research results, even without the exclusive right, is a substantial right."²⁵ Despite the government's extensive rights in the research performed under the fixed-price contracts and the requirement to pay the government if Lockheed Martin intended to sell the technology, the Federal Circuit concluded that the company's right to use that research in its own business without having to pay the federal government was determinative of the substantial rights issue:

The government concedes that the [fixed-price contract] provisions give Lockheed Martin the right to use its research in its business. *Such a right is clearly substantial.* It permits Lockheed Martin to manufacture and sell up-to-date products meeting the needs of its customers.²⁶

Accordingly, *Lockheed Martin* establishes that a researcher possesses substantial rights in its research for purposes of the funded research exclusion as long as it retains valuable rights to use the research results in its trade or business without having to pay the customer, even if the researcher's rights in the research are not exclusive. In a contract in which the researcher faces financial risk for research outcomes, the researcher would recognize the benefits from use of that research in the cost benefit calculus underlying its decision to enter into

¹⁹*Id.* at 873.

²⁰*Id.*

²¹210 F.3d 1366 (Fed. Cir. 2000).

²²*Id.* at 1370.

²³*Id.* at 1374.

²⁴*Id.*

²⁵*Id.* at 1375.

²⁶*Id.* at 1376 (emphasis added).

that contract. A researcher making the investment decision to enter into a contract with these terms then faces risks and rewards similar to those that a taxpayer conducting research on its own behalf would face, and thus, the granting of RTCs is consistent with the legislative intent.

D. Administrative Guidance

The IRS has interpreted *Fairchild* in field advice. In non-docketed Service advice review (NSAR) 20350,²⁷ the IRS addressed whether costs incurred under contracts for architectural, engineering, construction management, and other consulting services were funded. It reasoned that contracts for professional services are generally funded because design professionals typically warrant only that they will comply with professional standards and thus will be paid for their work as long as they perform in a non-negligent manner. NSAR 20350 concluded that by contrast, “design and build” contracts involving both the design and construction phases of a project are generally unfunded because the contractor has an implied duty to provide substantial performance rather than merely exercising the diligence of a competent professional. NSAR 20350 effectively constrains a researcher’s ability to claim the RTC even in the presence of contractual language ensuring the buyer’s right of conditional acceptance, since the absence of a warranty provision that explicitly requires specific performance could tend to negate the researcher’s claim that it bore the true risk associated with unsuccessful research.

The IRS has also provided guidance on the assessment of an RTC claimant’s right to future benefits from the research anticipated under specific contracts. In NSAR 20350, the IRS concluded that “except where a contract has explicit provisions granting ownership of all intangible or intellectual property (not merely designs, specifications, blueprints and the like) to the client, [the taxpayer] retains substantial rights.” Under that rationale, the only instance in which a researcher would not have substantial rights is when a contract explicitly grants the customer all ownership rights in the IP resulting from the research. However, in subsequent litigation, *Union Carbide Corp. v. Commissioner*,²⁸ the IRS argued that a taxpayer’s experimental plant test was funded because the relevant contract required the researcher to license the tested product from the vendor if the test was ultimately successful. The Tax Court rejected that argument based on its findings that the taxpayer

had retained all rights to use the results of its plant tests and that the information it gained from the research was valuable to the researcher regardless of whether the resulting product was ultimately licensed. This latter finding suggests that courts interpret more broadly than the IRS the extent to which a taxpayer reserves substantial rights to future benefits derived from specific research.

Additional administrative guidance was provided in NSAR 1401F,²⁹ which concluded that research performed by an engineering firm under six representative contracts was funded because the clients’ payments under the contracts were not specifically contingent on the success of the research. Thus, it appears that the IRS’s most recent administrative position is that research performed by taxpayers under contracts will be treated as funded and ineligible for the RTC unless there are contractual provisions like those in *Fairchild* that make the client’s payments specifically contingent on the success of the research activities. NSAR 1401F suggests that absent *Fairchild*-like acceptance provisions, research performed under a contract will be presumed funded unless proven otherwise in a court of law.

