148 T.C. No. 8

UNITED STATES TAX COURT

AMAZON.COM, INC. & SUBSIDIARIES, Petitioner v.
COMMISSIONER OF INTERNAL REVENUE, Respondent

Docket No. 31197-12. Filed March 23, 2017.

In 2005 P entered into a cost sharing arrangement (CSA) with S, its Luxembourg subsidiary. Pursuant to the CSA, P granted S the right to use certain pre-existing intangible assets in Europe, including the intangibles required to operate P's European website business. This arrangement required S to make an upfront "buy-in payment" to compensate P for the value of the intangible assets that were to be transferred to S. See sec. 1.482-7(a)(2), (g)(2), Income Tax Regs. Thereafter S was required to make annual cost sharing payments to compensate P for ongoing intangible development costs (IDCs), to the extent those IDCs benefited S. See id. paras. (a)(1), (d)(1). As consideration for the transfer of pre-existing intangibles, S made a $254.5 million buy-in payment to P.

Applying a discounted cash-flow (DCF) methodology to the expected cash flows from the European business, R determined a buy-in payment of $3.6 billion, later reduced to $3.468 billion. P contends that R's DCF methodology is substantially similar to that rejected by this Court in Veritas Software Corp. v. Commissioner, 133

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T.C. 297 (2009). P contends that R's determinations are arbitrary, capricious, and unreasonable and that the comparable uncontrolled transaction (CUT) method is the best method to calculate the requisite buy-in payment.

P used a multistep allocation system to allocate costs from its various cost centers to IDCs. See sec. 1.482-7(d)(1), Income Tax Regs. (providing that costs "must be allocated between the intangible development area and the other areas or business activities on a reasonable basis"). While accepting P's allocation method in many respects, R determined that 100% of the costs captured in one important cost center ("Technology and Content") must be allocated to IDCs. P contends that R's determination to allocate to IDCs 100% of the Technology and Content costs is inconsistent with the regulations.

1. Held: R's determination with respect to the buy-in payment is arbitrary, capricious, and unreasonable. Veritas Software Corp. v. Commissioner, 133 T.C. 297, followed.

2. Held, further, P's CUT method, with appropriate upward adjustments in numerous respects, is the best method to determine the requisite buy-in payment.

3. Held, further, R abused his discretion in determining that 100% of Technology and Content costs constitute IDCs.

4. Held, further, P's cost-allocation method, with certain adjustments, supplies a reasonable basis for allocating costs to IDCs.

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Murphy, Royce L. Tidwell, Carl T. Ussing, Hans D. Gerling-Ritters, Nicholas A. Zemil, and Paul M. McLaughlin, for petitioner.

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LAUBER, Judge: The Internal Revenue Service (IRS or respondent) determined, for 2005 and 2006 respectively, deficiencies in petitioner's Federal income tax of $8,380,790 and $225,653,149.[1] These deficiencies arose from a series of transactions by which Amazon.com, Inc., and its domestic subsidiaries (collectively, Amazon US) transferred to Amazon Europe Holding Technologies SCS (AEHT), a Luxembourg subsidiary, the intangible assets required to operate petitioner's European website business. Invoking section 482, the IRS made substantial transfer-pricing adjustments reallocating income to Amazon US from AEHT.

From its inception through 2005 Amazon US owned the intellectual property in question. In 2004 Amazon US and AEHT entered into a "cost sharing

[1]Unless otherwise indicated, all statutory references are to the Internal Revenue Code in effect for the tax years at issue, and all Rule references are to the Tax Court Rules of Practice and Procedure. We round all dollar amounts to the nearest dollar.

arrangement." See sec. 1.482-7(a)(1), (b)(1), Income Tax Regs.[2] This arrangement required AEHT to make an up-front "buy-in payment" to compensate Amazon US for the value of the intangible assets that were to be transferred to AEHT. See id. paras. (a)(2), (g)(2). Thereafter AEHT was required to make annual cost sharing payments to compensate Amazon US for ongoing intangible development costs (IDCs), to the extent those IDCs benefited AEHT.

In a series of transactions in 2005 and 2006 Amazon US transferred to AEHT three groups of intangible assets: (1) the software and other technology required to operate petitioner's European websites, fulfillment centers, and related business activities; (2) marketing intangibles, including trademarks, tradenames, and domain names relevant to the European business; and (3) customer lists and other information relating to petitioner's European clientele. After concessions,[3] this case requires the Court to decide two main issues: the proper amount of AEHT's buy-in obligation with respect to the assets thus transferred; and the vol-

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[2]Section 1.482-7, Income Tax Regs., was redesignated section 1.482-7A, Income Tax Regs., with the promulgation of new regulations effective January 5, 2009. See T.D. 9441, 2009-7 I.R.B. 460.

[3]On May 30, 2014, the parties filed a stipulation of settled issues reflecting their settlement of an issue captioned "Cost Sharing Acquired Intangibles Buy-In." Petitioner conceded this issue in full and agreed that its taxable income would accordingly be increased by $4,881,993 for 2005 and $2,548,165 for 2006.

ume of petitioner's costs properly treated as IDCs (the larger the volume, the larger the cost sharing payments that AEHT must make).

On the first issue, petitioner originally reported a buy-in payment from AEHT of $254.5 million, to be paid over seven years. In determining the value of the transferred assets, petitioner assumed that each group of assets (website technology, marketing intangibles, and customer information) had a seven-year useful life.

On examination of petitioner's returns, the IRS concluded that the buy-in payment had not been determined at arm's length. See sec. 1.482-7(g)(2), Income Tax Regs. In respondent's view, the transferred property had an indeterminate useful life, and it had to be valued, not as three distinct groups of assets, but as integrated components of an operating business. Applying a discounted cash-flow (DCF) methodology to the expected cash flows from the European business, the IRS determined a buy-in payment of $3.6 billion, later reduced to $3.468 billion.

Petitioner contends that respondent's DCF methodology is substantially similar to that rejected by this Court in Veritas Software Corp. v. Commissioner, 133 T.C. 297 (2009), nonacq., 2010-49 I.R.B. (2010). Petitioner disputes the conceptual soundness of that methodology as applied here, contending that it treats short-lived intangibles as if they had perpetual useful lives. The result, according

to petitioner, is to inflate the buy-in payment by improperly including in it the value of subsequently developed intangible property. See sec. 1.482-7(g)(2), Income Tax Regs. (requiring that the buy-in payment reflect only pre-existing intangibles).

To value the pre-existing intangibles properly, petitioner contends that each group of transferred assets must be valued separately under the "comparable uncontrolled transaction" (CUT) method. On the basis of expert testimony at trial,[4] petitioner contends that the website and related technology had a value when transferred between $117 million and $182 million; that the marketing intangibles had a value when transferred between $115 million and $165 million; and that the customer information had a value when transferred between $52 million and $66 million. This would yield a buy-in payment ranging from $284 million to $413 million. Citing testimony by his trial experts, respondent urges substantially higher values for each group of assets in the event we reject his DCF method.

With respect to ongoing cost sharing payments, we must address two distinct issues. The first is essentially a tax accounting question, requiring that we determine "all of the costs incurred * * * related to the intangible development

[4]An alphabetical list of petitioner's and respondent's expert witnesses, together with a short resume of each, appears in the appendix to this Opinion.

area." Id. paras. (b)(2), (d)(1), (f)(1). Petitioner used a multistep allocation system to allocate costs from its various cost centers to IDCs. See id. para. (d)(1) (providing that costs "must be allocated between the intangible development area and the other areas or business activities on a reasonable basis"). While accepting petitioner's allocation system in many respects, the IRS determined that 100% of the costs captured in one important high-level cost center ("Technology and Content") must be allocated to IDCs. The result of this determination was to increase by $23 million and $109.9 million the cost sharing payments that AEHT was required to make in 2005 and 2006, respectively. Asserting that this determination was arbitrary and capricious, petitioner contends that only about half of Technology and Content costs should be allocated to IDCs.

The second question involves section 1.482-7(d)(2), Income Tax Regs., which requires that stock-based compensation be included in the IDC pool upon which cost sharing payments are based. Petitioner complied with this regulation in preparing its 2005-2006 tax returns; because the vast bulk of petitioner's stock-based compensation was paid to its domestic employees, the result was to increase accordingly the cost sharing payments required of AEHT. Our treatment of this issue is governed by the terms of the parties' cost sharing agreement, and in light

of our decision in Altera v. Commissioner, 145 T.C. 91 (2015), which invalidated the regulation in question.

FINDINGS OF FACT

Amazon.com, Inc. (ACI), is the common parent of a group of affiliated corporations that join in the filing of a consolidated return (Amazon US) and of numerous foreign subsidiaries (collectively, Amazon or petitioner). ACI was incorporated in 1994 in Washington and was reincorporated in 1996 in Delaware. It began operations in 1995 and completed an initial public offering of common stock in 1997. Its principal place of business when it filed the petition was in Seattle, Washington.[5]

Amazon is an online retailer. It does not have brick-and-mortar stores, but rather sells products exclusively through Amazon.com and related websites. Initially Amazon sold only books, but by 2000 it had expanded its offerings into many other product categories, including music, video, electronics, toys, software, video games, cameras, kitchen items, tools/hardware, and home/garden. Amazon

[5]The Court issued protective orders adopting procedures to protect petitioner's trade secrets and proprietary technology (collectively confidential information) during the pre-trial, trial, and post-trial phases of this case. The facts set forth in this Opinion have been adapted accordingly. All information included herein has been determined by the Court not to constitute "trade secrets or other confidential information" within the meaning of section 7461(b).

would identify unrelated product vendors; buy products from them; manage inventory and price the products; list the products for sale on Amazon.com; and ship the items to customers from its warehouses.

Amazon is committed to continuous growth in the number and variety of products it offers for sale. With a view to increasing selection further, Amazon in 2000 began allowing third parties to sell items on its websites. Amazon made available a set of eCommerce platforms, services, and tools that enabled third parties to list their own products and services for sale on Amazon.com and related websites. This branch of Amazon's business was called Marketplace. Through Marketplace, third-party merchants set their own prices for their products and services, which appeared alongside the products that Amazon itself sold. Amazon received commissions on these third-party sales and recorded the commission amounts (not the sale prices) as revenue.

Some third parties desired to use Amazon's technology but did not wish to sell their products on an Amazon-branded website. To meet this demand, Amazon built and operated eCommerce websites, custom made for a particular merchant, through which that merchant could make online sales of its products under its own brand name. This branch of Amazon's business was called Merchants.com or M.com. Whereas Marketplace retailers sold items on Amazon's websites, M.com

retailers sold items on their own branded websites, which were built by Amazon using the entire suite of eCommerce technology that ran Amazon's own websites. Although Amazon built websites for numerous customers, the most successful implementation of its M.com business was the website it built for Target Corp., which enabled Target to sell its retail products through Target.com.

Since its founding Amazon has committed itself to the "three pillars" of selection, price, and convenience. Under the selection pillar Amazon aims to offer its customers the widest possible selection by ensuring continuous growth in the number and variety of products offered. Under the price pillar Amazon endeavors to keep its prices as low as possible at all times. The convenience pillar encompasses a range of goals associated with improving the customer experience, including: (1) helping customers find what they seek as quickly as possible; (2) delivering to them as quickly and accurately as possible all items that they purchase; and (3) ensuring that potential customers have all information useful in making purchasing decisions, even if their initial decision is not to make a purchase.

I. Overview of Amazon's European Business

A. Initial Expansion Into Europe

In April 1998 Amazon acquired Bookpages, Ltd., an online bookstore in the UK, and Telebook, Inc., an online bookstore in Germany. Later that year Amazon

re-launched these websites under the respective domain names Amazon.co.uk and Amazon.de. In August 2000 Amazon launched its French business organically rather than by acquisition, adopting the domain name Amazon.fr. At the outset, Amazon.co.uk and Amazon.de offered only books; Amazon.fr offered books, music, and video products. During the tax years at issue, Germany, the UK, and France were the only European countries in which Amazon operated.

By 1999 Amazon.co.uk, Amazon.de, and Amazon.com had become the three most popular online retail domains in Europe. By 2005 Amazon's share of total online retail spending approached or exceeded double digits in Germany and the UK, while lagging in France. In each country, however, Internet retailing was a small fraction of the overall retail market segment. By one account, Internet sales in 2005 represented only 2.4%, 5.6%, and 1.1% respectively of total retail spending in Germany, the UK, and France.

Although all three nations were EU members, the manner in which Amazon operated its business in each country was in many respects local. A local country manager supervised a staff with responsibility for vendor and customer relationships, fulfillment, pricing, and financial management. Due to differing cultural preferences, retail traditions, and national regulations, the details of these opera-

tions--and the technology required to make them happen--often varied from country to country.

As of January 1, 2005, vendors and the terms on which they sold goods to Amazon differed in each country. Local Amazon employees in each country identified and recruited vendors; this recruitment process was intensely personal and could take years. For example, although Canon is a multinational corporation selling cameras throughout the world, each of Amazon's European subsidiaries had to negotiate separately with the Canon team in its country, and those Canon teams had distinct organizations, pricing policies, and sources of supply. Similar variations existed in the Marketplace program: Local teams speaking the local language identified and recruited prospective Marketplace sellers in each country. As of January 1, 2005, even the largest of Amazon's vendors and merchants transacted with its European subsidiaries at the local level, rather than transacting with Amazon on a global or pan-European basis.

Pricing in Europe was also local. Amazon endeavored to offer the best value for customers, which meant matching or beating local prices, both online and offline. But prevailing prices for a given item could vary considerably from country to country on account of such factors as: (1) unique local competitors and competitive environments; (2) different vendors with different pricing policies;

and (3) local laws and regulations that restricted pricing (e.g., by preventing discounting on books and other items). In order to match competitors' prices, each European subsidiary first had to determine which companies it would treat as competitors; this was a local decision because the markets were all different. Each subsidiary then sent teams of local employees to check prices by visiting competitors' stores.

Local factors also affected the fulfillment process, that is, the mechanics of preparing an order for shipment and effecting timely delivery to the customer. As of January 1, 2005, each European subsidiary filled orders from an in-country fulfillment center; if a French warehouse was short of an item, delivery could be delayed even if UK warehouses had ample supply. Amazon's UK and German fulfillment centers used a "buffer rebin sortation process" that was built independently in Europe; it had a fundamentally different design from that used in Amazon's U.S. and French fulfillment centers. Amazon's transportation costs and the speed, reliability, and accuracy of its shipping also varied because of local regulations and other economic factors in Germany, the UK, and France.

Surprisingly perhaps, customers' payment preferences also differed geographically. German customers, for example, used credit cards less frequently than customers in other countries. The German subsidiary thus had to build two

unique payment systems for use by its customers: "direct debit," which enabled it to deduct purchase amounts from customers' bank accounts; and "pay by invoice," which provided customers a bill along with their shipment. German customers were also prone to regard items as having been purchased "on approval" and to return items with which they were dissatisfied. This required the German subsidiary to create unique processes to deal with the high volume of returns, which could range up to 50% on certain items.

The idiosyncrasies of local markets tripped up many U.S. retailers seeking to expand into Europe. Best Buy failed in the UK, and Walmart failed in Germany. Amazon itself came close to failing in France; in the early 2000s the French subsidiary was Amazon's worst performing business. This led to a substantial downsizing in 2004, which required the company to file with French authorities a "social plan" by which it communicated its downsizing plan and the justification for it.

B. Original Structure of European Business

Beginning in 1999 and continuing into 2006, the German retail business was conducted by Amazon.de GmbH and its subsidiary, a disregarded entity for U.S. income tax purposes (Amazon Germany). See sec. 301.7701-3(b)(2), Proced. & Admin. Regs. Beginning in 2000 and continuing into 2006, the French retail

business was conducted by Amazon.fr Holdings SAS and its subsidiaries, which were likewise disregarded entities for U.S. income tax purposes (Amazon France). The UK retail business was conducted primarily by Amazon.co.uk Ltd. (Amazon UK). Collectively, we will refer to these entities as the European Subsidiaries. The European Subsidiaries were wholly owned by Amazon US.[6]

Until April 30, 2006, Amazon US was the inventory owner and seller of record for the European businesses. The European Subsidiaries provided services to Amazon US in operating those businesses; in Germany, these services included setting up a commissionaire arrangement, whereby Amazon Germany held itself out to customers as the retail seller for the benefit of Amazon US. The European Subsidiaries provided Amazon US with retail support, storage facilities, fulfillment, back-office support, and local financial management services.

Until April 30, 2006, Amazon US also operated petitioner's "international third party" or "international 3PS" businesses. The international 3PS businesses included: (1) the European activities of Marketplace, which allowed third parties to offer products for sale on Amazon's websites; (2) the European activities of

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[6]The consolidated group headed by ACI includes a bewildering array of subsidiaries. In an effort to reduce the alphabet-soup character of this Opinion, we will generally refrain from noting which particular domestic subsidiary does particular things unless it is material to the legal analysis.

M.com, whereby Amazon used its technology to build websites enabling European retailers to sell their products through their own domain names and URLs; and (3) "Syndicated Stores," essentially the converse of Marketplace, whereby Amazon used its technology to sell its own products through a European retailer's website. The European Subsidiaries provided various services to Amazon US in connection with the international 3PS businesses, including website development and design, marketing services, and certain commissionaire services.

Before April 30, 2006, Amazon US owned most of the intellectual property required to operate its European businesses, and it licensed this intellectual property to the European Subsidiaries. This intellectual property included the underlying website technology, all of which had been developed in the United States; all of the European customer information; and most of the marketing intangibles, including trademarks and domain names. In 1996, for example, Amazon US registered the "Amazon" trademark under Nice classes 9, 37, and 42 in an attempt to protect that mark throughout the EU. As explained more fully below, some of the trademarks and domain names used by the European Subsidiaries were titled in their respective names.

Unlike in the United States, where Amazon operated uniform retail websites serving a large geography with a large population, Amazon's retail business in

Europe had a siloed structure. Each European Subsidiary had a distinct website employing its own national language. Each European Subsidiary had its own fulfillment centers, often processing country-specific inventory, and a distinct universe of customers residing chiefly within its own borders.

This siloed structure resulted in inefficient operations, lack of coordination among the European businesses, and barriers to pan-European expansion. The European fulfillment centers had inventory management problems and were reaching their physical capacity. Unlike their U.S. counterparts, European fulfillment centers could not freely transfer inventory and could not offload volume from one center to another. The growth of the European business was also stressing Amazon's website technology: All website servers were in the United States, and increased website traffic exacerbated latency problems. ("Latency" refers to the speed with which a webpage loads; customers prefer faster speeds.)

Recognizing that serving European customers through poorly coordinated national silos was inefficient, Amazon during the early 2000s began to investigate creation of a centralized European headquarters. One goal of this process was to enhance customer experience by locating servers closer to customers, thus reducing website latency. Other goals were to place top managers in the same time zones as their customers; to standardize best practices for customer service, traffic

generation, pricing, and vendor acquisition; to increase efficiency by minimizing duplicative individual country costs; and to create a pan-European fulfillment infrastructure that would facilitate expansion into additional EU countries.

Tax issues, including applicable tax rates, also loomed large in Amazon's thinking. To avoid creating a U.S. permanent establishment, European personnel could not sign contracts or make ultimate business decisions on behalf of Amazon US within Europe. By establishing a European headquarters, Amazon could collect and remit value added tax (VAT) at a single rate in a single jurisdiction (the location of the seller), rather than at multiple rates in multiple jurisdictions (the locations of the buyers). And Amazon was quite aware that the effective marginal rate of corporate income tax was (or could be negotiated to be) significantly lower in certain EU member states--specifically, Luxembourg and Ireland--than it was in the United States.

C. "Project Goldcrest"

Amazon's management decided to establish a European headquarters and assigned its U.S. tax department the task of developing a tax-efficient strategy for doing this. It considered several locations for the European headquarters, including Ireland and Luxembourg, and eventually opted for the latter. Amazon representatives met with Luxembourg authorities, including Jean-Claude Juncker,

Luxembourg's then prime minister, to discuss the potential for Amazon to locate its European headquarters there.

In broad outline, Amazon's plan was to transfer from Amazon US to the Luxembourg headquarters affiliate all of the intangible assets required to operate the European website businesses; to continue using the European Subsidiaries as service companies earning a nominal rate of return; and to have the vast bulk of the income from Amazon's European businesses taxed in Luxembourg at a very low rate. In pursuit of the latter goal, Amazon successfully negotiated an advance tax agreement with the Government of Luxembourg. After the restructuring, the Luxembourg entity would function as the operational and administrative headquarters for the European businesses and own virtually all of the intangible assets required to operate those businesses.

Beginning in 2004 Amazon undertook a series of transactions, dubbed "Project Goldcrest," to implement this plan. ("Goldcrest" refers to Luxembourg's national bird.) These transactions were complex; they involved many steps and many entities. But the basic outline can be stated fairly succinctly. Amazon US formed AEHT, the Luxembourg headquarters entity that would serve as the holding company for all of the European businesses. AEHT elected to be treated as a corporation for U.S. income tax purposes from the date of its formation. See sec.

301.7701-3(c), Proced. & Admin. Regs. Underneath AEHT numerous subsidiaries were created (collectively, Amazon Luxembourg) to perform various functions essential to operation of the European businesses. These functions included holding title to the inventory sold in Europe, licensing Amazon's intellectual property, housing the servers, and maintaining call centers. Amazon Germany, Amazon UK, and Amazon France thereafter supplied to Amazon Luxembourg the same types of customer-related, fulfillment, and support services that they had previously furnished to Amazon US.