The economic effect of that presumption simultaneously reduces the potential researcher’s perceived benefits and adds to its likely costs, thus making it less likely to risk investing in otherwise valuable research activity. This hinders the legislative purpose for which the RTC was passed and repeatedly renewed — an outcome that will continue absent modification of the standards of proof required to obtain the credit.

E. *Geosyntec*

Geosyntec addressed whether otherwise qualified research that an environmental engineering firm conducted on behalf of clients under contractual arrangements was funded within the meaning of reg. section 1.41-4A(d). The taxpayer and the government agreed to have the issue adjudicated by reference to six sample contracts. Three of them called for fixed-fee payments by the clients. The other three were cost-plus contracts subject to a negotiated cap or maximum fee (the cost-plus with a maximum (CPM) contracts). Consistent with *Fairchild*, the court held that the totality of the provisions under the fixed-fee contracts placed the risk of failed research on the researcher such that its research investments under the contracts were not funded. However, the court held that the contractor’s risk of nonpayment under the CPM contracts

²⁷2002 WL 32168014 (Aug. 21, 2002).

²⁸T.C. Memo. 2009-50.

²⁹2012 WL 1240762 (Mar. 7, 2002).

was not significant enough to render them unfunded, and thus, that research was funded and ineligible for the RTC.

The *Geosyntec* decision can be viewed as undercutting the IRS's position in NSAR 1401F that all research performed under a contract is funded by the customer's payments unless the contract contains acceptance provisions virtually identical to those in *Fairchild*. One set of commentators described the implications of *Geosyntec* for the scope of the funded research exclusion as follows:

The IRS's overly restrictive concept of what constitutes funded research has been dealt a serious blow by the *Geosyntec* court's solidification of the view that an analysis of funded research should be conducted using only the principles of contract law, *dismissal of the idea that the regulations contemplate solely the inclusion of research-related costs above the funding actually received, and recognition that a proper analysis requires review of the language of a contract in its totality.*

Because of *Geosyntec*, IRS examiners hopefully will recognize that *businesses face risk in a fixed payment contract when the business owners have to cover all research costs, profits, and potential loss associated with a fixed payment arrangement.*

...

Although the government attempted to argue otherwise, the *Geosyntec* court reminded us that *commercial research must be reviewed in the context of the marketplace with all of its attendant constraints.* Unlike university or grant-based research, commercial research typically proceeds incrementally and with a specifically intended consumer awaiting the results. *It is rarely, if ever, undertaken without an attempt to balance the risks to the ongoing business concern as a whole against the need to innovate and modernize.*³⁰ [Emphasis added.]

The *Geosyntec* litigation remains pending, and the district court's holding on the funded research issue is on appeal. However, as the commentators note, this decision recognizes that the researcher's choice to execute a contract that may require an investment beyond the amount originally contemplated is based on a cost benefit calculus that considers many factors, as construed across the contract in its totality.³¹

³⁰Zerbe et al., "Risk Has Its Rewards: Good News for Businesses on R&D," *Tax Notes*, Aug. 19, 2013, p. 829.

³¹The court in *Geosyntec* was not asked to address whether the rights to future benefits of the research under the contracts were substantial within the meaning of reg. section 1.41-4A(d).

The *Geosyntec* holding creates a logical conundrum regarding the distinction between fixed-fee and CPM contracts. If the contractor assumes the monetary risk of unsuccessful research in performing tasks under a fixed-fee arrangement, why would that risk disappear if remuneration is constrained to time and materials expended subject to a cap that shifts risk to the researcher?³² Indeed, all else being equal, the CPM contract then presents the researcher with even greater risk than the fixed-fee contract because the possibility of profiting from efficient performance (that is, successfully completing the research and associated project at a cost below the cap) is removed in a CPM arrangement. To better understand why this is so, we next reconcile the economic and contractual foundation of the risk/reward calculus anticipated by the RTC.