After forming Amazon Luxembourg, Amazon effected the restructuring by completing six related transactions: (1) the Cost Sharing Arrangement;[7] (2) the License Agreement For Preexisting Intellectual Property (License Agreement); (3) the Assignment Agreement For Preexisting Intellectual Property (Assignment Agreement); (4) the European Subsidiary Contribution; (5) the European Business Contribution, and (6) the Four-Party Agreement. These agreements may be summarized as follows:

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[7]The Cost Sharing Arrangement actually involved two successive agreements. In December 2004 Amazon US and AEHT entered into an "Agreement to Share Costs and Risks of Intangible Development" with a stated effective date of June 7, 2004. On January 11, 2005, Amazon US and AEHT entered into an "Amended and Restated Agreement to Share Costs and Risks of Intangible Development" with a stated effective date of January 1, 2005. We will generally use the term "Cost Sharing Arrangement" or "CSA" to refer to the latter.

1. Cost Sharing Arrangement

The Cost Sharing Arrangement (CSA) was intended to be a "qualified cost sharing arrangement" within the meaning of section 1.482-7(a)(1), Income Tax Regs. Through the License and Assignment Agreements (described more fully below), AEHT obtained access to pre-existing intangible property of Amazon US, referred to as "the Amazon Intellectual Property." Through the CSA, the parties agreed to share the costs of further "research, development, marketing, and other activities relating to * * * maintaining, improving, enhancing, or extending the Amazon Intellectual Property."

Through its participation in the CSA, AEHT would assist, by way of financial contribution only, in the ongoing development of technology required to operate the European websites and related activities. The CSA required the parties to determine "Aggregate Allocable Development Costs," which would then be allocated to the parties according to the ratio of benefits each was projected to derive from ongoing development. Basically, this meant that Amazon Luxembourg would pay Amazon US for its ratable share of subsequently incurred intangible development costs (IDCs).

2. License Agreement

On January 1, 2005, Amazon US and AEHT entered into the License Agreement with a stated effective date of January 1, 2005. Amazon US thereby granted AEHT the rights to use "Amazon Intellectual Property," defined to exclude the marketing intangibles covered by the Assignment Agreement. The property covered by the License Agreement related to Amazon's website technology. Under the License Agreement, AEHT agreed to make a buy-in payment for the website technology in the aggregate amount of $226,520,000, to be paid in installments during the seven-year period beginning in 2005 and ending in 2011.

3. Assignment Agreement

In July 2005 Amazon US and AEHT executed the Assignment Agreement. Amazon US thereby granted AEHT the rights to use Amazon Intellectual Property not covered by the License Agreement, namely, customer data and previously developed marketing intangibles including trademarks, trade names, website content, and domain names relating to the European business. Though stated to be effective as of January 1, 2005, the Assignment Agreement remained executory until the "Business Transfer Date," which was May 1, 2006. Under the Assignment Agreement, AEHT agreed to make a buy-in payment for the marketing in-

tangibles and customer data in the aggregate amount of $27,991,000, to be paid in installments during the six-year period beginning in 2006 and ending in 2011.

4. European Subsidiary Contribution

In February 2006 Amazon Luxembourg acquired all of the stock of the European Subsidiaries via tax-free reorganizations under section 368(a)(1)(D). The reorganizations were accomplished by ACI's transfer of the stock of the European Subsidiaries (valued at approximately $196 million in toto) to AEHT in exchange for AEHT stock and cash, immediately followed by each of the European Subsidiaries' electing to be disregarded as separate from their owner for U.S. tax purposes. Amazon Luxembourg thus became the ultimate owner of all of the European Subsidiaries' property and the ultimate employer of their employees. See sec. 301.7701-3(b)(2), Proced. & Admin. Regs.

5. European Business Contribution

In a series of transactions between April 7 and May 1, 2006, Amazon US transferred to Amazon Luxembourg, in a section 351 exchange for stock, various assets (other than intellectual property) required to operate the European businesses. These assets included inventory, accounts receivable/payable, vendor contracts, transportation/delivery contracts, "associates agreements," licenses from third parties, and service contracts. Amazon US concurrently terminated the prior

agreements whereby the European Subsidiaries had provided services to and licensed intellectual property from it.

6. Four-Party Agreement

Under the Four-Party Agreement, effective April 30, 2006, the European Subsidiaries assigned or licensed exclusively to AEHT certain intellectual property titled in their names. Before 2005 the European Subsidiaries procured protection for, and registered in their own names, certain trademarks and domain names deployed in Europe. In exchange for these assets AEHT paid in the aggregate about $5 million.

D. Life After Project Goldcrest

After April 30, 2006, Amazon Luxembourg reported, for U.S. tax purposes, all of the income and expenses connected with the European businesses. It entered into agreements with the European Subsidiaries whereby they provided it with certain fulfillment services, customer and merchant services, and support services within their respective territories; the European Subsidiaries were paid a cost-plus fee for these services. In May 2006 AEHT's Irish subsidiary constructed a facility with numerous servers that provided data storage and hosting services for the European businesses; it received a cost-plus fee for doing this.

Amazon Luxembourg was by no means a shell company. Beginning in May 2006 it played a meaningful role in expanding Amazon's existing business in Germany, the UK, and France and extending Amazon's reach elsewhere in Europe. From 2006 through 2013 AEHT launched 11 new product categories through its UK and German websites, including apparel/accessories, sports/outdoors, jewelry/watches, health/personal care, shoes/accessories, auto parts, groceries, and baby products. It launched 15 new product categories through its French website, including most of the preceding categories and some others. And it launched new website operations in Italy (Amazon.it) and Spain (Amazon.es). Amazon's European revenues grew very rapidly during this period.

The Luxembourg headquarters also played a nontrivial part in rolling out new technology--the European Fulfillment Network (EFN)--that implemented standardized and improved fulfillment operations across Europe. The software underlying EFN was developed in the United States by Amazon US after 2005. It addressed the problem of multiple websites with country-specific fulfillment centers located in multiple countries.

The EFN technology successfully converted a three-country silo structure into a network, leveraging AEHT's status as Amazon's single seller of record throughout Europe, which simplified the sharing and pooling of inventory. The

EFN technology enabled customers shopping on one national website to view inventory and acquire products housed in fulfillment centers located in other countries. Implementation of this technology significantly reduced the time that customers waited to receive products, reduced shipment costs, lowered product prices, and dramatically increased selection.

II. Retail and Technological Environment

A. Internet Retail Environment

Internet technology makes retailing a more competitive business than it used to be. The World Wide Web enables consumers to compare prices in real time and buy at the lowest price offered on multiple websites. The Internet makes consumers' costs of searching for a product virtually disappear and allows them to switch from one retailer to another by clicking a mouse. A theory called "stickiness" posits that a consumer usually will not switch to a competitor after a single bad experience on a particular site. But Amazon adopted as a guiding principle that "competition is literally one click away."

The price transparency associated with online retailing leads to lower sales margins, one factor that makes online retailing so competitive. During the last 20 years, innumerable online retailers have gone out of business or lost significant value; even today, online retail remains a small fraction of the total retail market

segment. Because of this competitive environment, constant innovation is essential to ensure survival. Technological failure damages profitability; a late delivery or damaged product may also alienate a customer permanently.

Innovative technology underlies every aspect of Amazon's retail business. It is integral to creating and managing the catalog, displaying items in the catalog to potential customers, conveying the look and feel of the websites, convincing a potential customer to buy an item, completing transactions, processing payments, packaging an item, shipping it to the customer, and preventing fraud. To continue to deliver on its promises, Amazon in the mid-2000s made massive investments to ensure a rapid pace of technological innovation. Respondent's principal valuation expert, Daniel J. Frisch, agreed that Amazon operated in a "highly competitive, rapidly changing industry" that "requires substantial innovation all the time." Respondent's technology expert, Edward Felten, noted that "Amazon's entire existence has been characterized by the challenges of innovating due to running into unexpected walls and growing so fast that the entire structure seems in danger of failure at any moment."

Amazon's software engineers, computer scientists, and management team focused on continuous innovation to provide easy-to-use functionality, rich web-site content, fast and reliable fulfillment, timely customer service, and a trusted

transactional environment. Amazon regularly launched software on a test basis, fully conscious of the need for further improvements; its software and website content often changed multiple times the same day. Amazon's software development process "leveraged the future": By building a piece of software quickly, Amazon incurred the risk that it would not be adaptable to future needs. By repeatedly choosing "the expedient path" over "the right path," Amazon built up "technical debt" that inheres in software with a relatively short useful life.

Amazon's need to innovate was driven by multiple factors. Perhaps the most important factor was the need to increase "scale." One of Amazon's early business goals was to "get big fast"; getting big fast meant adding customers, webpage views, vendors, and new products at an extremely rapid pace. Website technology by its nature is subject to scale limitations; if the website cannot "scale up" to meet the demands placed upon it, it will crash. Rapid technological innovation was required to overcome the scale challenges posed by rapid growth.

These challenges were especially pronounced during Amazon's peak holiday seasons, when webpage views, transactions consummated, and products packaged increased by 300% to 400% over nonpeak periods. Holiday periods stressed every aspect of Amazon's system, and each successive peak season entailed higher

volumes and thus greater scale challenges. Amazon risked system collapse if its technology could not scale up to these demands.

Amazon's engineers testified that they spent the 1998, 2003, 2004, and 2005 holiday seasons "in crisis mode." Although its website was available to the public 98% of the time during the fourth quarter of 2004, Amazon experienced outages during critical holiday periods that impaired customers' ability to browse and shop. These and other outages during 2004, which resulted in lost revenue approaching $130 million, jeopardized Amazon's relationships with retail customers and Marketplace merchants. Determined to address these scale challenges, Amazon made 24-7 website availability its chief company goal for 2005.

A related factor driving innovation was the need to reduce "latency." During the early 2000s Amazon's software architecture was built in a siloed fashion that required particular functions to "call" data from databases. As website traffic geometrically increased, more nanoseconds were required to call these data, causing webpages to load more slowly and respond less quickly to customer requests. Amazon believed that website latency frustrated customers, leading them to abandon the page they were viewing or leave Amazon's site altogether.

Another factor driving innovation was the need to protect customer data and prevent fraud. Computer hackers and other bad actors posed increasing security

risks through cyber-attacks of various kinds. After 2005 security became a major focus of investment for Amazon. It dedicated large teams of software engineers to create innovative security protocols designed to repel cyber-attacks, keep its web-site up, protect customer information, and maintain customer trust.

The advent of new technologies, such as smartphones, likewise propelled innovation. Smartphones enabled customers to view products and make purchases through mobile networks; younger customers were especially prone to doing this. An online retailer risked losing these customers if it did not meet their demands. Because the online retail environment was changing so rapidly, Amazon believed it impossible to anticipate technological advances more than three years away.

B. Evolution of Amazon's Website Architecture

In January 2005 Amazon knew that many components of its website architecture would not meet its long-term needs. Its engineers, who never lacked self-confidence, believed that they would succeed in meeting future challenges as they appeared. But they did not know how they would do this.

When Amazon.com was launched in 1995, its website ran on Obidos, a single monolithic application atop an Oracle database.[8] Its user interface code,

[8]In software engineering, a monolithic application describes a single-tiered software application in which the user interface and the data access code are

(continued...)

database connections, and business logic were heavily interdependent. As traffic to Amazon's website increased, it added more and more servers, called "onlines," each running a web server and an instance of the monolithic Obidos code.

The Obidos application was written in "catsubst," an arcane programming language that Amazon created. Significant engineering effort was required to perform even basic tasks. The manner in which Obidos was written made it difficult to identify "dependencies," i.e., instances in which specific parts of the code depended on specific other parts of the code. Since any change to the Obidos code might affect many applications, a team desiring to modify one application had to get input from multiple engineering groups. This became a cumbersome process.

Obidos was also subject to "death spirals." Until 2000, every Obidos process, no matter how short lived, created its own database connections by calling databases directly, without coordinating requests across the different onlines. When too many onlines were seeking the same database resources, error conditions called "timeouts" would occur. The Obidos process would then throw a fatal error and restart, creating new database connections without properly releasing the old ones. As database connections piled up, calls from other Obidos processes to

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[8](...continued)
combined into a single program from a single computer system or network.

the databases would time out, throwing more fatal errors. When these "death spirals" occurred, the affected website could become unavailable for an hour or more. As the number of Amazon's customers grew, such crashes became more common.

By 2002 Amazon had moved six services out of Obidos: By reducing the load on Obidos it was able to handle a higher volume of web traffic. Although Amazon's chief technology officer declared in 2005 that the Obidos architecture had reached its "end of life" in 2001, 98% of Amazon's retail webpages still ran on Obidos as of January 2005. By May of that year there was real concern that Amazon's website would not be able to scale through the holiday season if it continued to run on Obidos. Great effort was expended to move a significant amount of traffic off Obidos and onto a service-oriented architecture known as Gurupa. Amazon transitioned rapidly away from Obidos during 2005 and ceased using it altogether on August 31, 2006.

Amazon began its shift toward a service-oriented architecture around 2002. "Service-oriented architecture" describes software designed as a set of small, independent programs or "services"; the services work together to perform complex tasks. In this model, each service needs to understand how to interact only with those other functions with which it has actual contact. This differentiates it from a monolithic model, where each function must understand how to interact with

every other function in a larger program. Amazon did not invent service-oriented architecture, which was a well-known concept in the computer industry.

Amazon built this new architecture on a Gurupa engine, which received requests from a web server, sent the requests to services or applications, and returned responses to the web server. The engine did not create webpage content; instead, it sent requests to applications that, in coordination with services, created and returned webpage content to the server. The role of the Gurupa engine, in effect, was to stitch together dynamic webpages.

The transition from Obidos to Gurupa was an architectural shift from a monolithic to a distributed system and involved rewriting software in different programming languages. Amazon decided to abandon catsubst for building webpages and shifted to a programming language known as Perl and a templating language known as Mason (the duo was called "Perl/Mason"). Amazon could reuse very little of the Obidos software when it moved to Gurupa. And many concepts that underlay the monolithic architecture were not applicable to a distributed system. Amazon displayed its first Perl/Mason page in August 2005, but very few European webpages were generated using Perl/Mason and Gurupa until 2006.

Problems with the new architecture soon emerged. Webpages created in Perl/Mason and rendered using the Gurupa engine took longer to appear in a

user's browser than comparable Obidos pages. Gurupa's throughput--the number of webpages that could be displayed per second--was less than a tenth of Obidos' in August 2005. One reason was that Gurupa at the time did not support parallel rendering or "streaming." Rather than loading webpages sequentially, streaming enables different parts of a webpage to be loaded simultaneously, permitting the customer to view part of the page while the rest is being delivered to his or her web browser. Streaming capabilities were increasingly prevalent on Amazon's competitors' websites, and their absence at Amazon negatively affected its customers' shopping experience.

Another problem was that the services called by the Gurupa engine were developed in "silos" rather than as an integrated system. In certain situations, these services suffered from "circular dependencies," that is, links that eventually connect code back to itself, which can cause the software to crash after a code change. Because of lack of coordination between service "silos," code was often written that duplicated existing functionality. These structural problems increased as Amazon created new services and expanded its website capabilities.

Because the Gurupa architecture was a set of disconnected silos rather than a technology platform, many of Amazon's engineers regarded it as "dramatically unreliable from the first day." Amazon found it increasingly difficult to hire pro-

grammers eager to work in this environment: Typically trained in Java and C++, they came to regard Perl/Mason as a "dead language." In October 2009 Gurupa instances running the U.S. website were expected to crash with unacceptable frequency if not killed and restarted.

In September 2006 Amazon hired Brian Valentine to envision and lead the development of a new eCommerce platform. He regarded Gurupa as an unreliable application and put it on "life support" shortly after he arrived. He testified that his unit had to devote most of its efforts to "keeping the lights on"--that is, keeping Amazon's websites from crashing on Gurupa--rather than pursuing innovative projects. By 2012 Amazon had migrated most of its website platform from Gurupa to Santana, but it was still using Gurupa for some applications as late as November 2014.

Mr. Valentine's goal was to create a true technology platform, with a central and standardized set of services and a uniform interface for interacting with those services. A key feature of this platform was Santana, a Java-based web hosting service and rendering engine that addressed Gurupa's performance and stability problems. Santana was first deployed on an Amazon website in 2007; by 2008 Amazon had chosen Santana as its preferred architecture for future software development projects. This shift to Santana required Amazon to rewrite virtually all of

its eCommerce services, and the new platform thus took much longer to build and implement than Amazon had expected.

The new platform was vastly superior to its predecessor. Java was more efficient and performance oriented than Perl/Mason, and it was a modern programming language that made hiring easier. Java reduced the parallel rendering problem that had plagued Gurupa, and it significantly reduced latency. Java was superior for streaming digital content and, in conjunction with Santana, it provided much better throughput.

C. Evolution of Amazon's Software Applications

Corresponding to these major shifts in Amazon's software architecture, the applications or "services" that performed specific business functions underwent constant change. The shift to Santana required almost everything from Gurupa to be rewritten or thrown out. Representative examples are discussed below.

1. Customer Master Service

Launched around 2000, Customer Master Service (CMS) was the first service launched in Amazon's move toward a service-oriented architecture. CMS initially had limited ambitions, simply allowing customers to change their user names or passwords. As a result of constant revision its functionality was vastly expanded. CMS eventually functioned as a "broker" between the database storing

Amazon's customer information and the various retail segments (e.g., service centers, fulfillment centers, and the website) that needed this customer information.

By fall 2004 CMS had grown very large, complex, and fragile as Amazon's evolving business requirements necessitated constant changes to the software. CMS became a bottleneck and experienced more than 50 hours of outages during the December 2004 holiday season. To address these problems, Amazon embarked on a complete re-architecture of CMS during 2005 and 2006. At the time of trial, CMS no longer existed, having been replaced by new software known as Identity Service.

2. Order Master Service

"Ordering" includes the steps whereby a customer places an order, payment is authorized, a shipment request is prepared, and the order is handed off for fulfillment. This requires interactions with many other parts of Amazon's software, including the systems managing fraud prevention, payment, sales tax collection, and fulfillment. Amazon developed Order Master Service (OMS) around 2000 to handle key aspects of shopping carts, orders, shipments, and related business logic and messaging. Although it was built outside of Obidos, it resembled Obidos in being a large monolithic program that was difficult to support.

By spring 2004 OMS was causing bottlenecks that generated fatal errors in 1% of all customer sessions, frustrating customers and generating other problems. Amazon's engineers referred to OMS as "the new Obidos" because it "created long lead times for bug fixes and new features and needlessly tied together unrelated product launches." Amazon concluded that OMS needed to be substantially rewritten to simplify it and decouple it from the software handling payments, promotion, shopping cart, and fulfillment.

Beginning in 2006 Amazon's engineers "refactored" OMS into several different services.[9] The software was rewritten in a way that allowed multiple teams of programmers--e.g., those writing software for payments and sales tax collection--to work in parallel, thereby improving efficiency and avoiding time-consuming collaboration. By January 1, 2010, there was virtually nothing left of the OMS software that existed in 2005.

3. Dynamo

An important component of Amazon's ordering technology is its much-imitated "shopping cart," which allows customers to save items they intend to purchase in a single location while they continue to shop. Amazon initially stored

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[9]"Refactoring" means changing the internal structure of source code to improve its efficiency--e.g., by removing dead code and unwanted dependencies--without changing its essential function or external behavior.

shopping cart information in an Oracle database. By the end of 2004 Amazon's overloaded shopping carts were driving the Oracle databases to operate beyond the limits of their capability, causing multi-day outages in 2004. In early 2005 Amazon's shopping cart had "low availability," which meant that customers could put items in their carts, experience a session crash, and return to find their carts empty. During 2005-2006 Amazon's engineers developed a high-availability system called "Dynamo" to replace the Oracle databases. Dynamo was fully implemented during 2007 and lasted about five years before it needed to be replaced.

4. Payments

Amazon's Payments software manages and secures payment transactions with both retail customers and merchants. By late 2004 this software was experiencing stress. To keep Payments running during the 2004 holiday season, Amazon's engineers had to work around the clock, sleeping in hotels close to its data-centers so they could be available in the event of an emergency. By 2005, simply adding a new payment method required changing multiple services and consumed several months of an engineer's time. Amazon's engineers described the state of the Payments system as "pretty dire" in 2006, when slow transaction processing caused it to lose a significant amount of revenues. Concluding that small-scale revisions would not do the trick, Amazon decided (in the words of Distinguished

Engineer Vosshal) to "declare bankruptcy on Payments and just start over." The engineering team completely rewrote this software between 2006 and 2011, replacing all but "a few lines of code that may persist in the dark corners."

5. Item Master

Amazon stores information about products offered on its websites in databases referred to as "the catalog." In 2001 Amazon began developing software called Item Master as a single repository for product information. This software allowed Merchants and suppliers to add items to Amazon's catalog and maintain current, accurate descriptions of these products and their attributes.

Item Master went through three major revisions between 2001 and 2010. By 2004 the software (then in its second version) was encountering scale limitations and lacked functionality that Amazon's expanding business required. For example, Item Master was unable to identify situations where items listed by different sellers were in fact the same item; this damaged the customer experience by returning multiple search results in response to a query for a single product. To address these and other challenges, Amazon in 2006 began developing a third version of the software, Item Master v3. Item Master v3 rebuilt the process for listing and describing items in the catalog and entailed a substantial rewrite of

Item Master v2. Item Master v3 was deployed in 2007 and ran concurrently with Item Master v2 until 2010, when the latter was shut down.

6. Personalization

Amazon's personalization technology includes "Recommendations" and "Similarities." The "Recommendations" software tracks information about a customer and suggests products he or she might wish to buy on the basis of prior purchases. The "Similarities" software suggests items that resemble or are compatible with an item for which the customer is shopping (e.g., "customers who bought this item also bought item X," or "this item and Item Y are frequently bought together").

Personalization poses two sets of problems. One set involves the algorithmic (or mathematical) challenges posed by a constant effort to refine the accuracy of items suggested as "similar" or "recommended." The second set of problems involves scaling: As the number of customers, prior purchases, and products for sale grows geometrically, the number of links between these variables, and the data that must be searched to make "recommendations" and propose "similarities," grows almost exponentially.

As of January 2005, Amazon's Similarities software was scaling very poorly and faced significant challenges related to latency. The technology could not keep

up with the rapid growth of available data; as it took longer to update data, similarities could not be detected using the most recent data. This inability to scale reduced the technology's value.

During 2004-2005 Amazon tried to build a new Similarities engine with increased scaling capacity, but that effort failed. During 2005-2006, Amazon built and launched a third Similarities engine that engineers described as "a complete rethinking of the problem" and "a total game changer." By employing "vastly more efficient algorithms," the new Similarities engine achieved speeds 40 times faster than its predecessor's. It significantly reduced the time needed to assemble and update Similarities data.

Amazon's Recommendations software likewise faced algorithmic, scale, and latency challenges. Because Amazon did not know which customers would visit when, the software had to process large volumes of data very rapidly in real time. Its algorithms had to select from and account for a wide variety of inputs in determining exactly which items would be recommended; for example, a purchase of patio furniture years ago would not yield useful recommendations for a customer now shopping for a computer. In an effort to ameliorate latency problems, Amazon rewrote Recommendations between May 2005 and May 2006, reducing its 60,000 lines of code to fewer than 15,000 lines. This redesign significantly

improved performance. Because of "substantial changes across every major component" of the Personalization technology, Amazon's engineers estimated that the contribution of that software, as it existed in January 2005, was "no longer material" within six years.

7. Messaging

Once Amazon moved toward a service-oriented architecture, it required "messaging" software to enable the technological components underlying its website to communicate with each other in a unified way. In 2003 Amazon was using commercially available publish-subscribe (or "pub-sub") messaging software supplied by TIBCO, a third party. TIBCO's messaging service at the time was state-of-the-art, but it was being pushed to its limits by the uniquely heavy performance demands that Amazon was placing upon it.

During the 2003 holiday season, failures in the TIBCO messaging software caused outages that could last hours at a time. In early 2004 Amazon's engineers expressed concern that introduction of new services could bring down Amazon's website because of the problems associated with TIBCO messaging software. Cisco Systems, which supplied Amazon with routers and other networking equipment, informed the company that its routers, in conjunction with the TIBCO software, would not support the "scaling up" required for the 2004 holiday season.

In October 2004 Amazon stopped using TIBCO for its "biggest use cases." It then explored developing its own pub-sub software to overcome TIBCO's performance and scaling problems. Amazon ultimately created and deployed the Amazon Messaging Platform (AMP) in late 2007.

D. New Products and Services After January 1, 2005

Many Amazon products and services familiar to consumers today did not exist in January 2005. These included Kindle, Amazon Prime, the Fire smartphone, Fire TV, Amazon's digital music and video offerings, cloud computing, and cloud storage services. Though some of these products and services were in development during 2005, none generated revenues until later.

Kindle, Amazon's eBook reader, enables customers to view digital books, newspapers, magazines, and blogs directly on the device. Kindle was prototyped in May 2005 and launched in the United States in November 2007. In October 2009, AEHT launched Kindle 2, a subsequent version of the device, in France, Germany, and the UK.

Amazon Prime is a membership program that enables customers to receive free one-or two-day shipping and discounted overnight shipping along with other benefits. Amazon introduced Prime in the United States in 2005 and in Europe between 2007 and 2008. The Prime program required major changes to the tech-

nology used to operate Amazon's fulfillment centers, especially during peak shopping periods. Items destined for Prime customers had to be picked, sorted, packaged, and shipped in a different manner from other items in order to ensure the expedited delivery that Amazon promised.

Amazon introduced Amazon Unbox, a digital video download service, in September 2006, and it introduced Amazon MP3 in the United States in September 2007. AEHT launched MP3 in Europe the following year. Digital media has become an increasingly important part of Amazon's business.

Amazon Web Services (AWS), the company's cloud-computing business, was largely developed after January 2005. It was launched in the United States in 2006. It has grown significantly in terms of employee headcount, number of servers required to operate the business, and revenues generated.

III. Amazon's Third-Party Businesses

A. Merchants.com

In its M.com business, Amazon used the technology that powered its own retail websites to build and operate eCommerce websites for other merchants. Amazon's principal M.com clients were large retailers doing business in the United States and abroad; there were no material differences between the technology "packages" that domestic and foreign clients received. Amazon's major

clients included Target in the United States, Marks & Spencer in the UK, Mothercare in the UK, and Sears Canada. Amazon's contract with Target went into effect in 2001 and was initially set to expire in 2006; it was later extended several times via amendments. Amazon eventually decided to terminate the M.com program and shut it down altogether after 2010.

M.com retailers sold their own products on their own branded websites; the third-party retailer was the seller of record and owned all the inventory. Although Amazon built and operated these sites, it remained "behind the scenes" as far as the retailer's customers were concerned. The M.com sites employed the retailer's web address, URL, trade name, and trademarks; M.com clients had no right to use Amazon's marketing intangibles and received no information about Amazon's own retail customers.

The clients obtained, as part of the M.com "package," the complete suite of Amazon's website technology, including the customer service, fulfillment, and related software that Amazon itself used. M.com clients received all of the software updates and upgrades that benefited Amazon's own websites. There was no extra charge for these upgrades; they were included within the basic deal structure regardless of whether Amazon's contract with the client included an explicit "feature parity" clause.

For additional fees, M.com clients could also arrange to have Amazon perform certain services for them, using Amazon's own facilities. These services could include fulfillment, transportation, customer service, payment processing, fraud prevention, and/or marketing. Not all M.com clients chose to avail themselves of these additional services. In some cases Amazon agreed to develop for M.com clients (again for additional fees) specific technologies that Amazon did not use in its own business.

B. Associates and Syndicated Stores

Through the M.com program, Amazon functioned essentially as a supplier of technology to other retailers. Through the Associates and Syndicated Stores programs, Amazon entered into relationships with third parties with the goal of enhancing its own customer base. In both of the latter programs, Amazon paid referral fees to the third party when its customers or website visitors made purchases from Amazon. Both programs were in operation in 2005-2006; only the Associates program continues to operate today.

In the Associates program, the third party or "associate" includes on its own website a link to Amazon's site. When a visitor to the associate's website "clicks through" to Amazon and makes a purchase, the associate earns a referral fee. Associates could be online retailers themselves, but more typically they maintain

content-specific sites or blogs that offer product reviews or similar information. Some have as their principal goal capturing web traffic and linking their viewers to Amazon and other sellers in order to earn commissions. Generally speaking, the associate earns a commission on any purchase the customer makes from Amazon within 24 hours of "clicking through" to Amazon's site.

Through Syndicated Stores, Amazon used its eCommerce technology to sell Amazon products through a third-party retailer's website (called the "mirror site"). In this scenario Amazon was the merchant making the sale; it kept the associated retail markup and paid a referral fee to the Syndicated Stores partner. Although Amazon derived benefits from Syndicated Stores apart from customer referral--because the partner was usually a web retailer, the program eliminated some competition--the fees Amazon paid were essentially payments for customer referrals.

Notwithstanding their differences, petitioner viewed the Associates and Syndicated Stores programs similarly: The primary purpose of both was to drive customers to Amazon. It signed agreements with about 20 Syndicated Stores partners (including European partners) before discontinuing the program. Whereas these agreements were individually negotiated, agreements in the Associates program were not. The process by which an associate joined the program was sub-

stantially automated and the compensation terms were fixed and largely non-negotiable.

The stated commission rates under both programs depended on product mix and sales volumes. Commission rates generally ranged from 4% to 8% in the Associates program and from 4% to 6% in the Syndicated Stores program. Referral fees for Syndicated Stores partners generally had a per-unit cap; this meant that the effective commission rate could be lower than the nominal rate reflected in the contract. Amazon expected that most people referred to it under these programs would be converted into Amazon customers, on whose subsequent purchases no referral fees would be due. It was accordingly willing to pay relatively high up-front commissions for customer referrals. The average referral fee Amazon actually paid under the Associates and Syndicated Stores programs was approximately 5.9% of referred sales.[10]

IV. The Buy-In Payment

Petitioner knew that it had a duty to report the Project Goldcrest transactions on its Federal income tax returns. To assist it in discharging this responsi-

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[10]In July 2001 Amazon entered into a Syndicated Stores agreement with Waterstone's, a UK retailer. It provided for a 5% referral fee, which could increase to 6% if certain aggregate sales thresholds were met. This agreement had an unusual feature whereby Amazon would also pay Waterstone's a one-time bounty of £7 for new purchases by certain customers.

bility, it hired Deloitte LLP to calculate the required buy-in payment. In order to do this, Deloitte needed multi-year financial projections for the European business. Given the unpredictability of eCommerce revenue growth, Amazon for internal budgeting purposes did not make financial projections more than 12 or 18 months out. It assigned its tax department the task of creating longer term projections for this occasion.

The tax department started with Amazon's historical financial data and the most recent income-statement forecast, which included projections for the next 18 months. In consultation with business and finance personnel, the team forecast growth rates for revenue, gross margins, operating expenses, and operating margins for the U.S. and the European businesses. These projections covered calendar years 2005 through 2010.

In 2006 Deloitte supplied Amazon with a "Transfer Pricing Documentation Report" to calculate the required buy-in payment. Deloitte determined that the best method for calculating the buy-in price was "an unspecified income-based method." See sec. 1.482-4(a)(4), Income Tax Regs. Although the method Deloitte employed was not "specified" in the regulations, Deloitte regarded it as similar in many respects to the specified residual profit split method. See sec. 1.482-6, Income Tax Regs.

Deloitte determined that the intangible assets Amazon US transferred to AEHT had a seven-year useful life. Relying on Amazon's 2005-2010 projections (which Deloitte extrapolated to 2011), Deloitte determined the future income streams of AEHT reasonably attributable to these assets, then allocated those income streams between pre-existing and subsequently-developed intangible property. Deloitte determined that the appropriate buy-in price was $254.5 million, to be paid over a seven-year period commencing in 2005.

At trial petitioner supported its position with respect to the buy-in payment principally on the basis of the comparable uncontrolled transaction (CUT) method. See sec. 1.482-4(c), Income Tax Regs. It contended that each species of intangible property--the website technology, the marketing intangibles, and the European customer information--had to be valued separately. For each species of property, Amazon submitted expert reports that estimated the property's useful life and valued it on the basis of available CUTs.

Respondent contended that the best method for determining an arm's-length buy-in payment was the discounted cash flow (DCF) methodology employed by Dr. Frisch. In the event the Court rejects that methodology, respondent submitted expert reports that employed a CUT methodology. For each species of property,

respondent's experts supported values substantially higher than those determined by Amazon's experts.

For the website technology, petitioner's experts derived a CUT by reference to the prices Amazon charged its M.com clients for the technology needed to run those clients' eCommerce websites. Petitioner's expert John Wills testified as to his belief that Amazon offered these M.com customers its full suite of website technologies together with all necessary services. He opined that the M.com transactions thus furnished appropriate internal CUTs for the technology that Amazon US made available to AEHT.

Four of petitioner's other technology experts--Ken Birman and Lorenzo Alvisi, David Parkes, and Alan MacCormack--employed various approaches to ascertain the useful life of Amazon's website technology and the rate at which it would "ramp down" or decay in its utility. Applying these useful life conclusions to the pricing data derived from the M.com transactions, Dr. Wills concluded that the value of the website technology transferred by Amazon US to AEHT ranged between $117 million and $182 million.

Respondent's expert Harlow Higinbotham agreed that the CUT method could be used to value the pre-existing technology and that the M.com transactions supplied a reliable source of CUTs. However, he concluded that Amazon's web-

site technology had an indefinite useful life. On the basis of his useful life determinations, Dr. Higinbotham valued the website technology transferred by Amazon US to AEHT at $3.34 billion.

For the marketing intangibles, Robert Reilly (petitioner's expert) and David Haigh (respondent's expert) both used an external CUT methodology to determine an arm's-length buy-in price. In selecting their CUTs, both experts also relied on the same sources of public information. But the two experts came to disparate value determinations, chiefly because of very different conclusions as to the useful life of the transferred property and the proper royalty rate to apply over the property's useful life. Mr. Reilly concluded that the arm's-length value of the marketing intangibles ranged from $251 million to $312 million; Mr. Haigh determined a value of $3.13 billion for the same intangible property.

The customer information that Amazon US transferred to AEHT consisted of data about European retail customers who had transacted with the European Subsidiaries before May 1, 2006. These data included names, email addresses, phone numbers, purchasing history, and credit card information. Amazon viewed this customer information as having a short useful life: People change their phone numbers and email addresses often, and their buying habits change significantly

over time. For its Similarities software, Amazon uses only relatively recent data because it regards older data as having little or no value.

Given the relatively short useful life of the customer information, Amazon's experts regarded Amazon US as having in essence "referred" its European customers to AEHT, which then benefited from having a base of inherited customers when it began operations on May 1, 2006. Dr. Wills accordingly used as CUTs the referral fees that Amazon paid its business partners in the Associates and Syndicated Stores programs.

Two of petitioner's other experts--Wendy Moe and Robert Wentland--performed analyses that estimated future purchases by the referred European customers and the rate at which these individuals would convert to direct customers of AEHT. Using these estimates, Dr. Wills applied a referral fee of 5.9%--the average referral fee Amazon itself paid to its Associates and Syndicated Stores partners--for all purchases by customers deemed to arrive at AEHT's websites by referral. Dr. Wills assumed that AEHT would pay referral fees for only six years, and he discounted the resulting revenue stream at 18%. This generated a buy-in payment of $52 million for the customer information that Amazon US made available to AEHT. Dr. Wills determined that this value would rise to $66 million if AEHT paid referral fees for 10 years.

Dr. Higinbotham agreed that the commissions Amazon paid third parties for customer referrals supplied appropriate CUTs. However, he gave particular weight to Amazon's agreement with Waterstone's, a Syndicated Stores partner in the UK. It provided not only for referral fees ranging from 5% to 6%, but also for a one-time bounty of £7 for new purchases by certain customers. Using these parameters, Dr. Higinbotham valued the customer information at $215 million.

V. Cost Sharing Payments

The CSA required AEHT to make annual cost sharing payments to compensate Amazon US for ongoing intangible development costs (IDCs), to the extent those IDCs (as determined by a revenue ratio) benefited the Luxembourg headquarters. See sec. 1.482-7(a)(1), (d)(1), Income Tax Regs. Virtually all technological innovation occurred within Amazon US. Thus, the larger the volume of IDCs that Amazon US is treated as having incurred, the larger the cost sharing payments that AEHT was required to make.

The regulations define IDCs and provide that costs that contribute both to intangible development activity and to other business activities must be allocated "on a reasonable basis." See id. para. (d)(1). Petitioner's cost accounting system during 2005-2006 did not specifically segregate IDCs or R&D expenses from other operating costs. Petitioner therefore developed a formula and applied it to

allocate to IDCs a portion of the costs accumulated in various "cost centers" under its method of accounting.

"Cost centers" are accounting classifications that enable a business to manage and measure operating expenses. Petitioner tracked expenses in six high-level cost centers: (1) Cost of Sales, (2) Fulfillment, (3) Marketing, (4) Technology and Content (T&C), (5) General and Administrative (G&A), and (6) Other. Each of these high-level cost centers is a "rollup" of numerous subsidiary cost centers. For some calendar quarters, more than 200 individual cost centers, each recording a specific type of expense, "rolled up" into intermediate cost centers and ultimately into one of the six top-level cost centers. For example, cost center 7710, "Systems and Network Engineering," rolls up into C210 ("Product Development") and C250 ("Technology/External"). All costs accumulated in "Product Development" and "Technology/External" roll up into the T&C category.

The parties agree that none of the costs accumulated in the "Cost of Sales" and "Other" categories are allocable to IDCs. Respondent accepts petitioner's formula-based allocation to IDCs of costs accumulated in the "Fulfillment" and "Marketing" categories, and he accepts petitioner's decision to allocate G&A costs to IDCs on the basis of the IDC outcomes for the other five categories.

The parties' dispute focuses on the T&C category. Respondent contends that 100% of the costs accumulated in the T&C category constitute IDCs; as a corollary, this would produce a commensurate increase in the percentage of G&A costs allocable to IDCs. Petitioner urges that T&C costs must be allocated between IDCs and other activities "on a reasonable basis" and that its allocation formula accomplishes this result.

Broadly speaking, the costs accumulated in the T&C category include expenses related to technological development and website content. According to petitioner's SEC filings, its T&C category expenses "consist principally of payroll and related expenses for employees involved in research and development, including application development, editorial content, merchandising selection, systems and telecommunications support, and costs associated with the systems and telecommunications infrastructure." T&C costs included costs associated with acquired website content; payroll and related expenses for employees involved in research, website development, and telecommunications support; and payroll and related expenses for employees involved in category expansion (i.e., expanding Amazon's product offerings) and buying.

During 2005-2006 many employees whose time was captured in T&C cost centers engaged solely in intangible development activity; certain employees en-

gaged solely in other types of activity; and certain employees engaged in both. This diversity of tasks was reflected in their job classifications. All Amazon employees have job codes beginning with a capital letter, one of which is "T," which stands for "Technical." Most cost centers that rolled up into T&C have a mix of T-coded and non-T-coded workers. During the first quarter of 2006, for example, 35 T&C cost centers had no T-coded employees; 27 had all T-coded employees; and 69 had a mix. On average during 2005-2006, there were almost as many T&C cost centers with no T-coded employees (31.4 cost centers) as there were with all T-coded employees (31.9 cost centers).

The subsidiary cost centers that "rolled up" into T&C captured a significant volume of non-IDC personnel costs. The diversity of the employees' tasks, which is reflected in their annual performance evaluations,[11] is illustrated by these examples:

• Employees in cost center 5155 manage third-party digital content that is viewed on or downloaded from Amazon.com. Certain employees manage the "customer purchasing experience." Other employees spend time negotiating and

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[11]The performance evaluations show that certain employees whose time was captured in T&C cost centers engaged in substantial non-IDC activity. Relevant cost centers include 7334, New Product Development; 7823, Data Warehouse Development; 5355, Large Accounts Services Account Management; and 7402, Payments Platform.

managing the logistics of acquiring website content from third parties and determining how this website content will be displayed to Amazon's customers.

• Employees in cost center 5357 build and improve technology that helps sellers integrate their products into Amazon.com. Some employees spend significant time helping sellers list their products. This includes assisting sellers in filling out spreadsheets and directing their submissions to other Amazon staff members.

• Employees in cost center 7723 design, expand, and maintain Amazon's product catalog. Some write code to compile and display the catalog or to allow customers to place orders. Others engage in routine maintenance and make minor code adjustments to alter the manner in which website content is displayed.

Because petitioner's T&C cost centers, like its Fulfillment, Marketing, and G&A cost centers, captured both IDCs and other costs, it devised a complex, multi-step formula to allocate costs "between the intangible development area and the other areas or business activities." See sec. 1.482-7(d)(1), Income Tax Regs. The details of this formula have varied over time. The formula that petitioner urged at trial employed data derived from a PricewaterhouseCoopers (PwC) study that identified qualifying research activities for purposes of claiming section 41 research and experimentation (R&E) credits for 2005 and 2006.

Because Amazon's employees did not record time specifically to R&E activities, the PwC study relied heavily on employee surveys. Most employees in T&C cost centers, regardless of job code, were surveyed. Some employees outside of T&C cost centers were surveyed if petitioner believed they engaged in qualifying research.

In these surveys PwC asked employees to complete questionnaires on which they divided their time among 14 specified activities. Eight of these activities involved software development, from the initial "requirements" phase through deployment and testing, together with direct supervision and direct support of software development. The time devoted to these eight activities was deemed to yield qualifying R&E expenses for section 41 purposes. Time devoted to five types of activities--specifically, routine engineering, routine data collection, reverse engineering, human resources/training, and activities outside the United States--was deemed not to yield qualifying R&E expenses for section 41 purposes. The 14th category captured days when no work was done, such as vacation days, sick days, and holidays.

From these surveys, PwC derived estimates to allocate employee time to section 41 qualifying activities. For each surveyed employee, PwC computed a "qualified research expenditure" (QRE) percentage, reflecting the portion of that

person's time that was spent on qualified research. In the fourth quarter of 2006, for example, the average QRE percentage for employees in the 7000 series of cost centers (capturing costs related to technology development, maintenance, and management) was 61.15%. In that same quarter the average QRE percentage for employees in the 5000 series of cost centers (capturing costs related to business line management) was 53.41%. PwC used these percentages in determining the section 41 credit to which it believed Amazon was entitled.