F. The Economics of Risk/Reward in Contracts

From an economic perspective, contracts exist to define the terms of mutually beneficial trade between the contracting parties.³³ The expected value of a contract is recognized through the performance of its terms.³⁴ Contracts allocate the financial risks and rewards associated with performance of these terms between the parties, as agreed to by the

³²This discussion assumes the researcher expects that the fixed fee or fee cap agreed to could bind. Caps that have no realistic expectation of binding do not shift risk to the researcher.

³³This is a foundational concept for all microeconomic theory involving cooperative bargaining. See John F. Nash Jr., "The Bargaining Problem," 18 *Econometrica* 155 (Apr. 1950) (the origin of the concept of "Nash Equilibrium" and cooperative game theory, as featured in the film *A Beautiful Mind*). Yulie Foka-Kavalieraki and Aristides N. Hatzis have observed: "In a given transaction, when ex ante A values a widget at €10 and B at €15, if an exchange among them takes place, both will end up richer ex post. If the stipulated price is €12, then A ends up with €12 instead of owning a widget that he values at €10; B now owns a widget that he values at €15, plus €3 (his consumer surplus), totaling €18. They both became €5 richer — €5 being the surplus created by their transaction. Society is also €5 richer." Foka-Kavalieraki and Hatzis, "The Foundations of a Market Economy: Contract, Consent, Coercion," 9 *European View* 29 (2009).

³⁴Robert Cooter and Melvin Aron Eisenberg, "Damages for Breach of Contract," 73 *Cal. L. Rev.* 1432 (1985):

If the injured party had made the forgone contract instead of the actual contract, it is possible that the forgone contract would also have been breached. In many cases, however, the probability of breach is small. As the probability of breach approaches zero, the expected value of a contract approaches the value of performance. This in turn implies that the opportunity cost of a forgone contract approaches the value of performance of a contract that is made.

parties at the time of the contract's formation.³⁵ As applied in the RTC setting, the party funding a contract involving qualified research expenditures is the party that bears the risks and rewards of the research to be performed under that contract's terms. This is consistent with the Federal Circuit's reasoning in *Fairchild*, which established that a taxpayer's eligibility to claim the RTC requires proof that it bore the risk of failed research and would capture future benefits if that research proved successful.

A research provider's decision to enter into a contract requiring it to perform new research is based on an economic assessment of the expected risks and rewards presented by the contract's terms. To be willing to enter the contract, the total expected profits derived by the researcher from successful research (and, thus, successful performance) must at least equal the profits that it could achieve through diverting the resources required to perform on that contract to alternative business opportunities — an economic concept recognized generally as the researcher's opportunity cost.³⁶ Whether the contract can achieve the contractor's opportunity cost is a function of (1) its expected profits derived directly from executing the contract, (2) the expected costs associated with the risk of failing to perform, and (3) any profits it expects to derive from future business opportunities reserved under the contract's terms and made possible by the associated research.

It follows that the researcher will not enter a contract if the expected risks and rewards allocated by its terms yield expected profits insufficient to cover its next best profit-maximizing alternative. However, as the reasoning in *Fairchild* suggests, there is some trade-off between these factors. For example, the researcher may accept greater costs associated with the risk of failed research in return for greater (or more certain) profits directly derived from the contract or from future business opportunities created from the associated research. All else equal, investors place greater value on expected cash flows with lower risk, making contracts with some measure of certainty preferable to those with

less certain or speculative payments. For that reason, the type of payment mechanism specified in the contract is critical, as are provisions such as warranties or other conditional acceptance provisions that shift risk to the research provider, and other provisions that grant (or deny) its rights to the future business opportunities created from the research.