Noting the similarity between section 41 qualified research expenditures and IDCs, Amazon employed the PwC survey data as a central component of its formula for allocating costs under section 1.482-7(d)(1), Income Tax Regs. Simplifying somewhat, petitioner's formula for allocating T&C category costs between IDCs and other activities proceeds in several steps. As the first step, petitioner eliminated from the T&C cost centers all costs captured in 26 general ledger accounts that petitioner determined to be unrelated to intangible development. The resulting sum may be called "modified T&C category costs."

As the second step, petitioner identified the employees within the T&C category who were likely to have engaged in intangible development. Assuming that only T-coded employees were likely to have done this, petitioner divided the number of such employees by the total number of employees in the T&C category.

This yielded what petitioner called the "T-ratio." Petitioner calculated a distinct T-ratio for the T&C category for each calendar quarter during 2005-2006.

The next step was to examine the QRE survey results. Petitioner adjusted the PwC data to reflect the fact that certain costs ineligible for the section 41 credit (e.g., costs attributable to reverse engineering and non-U.S. activities) may properly be includible in IDCs. Petitioner accordingly determined an "adjusted QRE percentage" for each person in the T&C category, representing the portion of that person's time spent on intangible development. Petitioner computed the arithmetic average of these "adjusted QRE percentages," which it called the "adjusted QRE ratio" or "A-ratio."[12] Petitioner then multiplied the T-ratio by the A-ratio to yield a "development ratio" for the T&C category. Finally, petitioner multiplied "modified T&C category costs" (as determined at step 1) by the "development ratio" to determine the dollar volume of T&C category costs properly allocable to IDCs. Petitioner made separate computations for each calendar quarter and summed these results to produce annual IDC figures for the T&C category.[13]

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[12]If there was no PwC survey data for a particular T&C cost center--e.g., because that cost center was recently created or because it was determined not to contribute to section 41 qualifying research--petitioner applied the average A-ratio for cost centers with available survey data.

[13]Petitioner employed a similar methodology to determine the percentage of

(continued...)

On its 2005 and 2006 Federal income tax returns, petitioner reported cost sharing payments from AEHT of $116,092,584 and $77,297,000, respectively. (These amounts were reported as reimbursed R&E expenses, thus reducing otherwise-allowable deductions.) The cost sharing payment for 2006 was determined using the PwC survey data as described previously. Because the PwC data were not available when petitioner filed its 2005 return, it initially used a different system to determine the 2005 cost sharing payment. It subsequently filed an affirmative claim for 2005, reporting a lower cost sharing payment computed under the methodology used for 2006. By this affirmative claim, petitioner sought to reduce the 2005 cost sharing payment by approximately $59 million, or almost 50%.

VI. Stock-Based Compensation

The CSA executed by Amazon US and AEHT defined IDCs to "include all direct and indirect costs (including Stock-Based Compensation Costs)" relating to intangible development. Specifically, IDCs were defined to include "compensation provided by a Party to its employees or independent contractors in the form of equity instruments, options to acquire stock, or rights with respect to * * * equity

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[13](...continued)
G&A category costs allocable to IDCs. Respondent does not object to the G&A methodology, except to the extent that it employs what respondent views as an unduly low allocation of IDCs to the T&C category.

instruments or stock options as defined in Treasury Regulation § 1.482-7(d)(2)(i) (as amended by T.D. 9088)." The parties further elected, pursuant to section 1.482-7(d)(2)(iii)(B), Income Tax Regs., to take into account "all stock-based compensation in the form of stock options in the same amount, and as of the same time, as the fair value of the stock options reflected as a charge against income in the audited financial statements of a Party." This election was made "without prejudice to the Party's right to challenge the validity of Treasury Regulation § 1.482-7(d)(2)."

In filing its 2005 and 2006 returns, petitioner thus complied with the regulation requiring that stock-based compensation be included in the IDC "cost pool" upon which cost sharing payments are determined. Like many technology companies, petitioner questioned the validity of this regulation. The CSA accordingly included a "clawback" provision that will apply in the event section 1.482-7(d)(2), Income Tax Regs., is

> held to be an invalid regulation by a final decision in a court of law with respect to pending litigation involving another taxpayer including a U.S. Supreme Court decision, U.S. Court of Appeals decision upon denial of a writ of certiorari or lapse of time for filing such writ, or a decision by a federal trial court upon lapse of time for filing a notice of appeal, or * * * [is] revised or withdrawn by the Treasury Department such that the costs of stock-based compensation are not required to be included as costs for qualified cost sharing arrangements.

In the event this regulation is ultimately invalidated or withdrawn, the CSA provides that "stock-based compensation shall not be included in the determination of * * * [IDCs] in any Year to which this Agreement applies." For any year in which stock-based compensation turns out to have been "improperly" included in IDCs, "the Cost Share shall be recomputed without the inclusion of stock-based compensation in * * * [IDCs]," and "the Cost Share less the Recomputed Cost Share shall be refunded * * * [to the proper party]." The CSA provides that any such refund shall be "treated as an adjustment to the Cost Share for the Year in which the Triggering Event occurs * * *, and to the extent that such adjustment exceeds the Cost Share, the adjustment shall be applied to subsequent Years until fully exhausted."

In Altera Corp. v. Commissioner, 145 T.C. 91 (2015), this Court invalidated section 1.482-7(d)(2), Income Tax Regs., the provision that requires stock-based compensation costs to be included in the IDC pool. Our decision in that case was appealed to the U.S. Court of Appeals for the Ninth Circuit on February 19, 2016. The case remains pending on appeal.

OPINION

Section 482 gives the Commissioner broad authority to allocate gross income and deductions among commonly controlled entities if he determines that it

is necessary "to prevent evasion of taxes or clearly to reflect the income." The purpose of section 482 is prevent artificial shifting of income by placing a controlled taxpayer on a tax parity with an uncontrolled taxpayer. Sec. 1.482-1(a)(1), Income Tax Regs. The statute empowers the Commissioner to determine the "true taxable income" of a controlled taxpayer by ascertaining the income it would have earned if it had dealt with unrelated parties at arm's length. See Commissioner v. First Sec. Bank, 405 U.S. 394, 400 (1972); Seagate Tech., Inc. & Consol. Subs. v. Commissioner, 102 T.C. 149, 163-164 (1994). "In determining the true taxable income, 'the standard to be applied in every case is that of a taxpayer dealing at arm's length with an uncontrolled taxpayer.'" Veritas, 133 T.C. at 317 (quoting section 1.482-1(b)(1), Income Tax Regs.).

The Commissioner has broad discretion in applying section 482, and we will uphold his determination unless the taxpayer shows it to be arbitrary, capricious, or unreasonable. Seagate Tech., 102 T.C. at 164; Sundstrand Corp. v. Commissioner, 96 T.C. 226, 353 (1991). Whether respondent has abused his discretion is a question of fact. Sundstrand Corp., 96 T.C. at 353-354; Am. Terrazzo Strip Co. v. Commissioner, 56 T.C. 961, 971 (1971).

In a series of transactions in 2005 and 2006, Amazon US transferred intangible property to AEHT. These transfers required AEHT to make an upfront buy-

in payment to compensate Amazon US for the value of the assets thus transferred. See sec. 1.482-7(a)(2), (g)(2), Income Tax Regs. Respondent urges that a DCF methodology, as implemented by Dr. Frisch, supplies the best method for determining an arm's-length buy-in payment, and that the required payment is $3.468 billion. The first question we must answer is whether respondent abused his discretion in making this determination. We conclude that he did.

I. Cost Sharing Background

We begin our analysis with the regulations in effect in 2005 when Amazon US and AEHT entered into the CSA. Where parties have entered into a qualified cost sharing arrangement (QCSA), they share the cost of developing intangible property. See id. para. (a)(1). When one participant (here, Amazon US) makes pre-existing intangible property available for purposes of research under a QCSA, that party is deemed to have transferred an interest in such property to the other participant. This requires the other participant (here, AEHT) to make a "buy-in payment" to the transferor. Id. para. (g)(1) and (2).

The required buy-in payment "is the arm's length charge for the use of the intangible" multiplied by the controlled participant's share of reasonably anticipated benefits. Id. subpara. (2). The best-method rule, set forth elsewhere in the regulations, "seeks the most reliable measure of an arm's-length result." Veritas,

133 T.C. at 327; see sec. 1.482-1(c)(1), Income Tax Regs. The regulations provide that an arm's-length charge must be determined under one of four methods: (1) the comparable uncontrolled transaction (CUT) method; (2) the "comparable profits" method; (3) the "profit split" method; or (4) an "unspecified" method. See sec. 1.482-1(c), Income Tax Regs. "[T]here is no strict priority of methods, and no method will invariably be considered to be more reliable than others." Veritas, 133 T.C. at 327; sec. 1.482-1(c)(1), Income Tax Regs.

The regulations make clear that the buy-in payment represents compensation solely for the use of pre-existing intangibles. Section 1.482-7(g)(2), Income Tax Regs., captioned "Pre-existing intangibles," states:

> If a controlled participant makes pre-existing intangible property in which it owns an interest available to other controlled participants for purposes of research in the intangible development area under a qualified cost sharing arrangement, then each such other controlled participant must make a buy-in payment to the owner. * * *

By definition, compensation for subsequently developed intangible property is not covered by the buy-in payment. Rather, it is covered by future cost sharing payments, whereby each QCSA participant pays its ratable share of ongoing IDCs.

As in effect during 2005-2006, the regulations provided that the Commissioner "shall not make allocations with respect to a qualified cost sharing arrangement" except in two respects. Id. para. (a)(2). Specifically, adjustments are per-

mitted only to ensure: (1) that an arm's-length buy-in payment is made for pre-existing intangible property and (2) that each participant pays its appropriate share of ongoing IDCs.

This Court interpreted and applied these cost sharing regulations in Veritas, supra. The taxpayer there, a domestic corporation (Veritas US), developed, manufactured, and sold throughout the world advanced storage-management software products. Pursuant to a QCSA executed in November 1999, Veritas US granted a European subsidiary (Veritas Ireland) the right to use pre-existing intangible property overseas. The assets thus transferred consisted of short-lived technology, including source code for software products to be sold outside the United States, as well as the right to use outside the United States trademarks, trade names, and service marks owned by Veritas US. Veritas Ireland made a buy-in payment of $118 million for use of these pre-existing intangibles.

The IRS challenged the buy-in payment and ultimately determined that the required buy-in payment was $1.675 billion. Veritas, 133 T.C. at 312. The Commissioner's expert, Dr. Hatch, "assumed that the preexisting intangibles ha[d] a perpetual useful life" and "characterized the CSA as 'akin' to a sale or geographic spinoff" of the U.S. parent's international business operations. Id. at 313. Dr. Hatch "rejected the comparable uncontrolled transaction method" and "employ[ed]

a discounted cashflow analysis"--specifically, "the income method"--to determine the requisite buy-in payment. Id. at 312, 313.

Dr. Hatch defined the buy-in payment as "the present value of royalty obligations" expected to be paid in perpetuity under arm's-length terms. Id. at 313. He did not value individually any of the specific intangible assets that Veritas US transferred to its Irish subsidiary. Instead, "he employed an 'aggregate' valuation approach" that proceeded in three steps. First, he estimated the arm's-length royalty that would be due after November 1999 "on a go-forward basis." Ibid. Second, he chose a discount rate to convert these estimated future royalty payments into November 1999 dollars. Third, he "calculated the buy-in payment as equal to the present value of the royalty payments estimated in step 1, discounted at the rate determined in step 2." Ibid. This produced a buy-in payment of $1.675 billion, which Dr. Hatch determined to be economically equivalent to "a 22.2 percent perpetual annual royalty." Ibid.

We held that the buy-in payment thus determined represented an abuse of discretion. Id. at 327. Although we found several deficiencies in Dr. Hatch's methodology, his core error was to value "short-lived intangibles * * * as if they have a perpetual life." Id. at 321. We found that Veritas US "was in a perpetual mode of innovation" and that the useful life of the pre-existing technology-related

intangibles was four years. Id. at 324, 336. We found that the useful life of the trademarks, brand names, and other marketing intangibles was seven years. Id. at 338. It was unreasonable, we concluded, for respondent to determine the buy-in payment by assuming that a third party, acting at arm's length, would pay royalties in perpetuity for use of these short-lived assets.

As we emphasized in Veritas, the cost sharing regulations "unequivocally require[] a buy-in payment to be made with respect to transfers of 'pre-existing intangible property.' No buy-in payment is required for subsequently developed intangibles." Id. at 323. By valuing "short-lived intangibles * * * as if they have a perpetual life," the Commissioner's buy-in computation improperly took into account the value of "intangibles that were subsequently developed rather than pre-existing." Id. at 321. We concluded in Veritas that reliable CUTs existed for each form of intangible property transferred pursuant to the QCSA and that, with certain adjustments, "the CUT method is the best method for determining the requisite buy-in payment." Id. at 339.

II. Respondent's Determination of the Buy-In Payment

In this case respondent's primary position as to the appropriate buy-in payment was set forth in the expert report of Dr. Frisch. Like Dr. Hatch in Veritas, Dr. Frisch rejected use of the CUT method and applied a DCF methodology to

determine AEHT's buy-in obligation. His valuation, like that of Dr. Hatch, proceeded in three main steps. First, he estimated the future cash flows of AEHT's European business. Second, he selected a discount rate to convert these estimated cash flows into 2005 dollars. Third, he calculated the buy-in payment as equal to the present value of the cash flows determined at step 1, discounted at the rate determined in step 2.

For step 1, Dr. Frisch started with the projections by Amazon's management of revenues, expenses, and operating income for the European business for calendar years 2005 through 2011.[14] For years after 2011 Dr. Frisch assumed that the revenues, expenses, and operating income of the European business would grow at 3.8% per year, the rate at which the EU economy as a whole was projected to grow.[15] With these assumptions, Dr. Frisch projected AEHT's operating income into the indefinite future.

Believing that future cash flows, rather than operating income, would yield the best estimate of an appropriate buy-in payment, Dr. Frisch made several ad-

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[14]We will refer to these seven-year figures as "projections by Amazon's management" even though the figures for 2011 were extrapolated by Deloitte.

[15]We find no fault with this assumption. As will be discussed later, various experts expressed divergent views as to how AEHT's growth rate should be calculated after 2011. Dr. Frisch's decision to drop down to the long-term projected growth rate of the European economy was conservative and reasonable.

justments to AEHT's projected operating income. First, he subtracted the cost sharing payments that AEHT was projected to make to Amazon US under the QCSA. Second, he added back expected depreciation because it involves no outlay of cash. Third, he subtracted AEHT's projected future capital expenditures. Finally, he made adjustments based on AEHT's projected working capital.

After estimating AEHT's future free cash flows, Dr. Frisch moved to step 2 of his analysis: selecting an appropriate discount rate. Generally speaking, the higher the discount rate, the lower the present value of future cash flows. For internal budgeting purposes, Amazon's treasury department employed a weighted average cost of capital (WACC) of 13%. Using market data, Dr. Frisch concluded that a discount rate of 18% was appropriate.

At step 3, Dr. Frisch discounted AEHT's future cash flows through 2024--i.e., for 20 years out--at 18%. He determined that the present value of these cash flows was $3.067 billion. He then computed a discounted "terminal value" of $399 million for post-2024 cash flows; this calculation was necessary because he assumed that the intangible property subject to the buy-in payment had a perpetual (he called it an "indeterminate") useful life. Finally, to isolate the future cash flows attributable to AEHT's intangible assets, Dr. Frisch subtracted the value of the tangible assets it owned as of year-end 2004, which he determined to be neg-

ative $1.8 million (representing a negative cash position). This yielded a buy-in payment of $3.468 billion ($3.067 billion + $399 million + $1.8 million = $3.468 billion).

One does not need a Ph.D. in economics to appreciate the essential similarity between the DCF methodology that Dr. Hatch employed in Veritas and the DCF methodology that Dr. Frisch employed here. Both assumed that the pre-existing intangibles transferred under the QCSA had a perpetual useful life; both determined the buy-in payment by valuing into perpetuity the cash flows supposedly attributable to these pre-existing intangibles; and both in effect treated the transfer of pre-existing intangibles as economically equivalent to the sale of an entire business. Respondent admitted as much on brief, urging that "Project Goldcrest transferred all cash flows relating to the European operation to AEHT in what was, as an economic matter, a transfer of the European Websites Business for the indefinite future."

By assuming a perpetual useful life, Dr. Frisch failed to restrict his valuation to the "pre-existing intangible property," sec. 1.482-7(g)(2), Income Tax Regs., that Amazon US actually transferred to AEHT in 2005. As explained in connection with petitioner's CUT methodology, see infra pp. 103-107, the website technology that Amazon US initially transferred to AEHT had a useful life of

about seven years. Thus, after decaying or "ramping down" in value over a seven-year period, Amazon's website technology as it existed in January 2005 would have had relatively little value left by year-end 2011. But approximately 58% of Dr. Frisch's proposed buy-in payment, or roughly $2 billion, is attributable to cash flows beginning in 2012 and continuing in perpetuity.[16]

Conversely, it is clear that Dr. Frisch, like Dr. Hatch, improperly included in the buy-in payment the value of "subsequently developed intangibles." Veritas, 133 T.C. at 323. Management's projections for the European business were based on the (extremely high) growth rates that Amazon had achieved in the past. Such growth rates could be sustained only through constant innovation, including innovations concerning products and services that did not yet exist in marketable form.[17] Projects that would contribute to high future growth rates, some of which were in early development as of January 2005, included the Kindle, Amazon

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[16]As explained more fully infra pp. 117-120, we do not conclude that the website technology transferred in January 2005 had become wholly worthless at year-end 2011. It continued to have some residual value; it could be used for research and as a springboard for developing replacement technology. We conclude that a "tail" of 3-1/2 years is appropriate to capture this residual value. But this residual value, when added to the initial seven-year value, does not come close to Dr. Frisch's $3.468 billion figure.

[17]Dr. Frisch admitted that he did not investigate the manner in which Amazon constructed its revenue projections, testifying that he "couldn't do a detailed analysis of what was in the projections in terms of individual product."

Prime, the Fire smartphone, Fire TV, digital music/video offerings, cloud computing and storage, and the EFN, which implemented standardized and improved fulfillment operations across Europe.

These new products and services, as well as the next generation of Amazon's website platform, would be created thanks to massive projected IDC investments by Amazon in years after 2004. But AEHT would have paid, via cost sharing, its ratable share of these future IDCs, and it would thus co-own these subsequently-developed intangibles. Because AEHT would pay for these assets via cost sharing, it was not required to pay for them through the upfront buy-in payment. As we held in Veritas, 133 T.C. at 323: "No buy-in payment is required for subsequently developed intangibles."

Dr. Frisch's DCF methodology resembles Dr. Hatch's in another respect: It is based in essence on an "akin to a sale" theory. See id. at 313, 316, 320-321. Dr. Frisch computes the buy-in payment not by valuing the specific intangible assets transferred under the CSA but by determining an enterprise value for Amazon's entire European business. He deems the pre-existing intangibles to have a value equal to AEHT's enterprise value, less its initial tangible assets. By employing an enterprise valuation, Dr. Frisch necessarily sweeps into his calculation assets that

were not transferred under the CSA and assets that were not compensable "intangibles" to begin with.

"[F]or the definition of an intangible," the cost sharing regulations in effect for 2005-2006 refer to the definition set forth in section 1.482-4(b), Income Tax Regs. See id. sec. 1.482-7(a)(2) (last sentence). This definition is essentially the same as that set forth in section 936(h)(3)(B). In both provisions, "intangible" is defined to include five enumerated categories of assets, each of which has "substantial value independent of the services of any individual." These include patents, inventions, copyrights, know-how, trademarks, trade names, and 20 other specified intangibles. Each definition also includes a sixth category, consisting of "other similar items" in the regulatory definition and "any similar item" in the statutory definition. The former elaborates slightly on the latter by stating that, "[f]or purposes of section 482, an item is considered similar to those * * * [enumerated] if it derives its value not from its physical attributes but from its intellectual content or other intangible properties." Sec. 1.482-4(b)(6), Income Tax Regs.

An enterprise valuation of a business includes many items of value that are not "intangibles" as defined above. These include workforce in place, going concern value, goodwill, and what trial witnesses described as "growth options" and corporate "resources" or "opportunities." Unlike the "intangibles" listed in the

statutory and regulatory definitions, these items cannot be bought and sold independently; they are an inseparable component of an enterprise's residual business value. These items often do not have "substantial value independent of the services of any individual." Sec. 936(h)(3)(B) (last clause); sec. 1.482-4(b), Income Tax Regs. And these contributors to value are not "similar" to the enumerated intangibles because they do not derive their value from their "intellectual content or other intangible properties." Sec. 1.482-4(b)(6), Income Tax Regs.[18] Thus, as we concluded in Veritas, there was for the tax years at issue "no explicit authorization" in the cost sharing regulations for "respondent's 'akin' to a sale theory or * * * [his] inclusion of workforce in place, goodwill, or going-concern value" in determining the buy-in payment for pre-existing intangibles. 133 T.C. at 316.[19]

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[18]This conclusion is supported by the regulations' history. See DHL Corp. v. Commissioner, 285 F.3d 1210 (9th Cir. 2002), aff'g in part, rev'g in part T.C. Memo. 1998-461; Austin v. Commissioner, 141 T.C. 551, 561 (2013) ("The history of a regulation may be helpful in resolving ambiguities in it."). In 1993 the IRS considered updating the 1968 transfer pricing regulations. Via temporary and proposed regulations, the Secretary requested comments specifically as to whether "the definition of intangible property * * * should be expanded to include items not normally considered to be items of intellectual property, such as work force in place, goodwill or going concern value." 58 Fed. Reg. 5312 (Jan. 21, 1993). After receiving numerous comments opposing such an expansion, the IRS decided not to change the definition of intangible property. See T.D. 8552, 1994-2 C.B. 93 (explaining that the revised regulations merely clarified the 1968 definition).

[19]Even if certain items discussed in the text were thought to constitute "in-

(continued...)

Respondent urges that Dr. Frisch's adoption of a business enterprise valuation is supported by the "aggregation" principle. Under the caption "Aggregation of transactions," the regulations in effect during 2006 provided that the combined effect of multiple transactions may be considered "if such transactions, taken as a whole, are so interrelated that consideration of multiple transactions is the most reliable means of determining the arm's length consideration for the controlled transactions." Sec. 1.482-1(f)(2)(i)(A), Income Tax Regs.

We rejected respondent's "aggregation" argument in Veritas, 133 T.C. at 321, and we likewise reject it here. The buy-in payment represents compensation for "pre-existing intangible property" owned by the transferor. Sec. 1.482-7(g)(2), Income Tax Regs. For at least two reasons, the type of "aggregation" proposed by respondent does not yield a reasonable means, much less the most reliable means, of determining an arm's-length buy-in payment. See id. sec. 1.482-1(f)(2)(i)(A).

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[19](...continued)
tangibles" for cost sharing purposes, they were not necessarily owned directly by Amazon US or covered by the CSA. The European Subsidiaries had been in business--in Germany and the UK, very successfully--for more than six years as of January 1, 2005. They had substantial assets apart from their tangible property, including workforce in place and going-concern value. AEHT inherited these values when it acquired the stock and assets of the European Subsidiaries pursuant to the European Subsidiary Contribution, the European Business Contribution, and the Four-Party Agreement. See supra pp. 25-26. AEHT was not required to compensate Amazon US for these assets via the buy-in payment.

First, Dr. Frisch's business-enterprise approach improperly aggregates pre-existing intangibles (which are subject to the buy-in payment) and subsequently developed intangibles (which are not). Second, his business-enterprise approach improperly aggregates compensable "intangibles" (such as software programs and trademarks) and residual business assets (such as workforce in place and growth options) that do not constitute "pre-existing intangible property" under the cost sharing regulations in effect during 2005-2006. See Veritas, 133 T.C. at 321-323; see also Guidant LLC v. Commissioner, 146 T.C. 60, 82-83 (2016).[20]

In a related vein, respondent defends Dr. Frisch's approach under the "realistic alternatives" principle. The regulations authorize the Commissioner to "consider the alternatives available to the taxpayer in determining whether the terms of

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[20]In 2011 the Secretary finalized new cost sharing regulations that replaced the 1995 regulations involved in this case. T.D. 9568, 2012-12 I.R.B. 499. Issued in temporary form in 2009 and effective (as relevant here) in January 2009, these new regulations replaced the buy-in payment with the concept of a "platform contribution transaction" (PCT). 74 Fed. Reg. 341-342 (Jan. 5, 2009). The preamble to the temporary regulations noted objections from commenters that the PCT "included elements such as workforce, goodwill or going concern value, or business opportunity, which in the commentators' view either do not constitute intangibles, or are not being transferred, and so, in the commentators' view, are not compensable." 74 Fed. Reg. 342. The Treasury Department replied by stating that the new regulations "do not limit platform contributions that must be compensated * * * to the transfer of intangibles defined in section 936(h)(3)(B)." Id. As we noted in Veritas, 133 T.C. at 315-316, 329-330, the 2009 regulations did not apply in that case, and they have no application to this case either.

the controlled transaction would be acceptable to an uncontrolled taxpayer faced with the same alternatives and operating under comparable circumstances." Sec. 1.482-1(f)(2)(ii)(A), Income Tax Regs. Respondent contends that Amazon US had a "realistic alternative" available to it, namely, continued ownership of all the intangibles in the United States. If dealing with an unrelated party, respondent urges, Amazon US would clearly have preferred this alternative to a cost sharing arrangement that would give a competitor access to its "crown jewels." Respondent asserts that Dr. Frisch's analysis captures the value of this "realistic alternative" by estimating the future cash flows of Amazon's entire European business.

We find this argument unpersuasive for many reasons, but it suffices to mention two. First, respondent's argument proves too much. Whenever related parties enter into a QCSA, they presumably have the "realistic alternative" of not entering into a QCSA. From this truism respondent concludes that the buy-in payment must be determined as if the parties had not elected cost sharing but had instead continued to operate the business as they had done previously. This would make the cost sharing election, which the regulations explicitly make available to taxpayers, altogether meaningless. See id. sec. 1.482-7(a)(3) (providing that a QCSA "produces results that are consistent with an arm's length result" provided that all requirements of the cost sharing regulations are satisfied).

Second, as we noted in Veritas, 133 T.C. at 321 n.29, the regulation enunciating the "realistic alternatives" principle also states that the IRS "will evaluate the results of a transaction as actually structured by the taxpayer unless its structure lacks economic substance." Sec. 1.482-1(f)(2)(ii)(A), Income Tax Regs. Thus, even where a realistic alternative exists, the Commissioner "will not restructure the transaction as if the alternative had been adopted by the taxpayer," so long as the taxpayer's actual structure has economic substance. Ibid.; see Claymont Invs., Inc. v. Commissioner, T.C. Memo. 2005-254, 90 T.C.M. (CCH) 462, 467 ("Finally, because the transaction had economic substance, section 1.482-1(f), Income Tax Regs., prohibits respondent from restructuring the terms as if his alternative had been adopted by petitioners.").

The transaction actually structured by Amazon US was a cost sharing arrangement, and respondent does not contend that this structure lacked economic substance. The regulations in effect during 2005-2006 unambiguously entitled Amazon US to enter into a QCSA; it cannot be deprived of this entitlement on the theory that it had the alternative of doing something else. Because Dr. Frisch did not limit his buy-in payment to the value of the pre-existing intangibles transferred

pursuant to the QCSA, his approach violated the cost sharing regulations and must be rejected for that reason.[21]

Characterizing Veritas as a highly fact-bound opinion, respondent attempts to distinguish it on several grounds. First, he contends that Dr. Frisch, unlike Dr. Hatch, "did not opine or assume that the transferred intangibles had a perpetual life." Rather, Dr. Frisch posited that the pre-existing intangibles had an "indefinite" useful life, in the sense that "their useful lives, and thus their value, are increasingly uncertain over time." Regardless of what adjective one employs, Dr. Frisch clearly valued the intangibles as if they would retain value forever, discounting 20 years' worth of cash flows and then computing a "terminal value." Dr. Frisch admitted on cross-examination that his methodology produced, in mathematical terms, precisely the outcome that would occur if one assumed a perpetual useful life.

Respondent seeks to minimize this error, noting that, after 20 years, Dr. Frisch's terminal value accounts for a small fraction of his $3.468 billion total. But most of the intangibles had a useful life much shorter than 20 years, and the

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[21]Dr. Frisch stated that his DCF valuation would be consistent with the approach of the 2011 cost sharing regulations, and respondent's "realistic alternatives" argument may represent an attempt to apply those regulations retroactively. Cf. Veritas, 133 T.C. at 315-316.

useful life of the technology-related intangibles was only seven years. See infra pp. 103-107. About 58% of Dr. Frisch's total value, or roughly $2 billion, is attributable to cash flows after 2011, when Amazon's underlying website technology, as it existed on January 1, 2005, was expected to have lost most of its value. This is not a de minimis error.

Second, respondent urges that Dr. Frisch, by subtracting AEHT's projected cost sharing payments, excluded cash flows attributable to "subsequently developed intangibles" and thus avoided the error committed by Dr. Hatch. See Veritas, 133 T.C. at 323. In effect, respondent says, this allowed AEHT to earn a return of 18% (the discount rate Dr. Frisch applied) on its share of the IDCs that created the subsequently developed intangibles. In respondent's view, an 18% rate of return was more than generous for a company like AEHT, which respondent views as a "cash box."

This argument is unpersuasive for at least two reasons. First, AEHT was not an empty cash box. The European Subsidiaries, of which AEHT became the parent, had been in business for approximately six years. They had a skilled workforce; they owned tangible and intangible assets; and they had goodwill and going-concern value. When making the European Subsidiary Contribution to

AEHT in May 2006, petitioner valued the European Subsidiaries at approximately $196 million.

Second, and more fundamentally, respondent's argument ignores the fact that AEHT, by making cost sharing payments, became a genuine co-owner of the subsequently developed intangibles that the IDCs financed. Under Dr. Frisch's approach, AEHT is allowed to subtract from its buy-in obligation an amount equal to the present value of its projected cost sharing payments, i.e, its discounted cost of acquiring the subsequently developed intangibles. But all future European business profits generated by those intangibles, in excess of that cost, would be allocated to Amazon US through the buy-in payment.

As respondent urges, the discounting process by which Dr. Frisch computes the buy-in payment would arguably afford AEHT a limited return on the investment represented by its share of the IDCs. But the regulations simply do not authorize such an artificial cap on the expected returns that AEHT could realize as co-owner of Amazon's future intangible assets. Under the regulations in effect during 2005-2006, the IRS may not make allocations with respect to a QCSA "except to the extent necessary to make each controlled participant's share * * * [of IDCs] equal to its share of reasonably anticipated benefits." Sec. 1.482-7(a)(2), Income Tax Regs. The corollary of this rule is that each QCSA participant can expect to

receive its proportionate share of the profit attributable to the future intangibles. See id. paras. (e)(2), (f)(3)(iii). For this purpose, it is immaterial whether the participant engages in actual technology development or simply makes cost sharing payments in cash. By allocating to Amazon US all of AEHT's future profits in excess of the discount rate, Dr. Frisch's approach is irreconcilable with the governing regulations.

If Veritas cannot be distinguished on the facts, respondent urges that it be overruled. He contends that the outcome in Veritas was dictated solely by fact finding, so that "any assertions made by the Court about governing law are dicta and not controlling." As the previous discussion has made clear, we do not agree with respondent's characterization of Veritas, and we decline his invitation to overrule that Opinion.[22]

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[22]Petitioner urges that Dr. Frisch made other errors that affect the reliability of his conclusions. For example, when subtracting AEHT's projected capital expenditures from its future cash flows, he neglected to exclude startup expenses for the Luxembourg headquarters and the Irish data center. According to petitioner, correction of this oversight would reduce Dr. Frisch's valuation by $400 million. Separately, when subtracting AEHT's projected cost sharing payments from its future cash flows, Dr. Frisch assumed that Amazon's IDCs would grow at an annual rate of only 5% after 2005. If Dr. Frisch had used the IDCs as calculated by Dr. Higinbotham, petitioner contends that the valuation would be reduced to $2.946 billion. Although these (and other) challenges to Dr. Frisch's report have force, we need not consider them in detail. Respondent's "business enterprise" approach to determining an arm's-length buy-in payment for pre-existing intan-

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III. Petitioner's Determination of the Buy-In Payment

Having concluded that respondent's primary valuation approach was arbitrary and capricious, we turn to an assessment of petitioner's methodology. Petitioner's experts applied the CUT method to determine an appropriate buy-in payment for all three species of intangible assets--website technology, marketing intangibles, and European customer information--that Amazon US made available to AEHT. Petitioner submits that the CUT method "is the best method for valuing the pre-existing intangibles."

The CUT method determines an arm's-length charge for a controlled transaction by reference to the amount charged in a comparable uncontrolled transaction. Sec. 1.482-4(c)(1), Income Tax Regs. If an uncontrolled transaction involves transfer of the same intangible under the same or substantially similar circumstances, the CUT method will generally yield the most reliable measure of the arm's-length result. Id. subpara. (2)(ii). If uncontrolled transactions involving the same intangible under the same or substantially similar circumstances cannot be

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[22](...continued)
gibles is flawed in its central premise because it is inconsistent with the pre-2009 cost sharing regulations. That being so, modifying the details of Dr. Frisch's implementation of that approach would not carry the day.

identified, uncontrolled transactions involving "comparable intangibles under comparable circumstances" may be used, but the results may be less reliable. Ibid.

In order for intangibles involved in controlled and uncontrolled transactions to be comparable, both intangibles must be "used in connection with similar products or processes within the same general industry or market" and must have "similar profit potential." Id. subdiv. (iii)(B)(1). In determining whether controlled and uncontrolled transactions are comparable, the regulations direct us to consider comparability with respect to the relevant property or services, functions, contract terms, risks, and prevailing economic conditions. Id. sec. 1.482-1(d)(1).

Respondent's and petitioner's experts agree that the CUT method may reliably be used to value separately the website technology, the marketing intangibles, and the customer information, though they disagree mightily about the outcomes that this method should produce. We conclude that the CUT method provides the best method for determining the fair market value of all three species of intangible property, but we do not wholly agree with the results reached by either party in implementing this approach. Because petitioner has failed to prove that its proposed valuation meets the arm's-length standard, the Court must determine for itself, with respect to each category of property, the required buy-in payment. See

Sundstrand Corp., 96 T.C. at 354; G.D. Searle & Co. v. Commissioner, 88 T.C. 252, 367 (1987).

A. Website Technology

Petitioner's expert Dr. Wills opined that the M.com transactions between Amazon and its clients provided reliable internal CUTs for the transaction by which Amazon US made its website technology available to AEHT. In its M.com business Amazon used the technology that powered its own websites to build and operate eCommerce websites for other merchants. Amazon's principal M.com clients were large retailers operating in the United States and abroad. There were no material differences between the technology "packages" that domestic and foreign clients received.

Dr. Wills analyzed the M.com agreements in an effort to determine the royalty rate that an unrelated party, acting at arm's length, would pay Amazon US for the right to use the website technology. He found that the M.com agreements were priced "holistically"; by this he meant that the "headline" commission rate stated in each agreement covered not only the website technology but also ancillary services that Amazon furnished to that particular client. To the extent these ancillary services were supplied in addition to the website technology, Dr. Wills concluded that an appropriate adjustment to the headline rate was warranted.

Dr. Wills adjusted the commission rates appearing in 12 M.com agreements to eliminate profit attributable to ancillary services. He thus derived royalty rates ranging from 1.4% to 4.4%, with a median of 3.3%. He concluded that AEHT would be entitled to a downward "volume adjustment" because M.com clients with the largest sales volumes paid a lower implied commission rate. Applying a volume adjustment, he came up with a reduced royalty rate ranging from 1.4% to 2.4%. He concluded that no further adjustments were needed to account for differences in geography or profit potential (respondent's experts accept this latter conclusion).

Dr. Wills then determined a useful life and a decay curve for Amazon's website technology by relying on the analyses of four of petitioner's technology experts, Drs. Birman and Alvisi, Parkes, and MacCormack. On the basis of their analyses, he concluded that the website technology had an average useful life of six years but that it would decline in value or "decay" quite rapidly during this period. For example, he concluded that during 2007 the average value of the technology would be 56.1% of its January 1, 2005, value, and that during 2009 its average value would be 24.8% of that initial value.

Dr. Wills multiplied his volume-adjusted royalty rates (ranging from 1.4% to 2.4%) by the decay percentage to generate final royalty rates for each year.

Thus, for example, the effective "high" royalty rate for 2007 was 1.35% (2.4% × .561) and the effective "low" royalty rate for 2007 was 0.79% (1.4% × .561). For years after 2010 he added a "tail" of 3-1/2 years, at a flat royalty rate, to account for any "continued presence of some base of code" after six years.

Dr. Wills applied these declining royalty rates to a revenue base equal to AEHT's projected annual revenue for 2005-2011 (extended through 2014 using a 50% declining balance method)[23] to generate an annual royalty obligation. He then discounted this stream of royalty payments at 18% (the same discount rate used by Dr. Frisch) to produce a lump-sum net present value. This generated a buy-in valuation for the website technology ranging between $117 and $182 million.

Respondent's expert Dr. Higinbotham agreed that the M.com transactions provided a reliable source of CUTs for valuing the website technology. For his royalty rate he used the 4% "headline" commission rate appearing in a pre-2005 M.com agreement between Amazon and Target. For his revenue base he used management projections of AEHT's revenues through 2011. For years after 2011

[23]Under a "50% declining balance" method, the growth rate is reduced by 50% each year until it reaches a "stable" growth rate.

he assumed significantly higher revenue growth than Drs. Wills and Frisch (who assumed that AEHT's revenues would grow at the rate of the EU economy).

Dr. Higinbotham applied a flat 4% royalty rate to these projected revenues for years 2005 through 2024, then added a "terminal value" reflecting royalty payments in perpetuity. Unlike Dr. Wills, he did not adjust the royalty rate to account for decay in the value of the website technology as it existed in January 2005.[24] Instead, he assumed that this loss in value would be reflected in the cost sharing payments that AEHT would make to secure replacement technology. He accordingly estimated Amazon's future IDCs and subtracted from AEHT's future royalty payments its projected cost sharing payments. He discounted this stream of future net royalty payments at 14% to produce a lump-sum present value of $3.3 billion as the buy-in payment.

While the parties' experts have adopted somewhat similar approaches, they disagree on four major inputs into the CUT valuation: (1) the proper royalty rate; (2) the proper useful life and decay curve for the website technology; (3) the revenue base to which the royalty should be applied; and (4) the appropriate discount rate. We discuss these issues in turn.

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[24]In his work for private-sector clients, Dr. Higinbotham has employed decay curves (similar to those used by petitioner's experts) when implementing valuations under the 1995 cost sharing regulations.

1. Royalty Rate

The parties have two major disputes concerning the royalty rate. The first involves selection of the appropriate base rate. The second involves the necessity of a downward adjustment for sales volume and (if necessary) its magnitude.

Dr. Higinbotham selected a base royalty rate of 4%, the headline commission rate appearing in a pre-2005 M.com agreement between Amazon and Target. Dr. Wills derived his royalty rate from 12 M.com agreements, including the Target agreement. He concluded that it was inappropriate to rely solely on the headline commission rates stated in these agreements because the deals had multiple revenue sources, including ancillary services.

Dr. Wills based the latter conclusion in part on the testimony of Charles Moore, who headed the M.com business during 2005 and 2006. Mr. Moore testified that Amazon did not always expect to earn a profit on the ancillary services standing alone; the headline rate was designed to ensure a reasonable profit on those services as well as compensate Amazon for use of its technology. He further testified that his business team used detailed financial spreadsheets called "deal decks" to analyze the overall economics of an M.com transaction.[25] Using the

[25]The "deal decks" are complex financial spreadsheets that Amazon used to evaluate and negotiate the M.com agreements. These spreadsheets contained reve-
(continued...)

"deal decks" to back out the revenues attributable to ancillary services, Dr. Wills derived a royalty rate range of 1.4% to 4.4%, with a median rate of 3.3%.

The parties agree that the Target arrangement is the most comparable M.com transaction for purposes of implementing the CUT approach. Target was the largest M.com retailer and the most comparable to AEHT in terms of sales volume. Target, like AEHT, had a broad product line and wide product selection. And Target was contractually entitled to receive from Amazon US all technology updates as they occurred. But the Target agreement was not comparable in one major respect: It included a variety of ancillary services, such as fulfillment and customer service, that Amazon US did not provide to AEHT.

Target and Amazon executed their original M.com agreement on August 31, 2001. Target thereby agreed to pay commissions, computed on revenues derived from its website sales, of 5% during 2001-2002, 4.5% during 2003, and 4% during 2004-2006. This agreement was amended twice before 2006 (once in August 2003 and again in August 2005); both amendments retained the 4% headline commission rate for 2004-2006. The agreement was amended a third time in July 2006, about 18 months after Amazon US and AEHT executed the CSA. This final

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[25](...continued)
nue projections over the term of each agreement, taking into account historical information and ex ante profit and loss projections.

amendment replaced the 4% rate with a tiered commission structure based on sales volumes; it also included a dollar cap on the amount of commissions that Target was required to pay.

We disagree with Dr. Higinbotham's exclusive reliance on the 4% headline rate set forth in the original Target agreement. He acknowledged on cross-examination that the "holistic" pricing of the M.com agreements posed an impediment to relying solely on the stated commission rate. And he conceded that the "deal decks" should be afforded more weight than he gave them in determining projected revenue flows. Thus, while Dr. Higinbotham properly considered the version of the Target agreement in effect when the CSA was executed, his analysis suffered from reliance on a headline rate that included pricing for ancillary services as well as website technology.

Dr. Wills sought guidance from the "deal decks" to address the latter problem. But no "deal decks" could be found for any version of the Target agreement except the July 2006 final amendment. Using the "deal deck" for the July 2006 amendment, Dr. Wills estimated that an appropriate royalty rate for the Target agreement, adjusted to back out ancillary service revenues, would be 2.05%. But the July 2006 amendment post-dated the CSA transaction by 18 months, and the parties understood that this amendment would reduce Target's payment obligation

as compared with the flat 4% commission structure prevailing on January 1, 2005. While ex post data of this sort may provide a reference point or sanity check, we think Dr. Wills gave the July 2006 amendment undue weight.