1. The type of payment mechanism. Contract provisions specify different payment mechanisms to allocate the risks of failed research and the rewards of successful research to the research provider. One common mechanism is a fixed-price contract under which the researcher receives a fixed lump sum payment for the performance of the contract (or for the completion of a milestone or other stated goal in a multistage contract).³⁷ Those contracts place the actual cost of performance and the financial risk of failure to perform squarely on the research provider, but they also provide an opportunity for the researcher to profit from efficient performance.³⁸ Every dollar the researcher expends in performance of the contract's terms thus reduces its profit; higher-than-expected research costs can cause the researcher's expenditures to exceed the lump sum paid by the buyer, effectively making performance economically undesirable but unavoidable.³⁹ It is for this reason that the court in *Geosyntec* properly recognized that fixed-fee contracts place the risk of failed research squarely on the researcher provider, thus entitling it to claim the RTC for all qualified research performed under the contract's terms.

A different type of pricing mechanism arises in cost-plus contracts in which the researcher is guaranteed compensation for all the time and materials

³⁵See generally Walter Nicholson, *Microeconomic Theory: Basic Principles and Extensions* (1995), at 229-236 (value of a contract is in promoting the gains from trade and allocating risk between the parties).

³⁶"When economists refer to the 'opportunity cost' of a resource, they mean the value of the next-highest-valued alternative use of that resource." David R. Henderson, "Opportunity Cost," *The Concise Encyclopedia of Economics* (2008). See also Shaun D. Ledgerwood, "Rethinking the Theory of Efficient Breach: An Approach Based in Industrial Organization," PhD thesis, Department of Economics, University of Oklahoma (1997).

³⁷"Time to completion, project complexity, construction change orders, and risk management are the fundamental problems in the contracting environment. In a fixed price contract, the contractor (seller) receives a lump sum payment irrespective of the costs actually incurred." Patrick Bajari and Steven Tadelis, "Procurement Contracts: Fixed Price vs. Cost Plus," at 2 (Mar. 15, 1999).

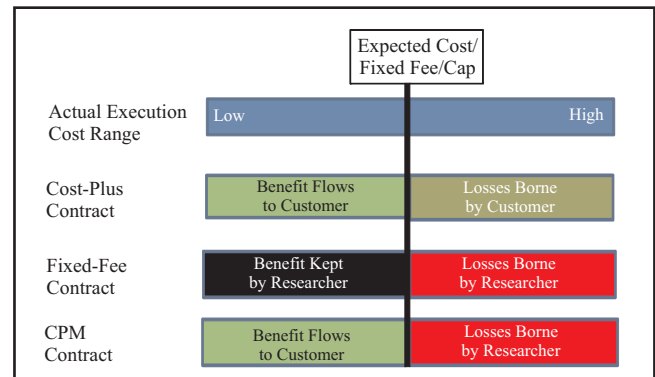
³⁸"Indeed, the use of fixed price contracts for projects with [an] uncertain process can encourage the contractor to find the best work methods independent of the owner. This can help achieve goal alignment as the contractor increases their profit while finding the best solution for the owner." John Rodney Turner, "Project Contract Management and a Theory of Organization," ERIM Report Series Reference No. ERS-2001-43-ORG, at 6 (July 20, 2001). "Indeed, the contractor can make additional profits from managing the risk, as long as they understand it when they bid for the contract. The contractor buys the risk off the client and makes profits from managing it." *Id.* at 7.

³⁹That is, if the seller's costs, including research and opportunity costs, exceed the fixed price, the seller will lose money on the contract and thus be worse off than it would have been even if it had never entered into the contract.

of the effort it expends in performance.⁴⁰ In contrast to fixed-fee provisions, cost-plus contracts tend to shift significant performance risk to the buyer because it bears the risk that research costs could exceed the parties' expectations.⁴¹ Likewise, while the research provider incurs less performance risk under a cost-plus contract, it loses some upside potential if it efficiently performs. A hybrid of fixed-price and cost-plus pricing provisions is used in CPM contracts. Those provisions restrict the researcher's compensation to time and materials expended up to a specified price cap. The buyer in those contracts simultaneously benefits from the research provider's potential efficiency and is protected against cost overruns in excess of the cap.⁴²

An illustration of the risks and rewards for cost-plus, fixed-fee, and CPM contracts can be used to evaluate how these different payment terms distribute the risks and rewards regarding contracts. The figure presents a simple illustration of this distribution assuming that a fixed fee is identical to the cap set for an equivalent CPM contract, when both equal the expected cost of executing the contract under a cost-plus fee structure. The contract has a range of possible execution costs, some below the expected cost (equal to the fixed fee or cap) and others above. For the cost-plus contract, the risk of unsuccessful research is borne by the customer, but it also keeps the benefits of successful research — with success defined as meeting research goals without excessive costs. The researcher in a fixed-fee contract is at risk of incurring higher-than-expected costs but will benefit if the costs are less than expected. By comparison, the CPM contract benefits the customer to the detriment of the

researcher under either circumstance, because the customer retains the benefits of successful research (that is, lower-than-expected research costs) while receiving protection from higher-than-expected costs if they arise.



The payoffs in fixed-fee contracts are more symmetrical in a crucial characteristic — the party bearing the risk of loss also receives the rewards of efficient performance.⁴³ However, the payouts for CPM contracts are asymmetrical — the researcher bears the risk of loss, but the benefits of efficient research flow back to the customer. Thus, a CPM contract with a cap poses greater risks to the contractor than a fixed-fee contract with the fee equal to the cap because the contractor then shoulders equivalent performance risk while forfeiting the upside potential of efficient performance.⁴⁴

The court in *Geosyntec* concluded that unlike fixed-fee contracts, the researcher's CPM contracts were funded for RTC purposes. The court did not describe the basis for that finding. However, as the figure demonstrates, the introduction of an economically binding fixed-price component to a cost-plus contract shifts the rewards associated with efficient, successful research from the researcher to the buyer, while shifting the risks of unsuccessful or costly research from the buyer to the researcher. The allocation of risk by the CPM mechanism therefore leaves the researcher with a "heads I lose, tails I break even" payoff structure. These risks of failed research under a CPM contract are more stringent

⁴⁰"Cost-Plus: The contractor is repaid all their expenses, plus an agreed profit margin. The agreed profit margin can be a percentage of the out-turn cost (cost plus percentage fee), or a fixed amount (cost plus fixed fee). Whatever the contractor spends on painters and decorators, paint and wallpaper, is refunded, even if the unit rates are excessive and productivity rates are low." Turner, *supra* note 38, at 5.

⁴¹"Cost-plus contracts are necessitated by the inability or unwillingness of firms to bear the risks. The government has superior risk bearing ability and so the burden is shifted to it. It is then enabled to buy from firms on the basis of their productive efficiency rather than their risk bearing ability, which may be only imperfectly correlated." Kenneth Arrow, "Economic Welfare and the Allocation of Resources for Invention," *Rate and Direction of Inventive Activity: Economic* 609-626 (1962).

⁴²"A second example is the cost-plus contract in one of its various forms. When production costs on military items are highly uncertain, the military establishment will pay, not a fixed unit price, but the cost of production plus an amount which today is usually a fixed fee. Such a contract could be regarded as a combination of a fixed-price contract with an insurance against costs. The insurance premium could be regarded as the difference between the fixed price the government would be willing to pay and the fixed fee." *Id.* at 6.

⁴³This need not imply perfect symmetry.

⁴⁴The illustration above assumes that the expected cost, fixed fee, and cap would all be set at the same level. However, a researcher will require that the average outcome under the contract leave them whole, despite the asymmetry. Therefore, all else equal, a researcher in a CPM contract would require a cap that exceeds the expected cost or fixed fee to equal the expected value of the two types of contracts. While this compensates the researcher *on average* for the asymmetry, and so provides mutually acceptable terms, the researcher still bears the cost of actual failures without receiving the benefits of actual successes. Thus, the researcher still bears the risk.

than the types of risks faced by the seller under fixed-fee contract structures, a feature that should have led the court in *Geosyntec* to find that CPM contracts, like fixed-fee contracts, were unfunded, assuming that there was a realistic possibility that the cap could be binding.