In short, while the Target arrangement theoretically offers the best comparable, it is imperfect in part because the documentary record is incomplete. See sec. 1.482-1(c)(2), Income Tax Regs. (directing attention to "the degree of comparability between the controlled transaction * * * and any uncontrolled comparables, and the quality of the data and assumptions used in the analysis"). Nonetheless, we find that the Target agreements do bracket the range of acceptable royalty rates. From the agreement in effect on January 1, 2005, we conclude that a royalty rate adjusted to back out ancillary service revenue should be meaningfully below 4%. And from the agreement in effect in July 2006, which was designed to reduce Target's commission obligation, we conclude the proper base royalty rate should be meaningfully above 2.05%.

Since the Target agreements provide an imperfect comparable, we expand our analysis to include the other M.com agreements. Dr. Higinbotham reviewed 15 M.com agreements; he noted that no agreement had a "headline" commission rate below 3% and concluded that these agreements yielded a royalty rate range of 3% to 5%. Analyzing the "holistic" pricing of the 12 M.com agreements with

"deal decks," Dr. Wills determined a royalty rate range of 1.4% to 4.4%, with a median rate of 3.3%.

Evaluating all the evidence, we conclude that an arm's-length base royalty rate for the website technology, before applying any volume adjustment, is 3.3%. We find this rate acceptable because it properly backs out revenues attributable to ancillary services; it is the median rate determined by Dr. Wills; it is within Dr. Higinbotham's range; and it is near the midpoint of the commission rates bracketed by the various Target agreements.

We next must decide whether to apply a downward "volume adjustment" to the 3.3% base royalty rate. Dr. Wills noted that the sales volumes expected to be generated by AEHT were "substantially larger" than the sales volumes generated by any of the 12 comparable M.com retailers, including Target. He found it "clear from even a casual inspection of the data that there is a negative correlation between the commission rate and the associated sales volume," noting Mr. Moore's testimony that "[v]olume impacted deal pricing pretty significantly." Dr. Higinbotham agreed that this "negative correlation" existed and that AEHT's projected sales volumes were substantially larger than the median sales volume of the 12 M.com retailers that Dr. Wills surveyed.

We believe that some volume adjustment is required. But we find that Dr. Wills erred in applying a volume adjustment as large as 200 basis points (e.g., reducing the royalty rate at the high end of his range from 4.4% to 2.4%). Dr. Wills initially attempted to quantify a "volume differential" using a statistical analysis, but he found this approach unreliable (e.g., because it yielded negative implied royalty rates in some cases). He then made a "judgment call" and estimated a 200-basis-point adjustment. He admitted that he had no authority for this particular estimate and that it was not "very scientific." We agree with that assessment.

Although we do not accept Dr. Wills' 200-basis-point adjustment, we concur in his view that Amazon's agreements with its largest M.com clients are the most logical places to look for evidence of what an appropriate volume adjustment might be. Those four clients were Target, Mothercare (a UK retailer specializing in baby products and toys), Marks & Spencer (a UK department store chain), and Sears Canada.

As of January 1, 2005, the Target agreement specified a flat commission rate of 4% on sales. No explicit volume adjustment was incorporated into that agreement until July 2006. The parties initially agreed, moreover, that the commission rate would remain at 4% for the period beginning January 1, 2004, and

ending on December 31, 2006. Since the volume of Target's website sales was expected to increase substantially during this three-year period, the Target agreement provides inconclusive support for a volume adjustment or its appropriate size.

The other three M.com agreements were executed after January 1, 2005. The Mothercare agreement specified a commission rate starting at 1% on the lowest tranche of website sales. This rate increased to 3.75% when annual sales hit a certain volume, then decreased to a flat rate of 3.0% when annual sales exceeded £80 million. Since AEHT's expected annual sales volumes were expected to be many times larger than this, the Mothercare agreement provides inconclusive support for a volume adjustment or its appropriate size.

Amazon's other two largest M.com clients were Sears Canada and Marks & Spencer. The Sears Canada agreement specified a base commission rate of 3%; this rate decreased to 2.5% when sales exceeded CAD $200 million and decreased again to 2.0% when sales exceeded CAD $500 million. The Marks & Spencer agreement specified a base commission rate of 3%; this rate decreased to 2.5% when sales exceeded £350 million.

Review of these four agreements confirms our conclusion that Dr. Wills' 200-basis-point downward adjustment is unwarranted. But the agreements do not

yield a mathematical formula for calculating a proper volume adjustment. Indeed, each agreement could conceivably be read to suggest a flat commission rate at the very large sales volumes that AEHT was expected to generate, which would imply at best a modest downward adjustment. Dr. Higinbotham agreed that a volume adjustment would not be illogical, while offering no opinion as to what an appropriate adjustment would be. Using our best judgment as applied to the evidence and testimony as a whole, we conclude that a 25-basis-point adjustment is appropriate. After application of that adjustment, we conclude that an arm's-length royalty rate payable by AEHT for the website technology made available under the CSA is 3.05% (3.30%-0.25%).

2. Useful Life and Decay Curve

The parties have three main disputes concerning the useful life and decay curve: (1) whether the useful life of the website technology should be a relatively short term of years, as petitioner argues, or indefinite, as respondent contends; (2) whether the Court should apply a decay curve to the website technology during its useful life and (if so) what the rate of decay should be; and (3) whether and how AEHT must compensate Amazon US for the research value of the website technology during an ensuing "tail" period. We address these issues in turn.

a. Useful Life

Dr. Wills determined that the website technology made available to AEHT had a useful life, on average, of six years. In reaching this conclusion, he relied mainly on the analyses of petitioner's principal technology experts, Drs. Birman and Alvisi, Parkes, and MacCormack. Dr. Wills considered those experts' analyses reasonable in light of his experience pricing technology intangibles for Silicon Valley clients.

Drs. Birman and Alvisi adopted a qualitative approach to this problem by considering the major technological improvements (as distinct from ordinary maintenance and routine extensions) that the website technology, as it existed in January 2005, would need in the near future. They identified eight looming issues that Amazon would be required to address, including messaging technology, scaling issues, shopping cart database outages, and problems with Dynamo, Obidos and Gurupa. Given the magnitude of these problems, Drs. Birman and Alvisi concluded that a reasonable useful life for the website technology was three to five years.

Dr. Parkes conducted a somewhat similar ex ante analysis and a more quantitative ex post analysis. In his ex ante analysis, he examined the challenges (in terms of scaling, code complexity, low-quality functionality, and other problems)

confronting eight major software components (Application Engine; Catalog; Merchandising; Search/Browse; Ordering; Payments/Fraud/Identity; Pricing; and Fulfillment) as of January 1, 2005. He examined the information compiled by Amazon's engineers as of that date to assess their likely expectations as to how long this software would last. He determined on the basis of this analysis that a useful life of two to five years could reasonably have been anticipated.

For his ex post analysis, Dr. Parkes evaluated the degree to which the eight software components listed above were actually modified over time. For each year after 2005, he assigned to each component a rating of 1, 2, 3, or 4, depending on whether it remained essentially the same as in January 2005, had source code in development that would replace it, had been substantially modified, or had been replaced altogether. On the basis of this numerical rating system, Dr. Parkes opined that any "meaningful contribution" of Amazon's January 2005 website technology had disappeared after six years.

Dr. MacCormack performed a quantitative ex post analysis that examined actual changes to source code. He employed two metrics--component changes and architectural or "dependency" changes--to measure the relative contribution of the original source code (i.e., source code in existence in January 2005) for each year through 2013. Component changes measured the share that the original source

code represented of operative source code at later dates. Architectural changes, an alternative measure of software evolution, captured the extent to which "dependencies" among source files changed over time. On the basis of this quantitative analysis, Dr. MacCormack concluded that a useful life of six years or less was reasonable, noting that "a substantial portion" of the source code remaining after six years was "dormant or commoditized."[26]

The conclusions of petitioner's technology experts were generally consistent with the testimony of its software engineers. Brad Porter, a Distinguished Engineer, explained that Amazon built software "very, very quickly, very quick and dirty and expected to just throw things away after a couple of years and rebuild." Amazon's software development process "leveraged the future." By building a piece of software quickly, Amazon chose "the expedient path" over "the right path" and built up "technical debt" that inhered in software with a relatively short useful life.

Amazon's website architecture was undergoing rapid change as of January 2005. It had become clear that Obidos, the original monolithic architecture, would

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[26]Dr. MacCormack employed a variety of "robustness" checks to confirm his conclusion, including an analysis of actual changes to Amazon's source code between 2000 and 2005. This ex ante analysis, like his ex post analysis, focused both on component changes and architectural changes. Dr. MacCormack's ex ante analysis yielded decay curves resembling those generated by his ex post data.

not last much longer given the "scaling" demands that Amazon faced. Amazon attempted to solve these problems by gradually shifting work off Obidos and moving to a distributed system called Gurupa. By January 2005 the move to Gurupa was well underway, yet Obidos was not completely shut down until August 31, 2006. Gurupa was plagued by latency issues; by 2012 Amazon had migrated most of its website platform from Gurupa to Santana, but it was still using Gurupa for some applications as late as November 2014. The evolution of Amazon's website architecture thus reveals a pattern of continuity amid change: Elements of Obidos and Gurupa each persisted for nine years or more while Amazon was transitioning to its new platform.

The software applications or "services" that Obidos, Gurupa, and Santana called likewise went through major changes after January 2005. The key services that Amazon needed to run its website--Customer Master Service, Order Master Service, Dynamo, Payments, and Personalization--were all rewritten and replaced during 2004-2010. See supra pp. 38-45. The software underlying these individual services had a useful life ranging from three to eight years.

In sum, the evidence clearly establishes that Amazon's website technology did not have a perpetual or "indefinite" useful life, and we reject respondent's contention that it did. Dr. Wills' estimate of a six-year useful life comes close to

the mark, but we think his estimate gives insufficient weight to the persistence of Obidos and Gurupa architectural elements, some of which survived nine years or more. Using our best judgment as applied to the evidence and testimony as a whole, we conclude that Amazon's website technology--ignoring the "tail" discussed more fully below--had on average a useful life of seven years.

b. Decay Curve

Dr. Wills used decay curves prepared by Drs. Parkes and MacCormack to "ramp down," over the useful life of the website technology, the royalty rate that AEHT would be required to pay. Petitioner contends that this "ramp down" is necessary to correlate the buy-in payment to the value of the pre-existing intangibles. The website technology in existence in January 2005 gradually declined in value as major components were modified or replaced, and AEHT paid for the replacement technology with ongoing cost sharing payments. We agree that an uncontrolled taxpayer in AEHT's position would insist that its royalty payments decline ratably with the decline in value of the original technology.

Respondent first contends that no "ramp down" at all is required, noting that "[n]one of the M.com agreements had declining royalties based on obsolescence of licensed technology." That observation is correct, but immaterial. All of Amazon's M.com clients received technology updates for free; they paid a constant

royalty rate for the package of pre-existing and subsequently developed intangibles. AEHT, by contrast, did not receive technology updates for free, but made cost sharing payments by which it became a co-owner of the subsequently developed intangibles.

Unless AEHT's royalty rate were ramped down to reflect decay in the value of the original technology, AEHT would be required to pay for the subsequently developed intangibles twice, once through cost sharing and again through an artificially inflated buy-in payment. This would violate the cost sharing regulations. See sec. 1.482-7(g), Income Tax Regs. We accordingly conclude here, as we did in Veritas, that "an adjustment must be made to the starting royalty rate to account for the static nature of the [original] technology." Veritas, 133 T.C. at 337 (concluding that royalty rates "must be ramped down * * * at a rate of 33 percent per year" from prior-year royalty rate).[27]

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[27]In Veritas we derived the royalty rate ramp down from the taxpayer's "other agreements involving static technology," 133 T.C. at 337, rather than from the source code analysis performed by the taxpayer's expert, which we found "simplistic and mechanical," id. n.44. On this point the instant case differs from Veritas in two respects. None of the M.com agreements used as comparables here provided for a ramp down of the royalty rate, since each client received all technology updates for free. In the absence of such evidence, we necessarily rely on an analysis of the technology. And in this case highly qualified experts for each side performed source code analyses that were comprehensive, sophisticated, and nuanced.

Dr. Parkes derived a ramp down or "decay" curve by applying his 1/2/3/4 coding analysis to eight key software components. See supra p. 104. He concluded that, within six years of the CSA transfer date, any "meaningful contribution" of Amazon's pre-existing website technology had disappeared. He developed the following decay curve:

Year	Decay (percent)
2005	100
2006	76.4
2007	55.3
2008	37.5
2009	24.3
2010	10.6
2011	2.9
2012	2.9
2013	2.9
2014	2.9

Dr. MacCormack derived his decay curves by examining changes to source code. See supra pp. 104-105. For both of his metrics (component changes and architectural or "dependency" changes), he performed a "relative contribution" analysis. The premise of this approach can be illustrated by a simple example.

Suppose that 1,000 lines of code existed in January 2005; that 500 of those lines still existed in January 2010; and that 1,000 new lines of code had been written in the interim. Dr. MacCormack would find that the "relative contribution" of the original source code, as of January 2010, was 33% (500 ÷ 1,500). Employing this analysis on an ex post basis to actual code changes from 2005 through 2013, Dr. MacCormack calculated the following decay curves:

Year	Component (percent)	Dependency (percent)
2005	100.0	100.0
2006	50.2	57.1
2007	32.0	33.8
2008	25.5	28.8
2009	19.3	18.8
2010	12.9	14.3
2011	11.2	10.0
2012	9.4	7.9
2013	7.0	5.8

Dr. MacCormack then performed a "robustness check" that examined code changes between 2000 and 2005 and applied the results to 2005-2013. See supra note 26. This yielded decay curves as follows:[28]

Year	Component (percent)	Dependency (percent)
2005	100.0	100.0
2006	62.8	53.0
2007	39.4	28.0
2008	24.7	14.8
2009	15.5	7.9
2010	9.7	4.2
2011	6.1	2.2
2012	3.8	1.2
2013	2.4	0.6

Dr. Wills examined the decay curves prepared by Drs. Parkes and MacCormack. Reasonably adopting a conservative approach, he accepted for each year

[28]Dr. MacCormack reasonably decided, for two reasons, not to base his conclusions solely on ex ante data. First, during 2002-2005 Amazon was migrating from one code repository to another; because of the risk of overlapping or missing files during this period, Dr. MacCormack believed that ex post data were more reliable because that migration had been completed. Second, because Amazon's software was undergoing "significant architectural change" during 2002-2005, owing to the shift from Obidos to Gurupa, Dr. MacCormack found that "there was no guarantee that the pace and nature of Amazon's software evolution observed in years prior to 2005 could be used to project into the future."

the decay percentage that revealed the slowest rate of change from the previous year. Dr. Wills accordingly derived the following decay curve:[29]

Year	Decay (percent)
2005	100.0
2006	76.4
2007	55.3
2008	37.5
2009	24.3
2010	12.9
2011	11.2

Assuming arguendo that some "ramp down" is appropriate, respondent challenges Dr. Wills' decay curve principally by disputing the methodology that Dr. MacCormack used to measure changes to source code. Whereas Dr. MacCormack

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[29]Dr. Wills made two modifications to the decay curve shown in the text. He first adjusted the curve to reflect a "gestation lag" of six months to account for new technology that may have been partially developed during a prior period. Although no other technology expert included a "gestation lag," he believed that a six-month lag was reasonable on the basis of his experience. In the absence of technical support for a six-month "gestation lag" and any consensus that it is necessary, we will not adopt this modification. Second, Dr. Wills extended the initial period on his chart to end on April 30, 2006, rather than December 31, 2005, to reflect the fact that the former was the "business transfer date." This had the effect of reducing the decay percentage for the initial period from 100% to 90.4%. Because no other expert made this adjustment, and because we find no justification or need for it, we will not adopt this modification either.

employed a "relative contribution" approach in evaluating changes to source code, Geoff Cohen, one of respondent's experts, adopted a "persistence" approach. Source code "persistence" measures the extent to which source code existing in year 1 continues to exist, or "persist," in subsequent years.

The difference between the "relative contribution" and "persistence" approaches may be illustrated by the example used previously. Suppose that 1,000 lines of code existed in January 2005; that 500 of those lines still existed in January 2010; and that 1,000 new lines of code had been written in the interim. Dr. MacCormack would find that the "relative contribution" of the original source code, as of January 2010, was 33% (500 ÷ 1,500). By contrast, Dr. Cohen would find that the "persistence" of the original source code, as of January 2010, was 50% (500 ÷ 1,000). It can be seen that the essential difference between these approaches concerns the denominator of the fraction.

Predictably, Dr. Cohen's "persistence" analysis yielded much slower rates of decay than the "relative contribution" analyses of petitioner's experts. Dr. Cohen determined, for example, that more than half of Amazon's source code in development or deployed in January 2005 was still deployed in January 2013, and that 36% of the dependencies that Dr. MacCormack identified as of January 2005 still existed in January 2013.

We reject Dr. Cohen's "persistence" approach for the same reason that we have rejected other aspects of respondent's valuation: It fails to eliminate from the buy-in payment the value of subsequently developed intangibles. In terms of lines of code, Amazon's code base grew by about 400% from January 2005 to January 2011, representing an annual growth rate between 23% and 28%. New code and new technologies accounted for 93% of the code base by 2012, and AEHT paid for this new technology through cost sharing payments. In determining the extent to which the January 2005 technology had decayed in value, the relevant question is the extent to which that original technology contributed to the "stock" of technology required to operate AEHT's websites in each subsequent year.

Petitioner's experts answer that question correctly, under their "relative contribution" analysis, by using as the denominator of each fraction the code base existing in each subsequent year. By using as the denominator of each fraction the historical code base existing in January 2005, respondent's "persistence" approach substantially understates the true rate of decay and in effect requires AEHT to pay for the subsequently developed intangibles twice, once via cost sharing and again through an artificially inflated buy-in payment. This violates the cost sharing regulations. See sec. 1.482-7(g), Income Tax Regs.

Respondent raises a second challenge to petitioner's decay curve, which again focuses on the denominator of the fraction. Dr. MacCormack included in his denominators every line of source code existing on the relevant date, including files that may have been generated automatically by a computer (such as "XML," "arff," and other file extensions). Dr. MacCormack's denominators also included files relating principally to presentation of webpage content (such as "html" and "xsl").

Dr. Cohen opined that the lines of code thus produced should be eliminated from the denominator. A single computer-generated file can have tens of thousands of lines, many of which contain only data as opposed to meaningful instructions. In Dr. Cohen's view, it is inappropriate to equate these lines of code, for measurement purposes, to lines of code written by a programmer or software engineer. Dr. Cohen noted that code written to generate presentation content concerns the "look and feel" of the website as opposed to its functional operation. Because these lines of code are typically written by "painters" rather than "plumbers," he opined that they should likewise be excluded from the denominators.

We agree with Dr. Cohen on both counts. On the basis of his critique, Dr. Cohen recalculated Dr. MacCormack's "relative contribution" percentages by

eliminating from the denominators the lines of code described above. This generated modified versions of Dr. MacCormack's decay curves, as follows:

Year	MacCormack's original component (percent)	Modified component (percent)
2005	100.0	100.0
2006	50.2	65.5
2007	32.0	45.4
2008	25.5	36.5
2009	19.3	29.2
2010	12.9	26.2
2011	11.2	17.7
2012	9.4	14.3
2013	7.0	11.6

In sum, we agree with petitioner that the royalty rate for the website technology must be ramped down over its seven-year useful life on a decay curve. We also agree with Dr. Wills in accepting for each year, from among the decay curves the experts have supplied, the decay percentage that reveals the slowest rate of change from the previous year. However, we will substitute for Dr. MacCormack's original decay curves the modified curves, set forth in the previous paragraph, reflecting Dr. Cohen's critique. Applying Dr. Wills' approach to the

available decay curves as thus modified, we calculate, for the seven-year useful life of the website technology, ramped-down royalty rates as follows:

Year	Decay curve (percent)	Royalty rate (percent)
2005	100	3.05
2006	76.4	2.33
2007	55.3	1.69
2008	37.5	1.14
2009	29.2	0.89
2010	26.2	0.80
2011	17.7	0.54

c. "Tail" Period

Dr. Wills recognized that Amazon's website technology retained value following the useful-life period he posited. Indeed, as shown in the table above, the technology had non-trivial value left at year-end 2011. Dr. Wills accounted for this value by adding to the useful-life period a "tail" of three and a half years, during which AEHT was to pay a flat annual royalty of 0.2%. We agree that a "tail" period is appropriate, but we find that it should bear a higher royalty rate.

Dr. Wills explained that he added "a tail royalty to reflect the continued presence of some base of source code over an extended period of time" and to reflect the fact "that even 'commoditized' code may have some value." In re-

spondent's view, Dr. Wills' "tail" does not capture the full residual value of Amazon's technology because he focused only on the continued presence of source code. As respondent notes, AEHT was required to pay for the value of intangible property made available to it "for purposes of research in the intangible development area." Sec. 1.482-7(g)(2), Income Tax Regs. Respondent urges that Amazon's website technology had value for research purposes that Dr. Wills did not factor into his analysis.

We agree with respondent to some extent. Dr. Cohen's testimony, coupled with that of Amazon's software engineers, established that Amazon practiced (among other things) "concept reuse," "partitioning," and "refactoring" when developing subsequent iterations of its website technology. "Concept reuse" refers to the practice of reusing ideas, algorithms, and ways of working. "Partitioning," which splits a centralized software system into units of work or storage, and "refactoring," which restructures prior software, see supra note 9, may also entail reuse of prior solutions and concepts. Colloquially speaking, Amazon's old technology gave it a "head start" or "leg up" in developing new technology.