2. The right of conditional acceptance (or revocation of acceptance). Contract terms that grant the buyer the ability to evaluate and reject the result of the research provider's performance can also be used to allocate financial risks and rewards between the contracting parties. A key mechanism used to shift the financial risk of performance from buyers to sellers is the adoption of contract terms that make performance conditional on the acceptance of the buyer or a third party, such as a governmental regulatory agency.⁴⁵ Those terms shift financial risk away from the buyer and increase the seller's uncertainty concerning the adequacy of its performance. Clearly, the extent to which satisfaction of the criteria required for performance depends on the subjective opinion of the buyer or a third party can exacerbate a researcher's financial risk, thus increasing the likelihood that it will fail to recognize its expected profits from the contract.

Two other types of contractual provisions that create uncertainty regarding the adequacy of the seller's performance are warranties and indemnification provisions. Warranties may be defined by the contract's terms (an express warranty) or derived from the common law (an implied warranty).⁴⁶ In either event, the effect is to further shift financial risk from a buyer to a seller beyond the performance of the contract, again increasing the likelihood that the seller could fail to cover its opportunity costs because of the probability of incurring additional expenses *ex post* performance.⁴⁷ Indemnification clauses can also allocate risk between the contracting parties.⁴⁸ Whereas a

warranty represents an assurance about the quality of the contract's outcome derived from the seller's performance, indemnity clauses may ensure reimbursement for a variety of losses accrued as a result of the contract, including those that are ancillary to performance.⁴⁹ For the RTC, any contractual terms that give the buyer the unilateral ability to reject or revoke prior acceptance of performance will shift the risk of nonperformance from the buyer to the researcher, thus reducing its net expected benefits from the contract.⁵⁰

3. Allocation of post-performance financial rewards. A contract may also allocate rights concerning expected future rewards derived from the contract. The contracting parties will consider the overall profitability of the contract relative to their opportunity costs before assenting to the agreement. In the negotiation process wherein a researcher weighs the relative expected benefits and costs of various contract provisions, it should be more willing to accept less favorable terms regarding contract pricing and performance in exchange for greater rights to future benefits from the contract's results. For example, the researcher might be willing to accept a fixed fee as opposed to a guaranteed payment of all time and materials in exchange for the benefit of having free use of the results of its research to attract new business or perform future assignments. It is therefore logical that reg. section 1.41-4A considers the researcher's preservation of its rights to future benefits from the contract in assessing whether it is funded from the

set out in the contract then one party is in breach of the agreement. The other, aggrieved, party can seek compensation according to the methods set out in the contract and, if this does not succeed, then ultimately via the legal system.

This approach to risk allocation is called the entrenchment of rights approach because each party has specifically defined rights and obligations. It is also sometimes called the default-compensation approach because a default of the contract leads to a claim for compensation by the aggrieved party due to a breach of contract. This is the most clear and certain of all the approaches to risk allocation.

⁴⁹The economic purpose of mutual indemnity clauses is to shift risk to the party that can bear that risk at the lowest cost. See Richard Posner, *Economic Analysis of the Laws*, at 189 (1992). By comparison, indemnification clauses that shift risk to one party raise exclusively that party's costs, without providing this coincident benefit, thus increasing the risk that the contract will prove unprofitable even in the event of otherwise successful performance.

⁵⁰Acceptance of commercial goods under the Uniform Commercial Code provides a useful analogy for performance acceptance. Even after a buyer accepts goods, that acceptance may be revoked if it was under reasonable but unsubstantiated assumptions. Moreover, "a buyer who so revokes has the same rights and duties with regard to the goods involved as if he had rejected them." U.C.C. section 2-608.

⁴⁵See generally Cooter and Thomas Ulen, *Law and Economics* 423-426 (1988).