On the other hand, the evidence established that Amazon reused earlier code to a limited degree, prioritizing speed of innovation over software reuse. Its engineers would often start over, more or less from scratch, when building new archi-

tecture or services. This was attributable in part to Amazon's high turnover rates: Later hired engineers often found their predecessors' coding difficult to understand and preferred a fresh start.

The switch to new software languages posed another impediment to reusing old code. During the transition from Obidos to Gurupa, Amazon abandoned catsubst (an arcane programming language it created) and shifted to Perl/Mason for building webpages. Amazon could reuse very little of the Obidos software when it moved to Gurupa. Amazon subsequently abandoned Perl/Mason, a "dying" language unfamiliar to the next generation of programmers; again much pre-existing source code was discarded. This tendency applied not only to coding but also to concepts: Many concepts that underlay the monolithic Obidos architecture were inapplicable to a distributed system.

Many aspects of Amazon's technology, moreover, were completely novel and could not rely extensively on pre-existing concepts or ways of working. Kindle, Fire TV, Fire smartphones, cloud computing, and cloud storage were created and marketed after Project Goldcrest was completed. The revenue base on which AEHT was to pay royalties included projected revenues from these new inventions. There is no indication that these new inventions relied on old source code or prior ideas or (if they did) that such reliance was significant.

We thus confront a dilemma similar to others we face in this case. Respondent plausibly contends that the "tail" proposed by Dr. Wills may not capture the full residual value of the website technology transferred under the CSA. But respondent's alternative is to insist that the technology has a perpetual useful life; we have rejected that argument, and respondent's experts have not offered a coherent formula for calculating a revised "tail" period. That being so, we will accept as appropriate the 3-1/2-year "tail" period proposed by Dr. Wills.

We conclude, however, that the 0.20% royalty proposed by Dr. Wills for this "tail" period is too low. He chose that rate by "stepping down" from the 0.27% rate that he used for the final year of the technology's useful life. We have determined that the appropriate royalty rate for the final year of the technology's useful life is 0.54%, or twice as high. See supra p. 117. We accordingly find that the royalty rate for the "tail" period should be twice as high as that proposed by Dr. Wills, or 0.40%. We conclude that this higher royalty rate, paid throughout the 3-1/2-year "tail" period commencing January 1, 2012, will adequately compensate Amazon US not only for the continued presence of source code but also for the research value of its original technology.[30]

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[30]Respondent's expert James Conley argues that petitioner's valuation of the website technology does not capture the full value of Amazon's patents. The trial

(continued...)

3. Revenue Base

While relying on management projections in determining AEHT's revenue base for 2005-2011, the experts disagree about the proper revenue base for calculating royalties thereafter. Dr. Wills used a "50% declining balance" method to estimate AEHT's post-2011 revenues.[31] Dr. Higinbotham projected much higher post-2011 revenues, relying chiefly on a draft spreadsheet that an Amazon employee created in December 2005 to estimate future "goodwill impairment" for financial reporting purposes. Dr. Higinbotham also relied on a report prepared in October 2013 by a third-party investment analyst. Using these sources Dr.

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[30](...continued)
established that the value of Amazon's patents was fairly inconsequential. In any event, AEHT would be required to compensate Amazon US only for European patents; the vast bulk of Amazon's patents were issued in the United States and would have little or no value in Europe. Scott Hayden credibly testified that it was much more difficult for Amazon to obtain patents for its inventions in Europe. Given these facts, we find that the European patent portfolio had a relatively low value and that the useful life of the technology plus the "tail" period adequately captures the value of this portfolio.

[31]Under a "50% declining balance" method, the growth rate is reduced by 50% each year until it reaches a "stable" growth rate. Dr. Wills and Mr. Reilly selected 4% as AEHT's stable growth rate, based on predicted long-term growth and inflation projections for the eurozone.

Higinbotham projected that AEHT's post-2011 revenues would grow at a rate up to three times faster than projected by Dr. Wills.[32]

We find several flaws in Dr. Higinbotham's approach. The "goodwill impairment" model on which he relied was developed by a new employee in Amazon's accounting department. This employee testified that he was then in his orientation period; that he was given the prior year's model and told to "mark it up"; and that he spent his first few weeks at Amazon learning how the model worked by plugging in different variables. There is no indication that this spreadsheet presented reliable projections of Amazon's future revenue. Moreover, both the "goodwill impairment" spreadsheet (prepared in December 2005) and the third-party investment report (prepared in October 2013) post-dated the CSA transfer on January 1, 2005. Dr. Higinbotham's projections would have been more reliable had he relied on ex ante sources, as Dr. Wills did.

The growth rates assumed by Dr. Higinbotham were outliers even among respondent's experts. Dr. Frisch and Mr. Haigh (in his opening report) assumed that AEHT's post-2011 revenues would grow at annual rates between 3.8% and 4%;

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[32]Dr. Higinbotham assumed that AEHT's revenues would grow at an annual rate of 22.5% during 2010-2015, 17.5% during 2016-2020, and 8% during 2021-2030. After 2030 he adopted a terminal growth rate of 3.4% based on predicted long-term growth and inflation projections for the eurozone.

Dr. Higinbotham assumed that AEHT's post-2011 revenues would grow at annual rates ranging from a high of 22.5% to a low of 8%. We accordingly reject Dr. Higinbotham's approach and accept the post-2011 revenues determined by Dr. Wills.

A final question concerns the starting date for AEHT's royalty payments. The CSA was effective as of January 1, 2005, and AEHT made cost sharing payments starting as of that date. But the "business transfer" did not occur until May 1, 2006, and AEHT earned no gross revenues (attributable to Amazon's website business or otherwise) before that date.[33] Dr. Wills noted that May 1, 2006, was the date on which AEHT became the "economic principal" for the European market and "commenced use of the intangibles for its own account." He accordingly opined that May 1, 2006, was the appropriate starting date for payment of royalties for the website technology. Dr. Frisch reached the same conclusion in his DCF analysis.

We concur in the consensus that these two experts reached. Indeed, no expert for either side opined that AEHT should be required to pay royalties for the

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[33]To enable AEHT to make its required cost sharing payments before May 1, 2006, Amazon US made capital contributions to AEHT through a series of transactions involving cash and preferred stock. Respondent has not challenged any of those transactions.

website technology for any period before May 1, 2006. Because an unrelated third party would not pay royalties until it actually began earning income from the European website business, the starting date for payment of royalties is May 1, 2006.

4. Discount Rate

The discount rate is used to convert future income streams--here, AEHT's projected royalty payments--into a lump-sum present value. Dr. Wills adopted the discount rate calculated by Mr. Reilly, another of petitioner's experts. Mr. Reilly, applying the capital asset pricing model (CAPM),[34] opined that an 18% discount rate properly corresponded to Amazon's weighted average cost of capital (WACC).[35]

Dr. Higinbotham also used the CAPM to determine his WACC, but he selected 14% as the appropriate discount rate. He differed from Mr. Reilly chiefly in how he determined Amazon's "beta," a key element in the CAPM calculus.

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[34]CAPM is a standard and widely used method to determine a company's cost of equity capital. Under the CAPM the expected rate of return for a company's equity is generally the risk-free rate of return plus the product of beta and an equity risk premium.

[35]In Veritas, 133 T.C. at 324 n.33, we explained: "The WACC provides the expected rate of return for a company on the basis of the average portion of debt and equity in the company's capital structure, the current required return on equity (i.e., cost of equity), and the company's cost of debt."

"Beta" measures the volatility (and hence riskiness) of a security in comparison to the market as a whole. Both experts used stock market data compiled by Bloomberg for 2000-2004 to calculate Amazon's beta. But whereas Mr. Reilly used monthly data, Dr. Higinbotham used weekly data. Using monthly data, Mr. Reilly calculated a beta of 2.00; using weekly data, Dr. Higinbotham calculated a beta of 1.55.

Petitioner contends, with strong support from its experts, that monthly data more accurately measure Amazon's volatility compared to the overall market. According to Dr. Unni: "While weekly measurements of returns provide more data points, it skews the measurement of Amazon's beta downwards because serial correlations in stock returns, which distort the measurement of beta, are pronounced when the returns interval is as short as a week, but are substantially less evident with a returns interval of a month." Leading finance textbooks and important scholarly articles use five years of monthly stock market data to calculate a company's beta.[36] Major providers of financial information (such as Ibbotson and

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[36]See Fischer Black, Michael C. Jensen & Myron Scholes, The Capital Asset Pricing Model: Some Empirical Tests, in Studies in the Theory of Capital Markets 85-87 (Jensen ed. 1972); Zvi Bodie, Alan J. Marcus & Alex Kane, Investments 258 (9th ed. 2011); Richard A. Brealey & Stewart C. Myers, Principles of Corporate Finance 217 (10th ed. 2011); Eugene F. Fama & James D. MacBeth, "Risk, Return, and Equilibrium: Empirical Tests," 81 J. Political Econ. 607-636

(continued...)

Standard & Poor's), as well as more popular sources (such as Motley Fool, First Call, and MSN Money), do the same.[37]

Petitioner's experts have presented the more compelling case on this point. Dr. Higinbotham acknowledged that his decision to use a weekly rather than a monthly beta was "virtually a random choice." Dr. Frisch, respondent's principal valuation expert, used an 18% discount rate under his DCF approach; like Mr. Reilly, he calculated a beta of 2.00 using five-year monthly data. The adjustments in the notice of deficiency were based on Dr. Frisch's report, and he affirmed at trial his belief that an 18% discount rate was correct. Dr. Higinbotham agreed that switching to a monthly beta would increase his WACC to roughly 18%, and we find that the appropriate discount rate on January 1, 2005, was 18%.[38]

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[36](...continued)
(1973); Reinhold P. Lamb & Katheryn Northington, "The Root of Reported Betas," J. Investing 50-53 (2001).

[37]Mr. Haigh, respondent's trademark expert, cited a treatise by Shannon Pratt to support use of five-year weekly data. But that treatise provides at best inconclusive support for this proposition. See Shannon P. Pratt, Cost of Capital (2d ed. 2002) ("Monthly is the most common frequency, although Value Line uses five years of weekly data.").

[38]Respondent notes that Amazon's treasury department, for internal discussion purposes, used a discount rate of 13% when evaluating prospective investments. But Dr. Frisch characterized this internal rate as an inaccurate measure of the riskiness of AEHT's business. In that respect his views align with those of Mr.
(continued...)

B. Marketing Intangibles

The marketing intangibles made available to AEHT include the Amazon name, domain names, trademarks, trade names, and trade dress. The parties' experts agreed that the CUT method provides the best method for determining the arm's-length buy-in payment for the marketing intangibles. They also used the same sources of public information --licensing information reported in the ktMINE database[39]--to derive their external CUTs.

Petitioner's expert Mr. Reilly identified six comparable license agreements with royalty rates ranging from 0.125% to 1% of sales. He selected the median of these rates, or 0.59%, as his base rate, which he reduced to reflect a volume discount. He estimated that the marketing intangibles had a remaining useful life of 10 to 15 years, and he identified the revenue stream associated with their use on the basis of management's projections and a growth assumption after 2011.

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[38](...continued)
Szkutak, Amazon's chief financial officer. He testified that the treasury department rate was a mere benchmark that was increased, to rates above 18%, for speculative investments related to future performance. We decline to adopt as the appropriate discount rate the benchmark rate that Amazon used internally.

[39]The ktMINE database includes more than 15,000 intangible asset agreements and allows subscribers to conduct customized searches.

Applying a discount rate of 18%, he calculated a value of $251 million to $312 million for all of the European marketing intangibles.

David Franklyn, another of petitioner's experts, opined that these values must be adjusted to reflect the fact that the European Subsidiaries before Project Goldcrest already owned certain of these marketing intangibles. After excluding the value of previously owned intangibles, which Mr. Franklyn believed to represent about 50% of the total value, Mr. Reilly concluded that the buy-in payment required from AEHT for the marketing intangibles was $115 to $165 million.

Respondent's expert Mr. Haigh initially identified four comparable license agreements (including one selected by Mr. Reilly) with royalty rates ranging from 0.5% to 2% of sales. He selected the highest of these rates, or 2.0%, as his base rate, and he applied no volume discount. He assumed that the marketing intangibles had a perpetual or "indefinite" useful life. Applying a discount rate of 13.3% to an assumed revenue base, he calculated in his opening report a value of $1.8 billion for the marketing intangibles. Adopting even higher revenue assumptions in his rebuttal report, he valued the marketing intangibles at $3.13 billion. Respondent contends that this figure should not be reduced to account for prior ownership of any marketing intangibles by the European Subsidiaries.

While the parties' experts have adopted similar approaches, they disagree on five major inputs into the CUT valuation: (1) the proper royalty rate; (2) the useful life of the marketing intangibles; (3) the revenue base to which the royalty should be applied; (4) the appropriate discount rate; and (5) the extent (if any) to which the buy-in payment must be adjusted to reflect the European Subsidiaries' prior ownership of certain marketing intangibles. We address these issues in turn.

1. Royalty Rate

Petitioner's expert Mr. Reilly searched for exclusive trademark licensing agreements that involved products similar to those sold by Amazon and that calculated royalties as a percentage of revenue, with no collateral transactions. From the 167 agreements that he found in the retail and Internet categories,[40] he initially selected the following six transactions as comparable and chose as his base royalty the median of these rates, or 0.59%:

[40]In his ktMINE database search, Mr. Reilly found 7,724 agreements in effect on January 1, 2005. Of these, 865 were in the "marketing intangible" category. Narrowing his search to the retail and Internet industries yielded 167 agreements, all of which he reviewed to find CUTs. He conducted similar searches using two other search engines (Royalty Source and Royalty Range) but did not identify any additional CUTs.

Licensor	Licensee	Royalty (percent)
Merchandising Corp.	Sports Archive	1.00
Sports Authority Michigan	Mega Sports Co.	0.850
Rampage Licensing	Charlotte Russe	0.750
F.A.O. Schwarz Fdn.	The Right Start	0.438
Kmart Corp.	Kmart Australia	0.188
Kmart Corp.	Kmart New Zealand	0.125

Mr. Haigh initially selected from the ktMINE database the following four transactions as comparable and opined that Amazon's brand strength justified choosing as his base royalty the highest of these rates, or 2.0%:

Licensor	Licensee	Royalty (percent)
SNAP!	ValueVision Int'l	2.00
MacMark	Equilink Licensing	2.00
Sports Authority Michigan	Mega Sports Co.	1.20
Radio Shack	InterTAN Australia	1.00

In his rebuttal report Mr. Reilly accepted one of Mr. Haigh's choices--the Radio Shack agreement--as a valid comparable. At trial Mr. Haigh found no fault in two of Mr. Reilly's choices--the Merchandising Corp. and Rampage Licensing agreements--as valid comparables. We will accept all three agreements as comparables, evidencing royalty rates of 1.0%, 1.0%, and 0.75%, respectively.

Both experts selected the Sports Authority Michigan license as a comparable but derived different royalty rates from it. That agreement specified a royalty rate starting in 2003 at 1.2% and declining annually to 0.5% in 2015. Whereas Mr. Haigh selected the starting rate (1.2%), Mr. Reilly took the simple average (0.85%) of all rates in the agreement. Mr. Reilly's choice was reasonable because the rate during most years of the initial term was 0.8%; Mr. Haigh acknowledged that extending the agreement's terms to perpetuity would yield a rate close to 0.5%. We accept the Michigan Sports Authority agreement as a comparable evidencing a 0.85% royalty rate as determined by Mr. Reilly.

The experts disagree as to the comparability of the other five licensing agreements. For the following reasons, we find that none of them supplies a reliable comparable.

• The F.A.O. Schwarz trademark was licensed by the F.A.O. Schwarz Family Foundation to The Right Start, which in 2001 had purchased 23 of the remaining F.A.O. Schwarz toy stores in North America. The media described that transaction as "resembling a distress sale." This is not the sign of a financially healthy company or brand; the F.A.O. Schwarz brand was in serious decline, whereas the Amazon brand was on the opposite trajectory. Petitioner has failed to convince us that this is a reliable comparable.

• The Kmart trademark was licensed in 1994 by Kmart US to Kmart New Zealand and Kmart Australia, both of which were then owned by an unrelated party. The Kmart brand was also in decline: Many of its US stores were outdated and in decaying condition, and by the 1990s the press labeled Kmart a "'discount store dud' in need of revitalization." Perhaps for that reason, the royalty rates specified in these agreements (0.125% and 0.188%) are extremely low by comparison with the others. Petitioner has failed to convince us that these two (substantially similar) agreements furnish reliable comparables.

• A trademark for all MacGregor branded products was licensed in 2000 by MacMark to Equilink. We agree with Mr. Reilly that this agreement is noncomparable for three reasons. First, "it covers the rights to use trademarks to manufacture, brand, and sell physical products," whereas Amazon's marketing intangibles do not convey such rights. Second, this license agreement was executed as part of a litigation settlement; the parties' relative bargaining power is unclear, and the royalty rate may reflect other concessions. Third, the agreement's pricing provisions are complex; Mr. Haigh admitted that the actual royalty rate could be as low as 0.56% under certain conditions, well below the 2% headline rate. For all these reasons, respondent has failed to convince us that this agreement furnishes a

reliable comparable (or if it be thought comparable) that it supports a royalty as high as 2.0%.

• The SNAP! trademark was licensed to ValueVision in 1999. We find this agreement noncomparable for three reasons. First, most of the products it covered were high-margin jewelry items; AEHT was not a high-margin retailer, and an unrelated party in its position would consider that fact in determining whether to pay a royalty as high as 2%.[41] Second, the parties to this agreement were almost related: General Electric, through its NBC subsidiary, owned a significant stake in ValueVision, and SNAP! became a wholly owned subsidiary of NBC one month later. Third, NBC in 2001 announced a rebranding strategy and "effectively terminated the Snap trademark license [agreement]." In effect, therefore, the SNAP! agreement was a dead letter when the CSA was executed in January 2005.

After eliminating the five license agreements we find to be noncomparable, we are left with the following four agreements that the parties agree supply reliable CUTs, with the following royalty rates:

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[41]On cross-examination Mr. Haigh was surprised to learn that he had relied on inflated profit margins that did not account for AEHT's projected IDC expenses. He acknowledged that AEHT's actual profit margins could dictate a royalty rate below the 2% rate he chose.

Licensor	Licensee	Royalty (percent)
Merchandising Corp. America	Sports Archives	1.00
Radio Shack	InterTAN Australia	1.00
Sports Authority Michigan	Mega Sports Co.	0.85
Rampage Licensing	Charlotte Russe	0.75

Given the strength of Amazon's brand in 2005, we agree with Mr. Haigh that it is appropriate to select as the base royalty rate the highest of these rates (1.0%), which does not differ greatly from the median (0.925%) or the average (0.90%).

Mr. Reilly noted that trademark license agreements sometimes include a "waterfall" structure that reduces the base royalty rate at higher sales volumes. Opining that a downward volume adjustment would be reasonable here, he reduced his starting royalty rate by up to 33 basis points as AEHT's projected revenues reached certain thresholds. He cited his valuation experience, as opposed to specific external or internal CUT evidence, to justify this reduction.

Mr. Reilly acknowledged that "waterfall" structures are atypical in agreements that license marketing intangibles. Of the 167 such agreements that he found in the retail and Internet categories, only eight had downward adjustments

keyed to higher sales volumes. Mr. Reilly acknowledged that "in certain instances trademark license royalty rates increase over time or with increased revenue." In fact, Mr. Haigh looked at 700 agreements and found 21 that featured increasing royalty rates.

We find that flat royalty rates are the norm in agreements of this type. Even if a volume adjustment were thought appropriate, the evidence is conflicting as to whether the rate should be adjusted upward or downward. We thus conclude that the arm's-length royalty AEHT must pay for the marketing intangibles is a flat 1.00%.[42]

2. Useful Life

The parties disagree as to whether the marketing intangibles had a limited useful life (as petitioner contends) or a perpetual or "indefinite" useful life (as respondent contends). Petitioner presented testimony from five expert witnesses. They were unanimous in concluding that the useful life of the marketing intan-

[42]When valuing the website technology, we applied a 25-basis-point downward adjustment to the royalty rate because Amazon's M.com agreements, used as comparables there, provided evidence justifying a modest volume discount. Here we are considering external rather than internal CUTs, and the external CUTs supply no convincing evidence to support reducing the royalty rate at higher sales volumes.

gibles, while lengthier than that of the website technology, was not perpetual. We agree.

Mr. Reilly estimated that the useful life of the marketing intangibles was in the range of 10 to 15 years. Like Dr. Unni and Mr. Lasinski, he began by focusing on the terms of the relationship between Amazon US and AEHT. After May 1, 2006, AEHT was responsible for all advertising, development, and trademark-maintenance expenses relating to the European marketing intangibles. Mr. Reilly opined that this is unusual in trademark license agreements; typically, at least some trademark-related expenses continue to be borne by the licensor during the license term.

Because the going-forward value of the marketing intangibles would increasingly be attributable to marketing investments by AEHT, an unrelated party in its position would not agree to pay royalties forever. As Mr. Reilly explained: "A trademark is, at any specific moment, the product of investments of the past. * * * [F]uture investments can replace those made in the past, and therefore the value of a trademark built by investments of the past will diminish. Its place will then be taken by the value resulting from new investment." See Nestle Holdings, Inc. v. Commissioner, T.C. Memo. 1995-441, 70 T.C.M. (CCH) 682, 696 ("Trademarks lose substantial value without adequate investment, management,

marketing, advertising, and sales organization."), rev'd in part and remanded on other grounds, 152 F.3d 83 (2d Cir. 1998).