⁴⁶*Id.* at 423-430.

⁴⁷"The insurance motive is based on the idea that consumers are risk-averse whereas firms are risk-neutral. With different attitudes toward risk, sellers provide buyers with insurance against the event of product failure in the form of warranty contracts. . . . Sellers do not care about any transfer of income which leaves expected profits unchanged. Therefore, sellers are willing to take over the income risk from buyers in the form of a warranty." W. Emons, "The Theory of Warranty Contracts," 3 *J. Econ. Surveys* 43-57 (1989).

⁴⁸R.H. Arndt, "Getting a Fair Deal: Efficient Risk Allocation in the Private Provision of Infrastructure," unpublished PhD thesis, at 127 (2000):

The traditional, contractual, approach to risk allocation was to clearly allocate specific risks to the various parties by allocating a clear responsibility on one party or the other. If a risk eventuated but was not handled in the way

(Footnote continued in next column.)

researcher's perspective, because giving the researcher rights to a potential stream of future revenues tends to cause it to accept greater financial risk regarding performance.⁵¹

G. Conclusion

Congress views the policy of providing incentives for research through the RTC as a worthy goal. For Congress to further that goal, it is important that the standards for evaluating research conducted in the performance of contracts award RTCs to the intended recipients — the parties that are facing the risks of unsuccessful research. The *Geosyntec* holding recognizes the importance of evaluating the relative risks and rewards associated with research conducted under contracts. The court in *Geosyntec* concluded that fixed-fee contracts shift risks and rewards to the researcher. That standard is consistent with legal and economic principles and is grounded in the researcher's evaluation of the relative risks and rewards when the contract was signed. A researcher's investment decision to enter into a contract considers those and other factors that affect its cost benefit calculus, including the buyer's right to conditional acceptance and the researcher's right to retain the benefits derived from its successful research.

In light of the legislative purpose of the RTC — to stimulate inherently risky research activities — courts and the IRS should apply a similar approach when evaluating whether research is funded, weighing the benefits of the contract's fees and rights to future benefits against costs associated with the risk of unsuccessful research. Evaluating

⁵¹This was not raised in *Geosyntec*, although the court stated: "This retention of rights issue is a significant one and could very well change the analysis of some contracts. The Court, while troubled about not considering this second scenario, will go forward with the analysis of the contracts without considering this issue, as requested by the parties, who believe they may be able to resolve the case, at least partially, without considering the retention of rights." *Geosyntec*, 2013 U.S. Dist. LEXIS 140185 at *23.

RTC claims in that manner could provide a logical and consistent basis for processing future claims.

There remain a few obstacles. One is the need to include contracts containing a CPM fee structure within the universe of potentially unfunded contracts. Indeed, other things being equal, CPM contracts shift even more risk to the researcher than do fixed-fee contracts, because the researcher then forfeits the benefits of efficient performance while retaining the same risk of failed performance associated with a fixed fee. A second concern, which is outside the scope of this article but implicit in its application, is whether the buyer of the research should automatically receive the RTC (assuming it is eligible to benefit from that claim) for qualified research performed when the research provider's efforts are deemed to be funded based on the standards discussed (for example, if the contracts are performed on a cost-plus basis). This raises the possibility that future RTC claims could be pursued jointly by both contracting parties. If research expenditures are qualified but considered funded, the buyer faces the risks and rewards of the research investment and should logically receive the credit. In the future, the allocation of the credit between the contracting parties could then be defined in accordance with agreements in the underlying contract, serving as evidence of the parties' intent to allocate the associated risk.

The standard for defining funded research is important. If the hurdle is too high, the resulting denial of the RTC will discourage American businesses from undertaking the research that Congress sought to encourage through the credit. If the hurdle is too low, the government will be providing subsidies to those that would have conducted research anyway. We believe that our recommended approach based on the economics of risk and reward allocation for contracts will lead to an outcome that is consistent with the congressional intent underlying the RTC, thus giving credit where credit is due.