Petitioners' experts also noted that the value of Amazon's trademarks or "brand" was closely linked to the state of its technology. If consumers were dissatisfied with their shopping experience, Amazon's marketing intangibles would rapidly decline in value. AEHT was responsible, not only for ongoing marketing expenses, but also (under the CSA) for its pro rata share of future IDCs that were essential to sustaining the website technology.

As Dr. Unni put it: "[T]he incremental profits associated to [the marketing] intangibles are progressively attributable to the future business efforts and technology co-development of Amazon Europe." He determined that any profits attributable to such intangibles after a period of 15 to 20 years would reflect the quality of AEHT's ongoing business execution and the effectiveness of supporting technology and subsequently developed intangibles for which AEHT had paid. Mr. Lasinski similarly opined that, if a licensee anticipates incurring substantial future expenses to sustain the value of the licensed marks, it will negotiate for limited-duration payment structures, lower royalty rates, or other concessionary provisions.

Robert Dolan approached this problem from a different perspective, employing a well-established marketing methodology that analyzed the risks the Amazon brand faced as of January 1, 2005. These risks included low switching costs for customers; problems stemming from excessively fast growth; intense pressure from online competitors and brick-and-mortar stores; and the risk that key collaborators (such as suppliers or delivery services) would disappoint. He noted that, owing to the lack of "emotional appeal" in Amazon's value proposition, the relative contribution of its brand--as opposed (say) to the Hermès and Gucci brands--was quite limited.[43] For these reasons, he concluded that Amazon's marketing intangibles should not be valued into perpetuity.

Peter Golder, another of petitioner's experts, used empirical data for technology-driven companies to estimate a useful life for Amazon's marketing intangibles. As he explained: "It is important to remember that expectations about Amazon's brand are being made as of January 1, 2005, and therefore must not incor-

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[43]To support this proposition Professor Dolan cited academic literature and Millward Brown's "brand contribution" measure of Amazon. Millward Brown uses a 1 to 5 scale to measure the importance that brand (as compared with price and product features) plays in a company's success. Companies with an index of 5 (including such luxury brands as Hermès, Gucci, Rolex, and Porsche) derive the greatest proportion of their value from the brand itself. Companies with an index of 1 (including Domino's Pizza and 76 Motor Fuels) derive the least proportion of their value from the brand itself. Millward Brown gave Amazon a rating of 2 on this scale, which is consistent with a relatively low brand impact assessment.

porate today's hindsight." He noted that the dot.com crash had occurred just four years previously; that thousands of Internet companies had failed; that Internet retailing (especially in Europe) was still in its infancy; that Amazon's ability to extend its reach into new product categories was uncertain; and that 75% of independent financial analysts in 2005 had a sell or hold rating on Amazon's stock.

For his second empirical analysis, which we found most persuasive, Dr. Golder estimated the longevity of leaders and significant competitors in seven eCommerce markets: online brokerages, Internet search engines, online social networks, travel websites, web browsers, smartphones, and video game consoles. He determined that many well-known brands had failed, including more than half of the market pioneers, which had an average time to failure of seven years. His analysis generated estimated useful lives ranging from 10.9 to 16.5 years for all seven markets, which increased to 19.9 years when pioneers that failed early were omitted.

Respondent's expert Mr. Haigh focused on the useful life of the Amazon "brand," acknowledging that there is "little consensus on whether a brand has a finite or an indefinite" useful life. He noted that, under applicable accounting standards, "the facts indicate whether the asset has a finite life or not." He then made the following assumption:

> It is my assumption that the brand has an indefinite * * * [useful life]. This is based on the assumption that there is no foreseeable limit to the period over which the brand is expected to generate net cash inflows for its businesses. This also assumes that trademark registration renewals are filed at the appropriate time and sufficient investment is made in terms of marketing and communication to maintain the value inherent in the brand.

Mr. Haigh's opening report referenced only one perpetual license, and that agreement included a lifetime cap on royalties. He admitted that he would not have advised AEHT to pay perpetual royalties for the marketing intangibles.

Other than Mr. Haigh, respondent relied on two experts in an effort to demonstrate the longevity of Amazon's "brand" as of January 1, 2005. Dr. Conley, relying on a theory of "value transference," opined that properly managed technology assets enhance the value and extend the life of a company's brand. He sought to illustrate "value transference" with examples involving an artificial sweetener and generic pharmaceuticals. But Dr. Dolan showed that these examples proved the opposite: Once the patent expired, the products lost significant value and market share. Dr. Conley admitted that his "value transference" theory has never been adopted within the valuation community, is not incorporated in any accounting standards, and has not been adopted by any court. We did not find it persuasive.

Respondent's final expert, Robert J. Wilcox, opined that a brand name simplifies consumers' decision making, that brand names are important in the online world, and that Amazon in January 2005 had a strong brand in Europe. Although we found this testimony persuasive, Dr. Wilcox did not opine on the actual useful life of Amazon's trademarks or brand. His report does not support respondent's contention that the marketing intangibles had a perpetual useful life.

Having considered the testimony of these eight experts in light of our findings of fact, we conclude that the marketing intangibles did not have a perpetual useful life, and we reject respondent's contention that they did. Our conclusion is based on numerous factors as to which petitioner's experts testified, including the fact that the Internet retail industry was young, the fact that Amazon had operated in Europe for only six years, and the fact that Amazon's success depended heavily on short-lived technology assets. But our conclusion rests chiefly on the facts that AEHT assumed sole responsibility to maintain and develop the marketing intangibles in Europe and paid, through cost sharing, for the technological improvements essential to maintaining the value of those marketing intangibles.

Petitioner's experts presented us with useful life estimates for the marketing intangibles that ranged between 8 and 20 years. Mr. Reilly and Dr. Dolan embraced a 10-15 year range. Dr. Unni embraced a 15-20 year range. Dr. Golder

opined that the useful life could be as short as 8 years but (with certain assumptions and adjustments) could be as long as 20 years.

We conclude that a useful life at the top of these ranges is appropriate. We agree with Dr. Wilcox that Amazon at year-end 2004 had a very strong brand in Europe and that the strength of its brand supports a relatively long useful life. By 2000 Amazon's primary domains in the UK, Germany, and France represented the three most popular online retail domains in Europe. In all three countries Amazon had the highest brand awareness of any online retailer. When asked about places to shop on the Internet in 2005, European customers told pollsters that Amazon was the brand that first came to mind. Considering all the evidence, we find that the marketing intangibles had a useful life of 20 years, which is the top end of Dr. Unni's and Dr. Golder's ranges and not too far from the high end of Mr. Reilly's range.[44]

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[44]Mr. Reilly believed that a "ramp down" could be justified toward the end of the marketing intangibles' useful life, but he did not include a decay curve in his valuation. As he explained, this was a conservative assumption that arguably introduced "an upward bias in his final buy-in price conclusion." Since petitioner does not urge application of a decay curve here, we have no occasion to decide whether it would be appropriate.

3. Revenue Base

With one minor exception noted below, the parties agree that royalties for the marketing intangibles should be figured on the same revenue base as royalties for the website technology, namely, AEHT's projected revenues over the useful life of the relevant assets. All experts agree on using management projections to determine AEHT's revenue base for 2005-2011. We have already approved, in connection with the website technology, Dr. Wills' use of a "50% declining balance" method to estimate AEHT's post-2011 revenues. See supra pp. 121-123. We again approve use of that method to estimate AEHT's revenues beginning in 2012 and continuing through the end of the 20-year useful life we have ascribed to the marketing intangibles.

Employing the 50% declining balance method, Mr. Reilly reduced AEHT's revenue growth rate by 50% for each post-2011 year until it reached a "stable" rate. He selected 4% as AEHT's stable growth rate, using long-term growth and inflation projections for the eurozone. Under this approach, which we accept here, AEHT's rate of revenue growth declined to its 4% stable rate starting in 2017.

In his opening report, Mr. Haigh adopted a more conservative assumption. He likewise selected 4% as AEHT's long-term growth rate, but he assumed that AEHT would reach this lower rate much more quickly, beginning in 2012. In his

rebuttal report, by contrast, Mr. Haigh switched to use of a 10-year, straight-line decline from AEHT's 2011 growth rate; this nearly doubled, to $3.13 billion, his buy-in valuation of the marketing intangibles. He offered no convincing rationale for this 11th-hour change of opinion, and we did not find it persuasive.[45]

The parties disagree concerning one small detail of the revenue base calculation, namely, whether revenues attributable to giftwrap, shipping, and miscellaneous services should be excluded from AEHT's projected revenue stream for purposes of calculating royalties on the marketing intangibles. Mr. Reilly excluded these revenues because these services were projected to operate at a significant loss; in his opinion, an arm's-length licensee would not pay royalties on negative revenue streams. Mr. Haigh took the opposite position, urging that "[t]hese sources of revenue are directly linked to the brand because [they] * * * would not arise unless the customer gravitated towards the website through, in part, the making available of the Amazon brand in Europe."

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[45]Because Mr. Haigh did not, before his rebuttal report, question the propriety of using the 50% declining balance method, the testimony and other evidence on this point were limited. During his oral testimony Mr. Reilly cited a publication by McKinsey & Co., "Valuation: Measuring and Managing the Value of Companies," for the proposition that the 50% declining balance method is a standard valuation technique for moving from revenue projections to long-term growth rates. On the basis of the limited testimony provided to us, we have no reason to question the appropriateness of employing that method here.

We conclude that Mr. Reilly correctly excluded these revenues. Before Project Goldcrest various intercompany agreements designated the European Subsidiaries "commissionaires" for Amazon US, entitling them to commissions based on their net sales. The term "net sales" was defined to exclude giftwrap, shipping, and miscellaneous services revenue. Because Amazon US refused to pay commissions on these types of revenue, we conclude that AEHT, operating at arm's length, would likewise refuse to pay royalties thereon.[46]

A final question concerns the starting date for AEHT's payment of royalties for the marketing intangibles. As for the website technology, we find that the starting date for payment of royalties is May 1, 2006. By its terms, the Assignment Agreement conveying the right to use the marketing intangibles remained executory until May 1, 2006, the "business transfer date." All of petitioner's

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[46]One month after filing his simultaneous answering brief respondent sought leave to file an amended opening brief containing citations of other intercompany agreements that allegedly defined "net sales" differently. We denied that motion as unfairly prejudicial to petitioner. See sec. 151(e)(3) (requiring that a party's opening brief include citations of "the pages of the transcript or the exhibits or other sources relied upon to support" each proposed finding of fact, thus enabling the opposing party to "set forth any objections, together with the reasons therefor"). We note that exclusion of giftwrap, shipping and miscellaneous service revenues results in a very small adjustment to the revenue base.

experts, and all but one of respondent's experts, agreed that May 1, 2006, was the appropriate starting date for payment of royalties, and we share their consensus.[47]

4. Discount Rate

We have already determined that an 18% discount rate is appropriate when valuing the website technology. See supra pp. 124-126. We see no reason to adopt a different discount rate when valuing the marketing intangibles. We will briefly address Mr. Haigh's submission that a 13.3% discount rate should be used instead.

In determining his discount rate, Mr. Haigh accords Amazon a 1.45 beta, as opposed to the 2.0 beta upon which Mr. Reilly and Dr. Frisch agreed. This difference partly reflects Mr. Haigh's use of weekly rather than monthly stock market data, which we have already rejected. See supra pp. 124-126. The rest of the difference reflects the fact that Mr. Haigh does not compute the beta for Amazon itself; instead he uses an average of betas derived from companies he regards as comparable, such as eBay, Yahoo!, Netflix, Overstock.com, Barnes & Noble, and 1-800-Flowers.

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[47]Mr. Haigh calculated his buy-in obligation for the marketing intangibles starting January 1, 2005. He provided no explanation for choosing this date, other than his understanding that his assignment was to value the intangibles as of December 31, 2004.

We reject this approach. As Dr. Unni explains, a valuation expert typically looks to comparable companies to derive a beta when the subject company's stock is thinly traded or not publicly traded at all. That is not the situation here: Amazon was a very actively traded stock, with an average daily NASDAQ trading volume of 8.51 million shares during 2004. Because the Bloomberg market data were more than sufficient to compute Amazon's beta directly, as every other expert in this case did, there was no need to consult data concerning other companies.[48]

5. European Portfolio

Petitioner contends that roughly half the value of the marketing intangibles was owned by the European Subsidiaries before Project Goldcrest. Because the assets to that extent were not owned by Amazon US or transferred to AEHT under the License or Assignment Agreement, petitioner urges that their value should be excluded from the buy-in payment. Petitioner tasked one of its experts, Mr. Franklyn, with responsibility for examining the European registration files, ascertaining which domain names and marks were legally owned by the European Sub-

[48]We think Mr. Haigh also erred, when calculating Amazon's equity risk premium, in rejecting the Ibbotson Associates data upon which all the other experts relied. As we noted in Veritas, 133 T.C. at 325, Ibbotson Associates presents "the recognized industry standard of historical capital markets data."

sidiaries, and determining what percentage of the overall value should be allocated to those assets. This task was complicated by the fact that certain marks (as explained more fully below) had been registered in Europe both by Amazon US and by Amazon Germany.

We will refer to the intangibles owned by the European Subsidiaries and/or legally registered in their names as the European portfolio. Mr. Franklyn determined that the European portfolio consisted of the following: (1) the editorial content of the UK, German, and French websites, owned respectively by Amazon UK, Amazon Germany, and Amazon France; (2) at least 10 trademarks registered by Amazon Germany, including "Amazon," "Amazon.com," and "Amazon and Design" (often called the "Amazon Smile"); (3) numerous domain names owned by Amazon Germany, the most important of which was "amazon.de"; and (4) certain domain names owned by Amazon France, the most important of which was "amazon.fr."

a. Ownership of the European Portfolio

Respondent presents as a threshold question whether the European Subsidiaries should be considered, for Federal income tax purposes, as truly "owning" the European Portfolio. For assets that are legally protected, like those here, the regulations provide that "[t]he legal owner of a right to exploit an intangible ordi-

narily will be considered the owner." See sec. 1.482-4(f)(3)(ii)(A), Income Tax Regs.; cf. id. subdiv. (ii)(B) (considering developer to be the owner of intangibles that are not legally protected). However, a different ownership agreement may be imputed "if the conduct of the controlled taxpayers indicates the existence in substance of such an agreement." Sec. 1.482-4(f)(3)(ii)(A), Income Tax Regs.; see sec. 1.482-1(d)(3)(ii)(B)(2), Income Tax Regs. (authorizing district director to "impute a contractual agreement between the controlled taxpayers consistent with the economic substance of the transaction").

Respondent contends that Amazon US was the true equitable owner of any marketing intangibles legally owned by the European Subsidiaries. In respondent's view, Amazon US "made all of the investments and took all of the risks involved in building up the value of any items of IP that were registered in the European affiliates' names." Respondent accordingly urges that we should impute an agreement whereby Amazon US held an exclusive license to use any marketing intangibles nominally owned by the European Subsidiaries, or, alternatively, that the European Subsidiaries acted as "agents" of Amazon US in holding title to these assets. See Commissioner v. Bollinger, 485 U.S. 340, 346 (1988); Nat'l Carbide Corp. v. Commissioner, 336 U.S. 422, 436-437 (1949) (listing six factors as relevant to corporate "agency" determination).

We find neither of respondent's arguments persuasive. There clearly existed valid business reasons for localizing ownership of the European Portfolio in the European Subsidiaries. Under the laws of Germany and France at the relevant times, only local companies could obtain country-specific domain names (e.g., Amazon.de and Amazon.fr). Accordingly, Amazon Germany and Amazon France registered for their country-specific domain names. Amazon Germany registered a number of trademarks, including important marks like "Amazon" and "Amazon.com," to enable it to apply for international registrations in a simplified manner through the "Madrid Protocol."[49] At the relevant times, Amazon US could not do this directly because the United States was not a signatory of the Madrid Protocol.

[49]Under the Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks (Madrid Protocol), a trademark owner can file a single trademark-registration application with a single office, in one language, in one currency, with one set of fees. After filing this original application, the owner can submit an "international application" listing additional countries in which a trademark registration will be sought. The initial country's trademark office will confirm that the international application complies with local requirements, then forward it to the World Intellectual Property Organization (WIPO). The WIPO submits the international application to the individual trademark offices of the countries designated in the international application. The designated countries will then examine the international application in accordance with their own procedures for national trademarks.

Equally clearly, the European Subsidiaries used these domain names and marks in the active conduct of their business. Before January 2005 the European Subsidiaries were service providers for Amazon US. They had numerous employees of their own who were responsible for vendor and customer relationships. Because of differing cultural preferences, retail traditions, and national regulations, the details of these operations often varied from country to country. Local teams were thus integral to Amazon's success in Europe.

At the relevant times, the European Subsidiaries bore significant marketing risk. For example, under an October 2001 "Sales Commissionaire Agreement," Amazon US provided Amazon Germany "with appropriate incentives to perform a key role in contributing to the growth of the Website's Customer base" given its unique "ability to attract and retain customers for the Website through its understanding of German culture." Under this agreement Amazon Germany was entitled to a one-time bounty for each new customer, as well as commissions based on new customer sales and revenues from part of its international 3PS business.

Under this and similar agreements, the European Subsidiaries had an actual business risk because they received only a percentage of revenues. There was no guaranty that they would earn a profit based on their marketing efforts. Respondent thus errs in asserting that Amazon US "took all of the risk." At the time the

European Subsidiaries registered the trademarks and domain names included in the European Portfolio, they bore meaningful business risk.[50]

The European Subsidiaries also owned and operated the physical infrastructure supporting the European websites. This entailed complete responsibility for the warehouses, inventory, and fulfillment. The ultimate value of the European Portfolio hinged on the European Subsidiaries' ability to fulfill Amazon's promise of fast and accurate delivery. Their success in doing so contributed meaningfully to the value of these domain names and marks.

On these facts, we cannot find that the European Subsidiaries were mere "agents" of Amazon US for the purpose of holding title to the European Portfolio. As the ultimate parent, Amazon US had the ability to decide how ownership of the marketing intangibles would be dispersed within the corporate family. But there was a valid business justification for the European Subsidiaries' ownership of these domain names and marks, and they actually used these assets in the active conduct of their business. "[T]he mere fact of the parent's control over the subsidiaries * * * [does] not establish the existence of an agency, since such control is typical of all shareholder-corporation relationships." Commissioner v. Bollinger,

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[50]Amazon UK and Amazon Germany bore less business risk after December 31, 2003, when they began to supply services to Amazon US on a cost-plus basis.

485 U.S. at 346 (citing Nat'l Carbide Corp., 336 U.S. at 429-434); see Merck & Co. v. United States, 24 Cl. Ct. 73, 88 (1991) ("A parent corporation may create subsidiaries and determine which among its subsidiaries will earn income. The mere power to determine who in a controlled group will earn income cannot justify a Section 482 allocation from the entity that actually earned the income.").

Nor will we "impute a contractual agreement between the controlled taxpayers" to deem Amazon US the equitable owner of the European Portfolio. Sec. 1.482-1(d)(3)(ii)(B)(2), Income Tax Regs. The European Subsidiaries used the domain names and marks in the active conduct of their business; they helped develop the value of these intangible assets; and they took on significant marketing risk. The ownership structure did not lack economic substance, and there is thus no justification for departing from the general rule set forth in the regulations. See Claymont Invs., Inc., 90 T.C.M. (CCH) at 467; sec. 1.482-4(f)(3)(ii)(A), Income Tax Regs. (for legally protected property, "[t]he legal owner of a right to exploit an intangible ordinarily will be considered the owner"); sec. 1.482-1(d)(3)(ii)(B)(2), Income Tax Regs. (authorizing district director to impute a contrary agreement only if "consistent with the economic substance of the transaction").

b. Allocating Value to the European Portfolio

Before 2005 Amazon was growing rapidly and accounted for its trademarks and domain names rather haphazardly. Scott Hayden, petitioner's vice president of intellectual property, explained that Amazon in its early years did not have a systematic approach to its trademark portfolio and that its documentation revealed systemic errors. He testified that, if he questioned different people about Amazon's intangible property on different days, he would often get different answers.

In its tax reporting, Amazon treated the European Portfolio as a distinct group of assets but accorded it a much lower value than urged at trial. A Deloitte report entitled "Project Goldcrest: Transfer of Miscellaneous EU Subsidiary IP" noted that, under the Four-Party Agreement, the European Subsidiaries assigned their interests in the European Portfolio to AEHT for about $2 million. Deloitte determined that this price was reasonable. After discovering a clerical error in these numbers, petitioner increased the valuation of the European Portfolio to about $5 million. Mr. Franklyn, by contrast, opined that the European Portfolio was worth between $136 million and $147 million.

For trial purposes, Mr. Franklyn created two models--the "goods and services" model and the "coexistence" model--to allocate the value of the marketing intangibles between the European Portfolio and the US Portfolio (comprising the

trademarks and domain names that Amazon US owned). These models differed chiefly in how Mr. Franklyn accounted for overlapping and competing claims that Amazon US and Amazon Germany had to the same trademarks. In his "goods and services" model, Mr. Franklyn attempted to allocate value on the basis of the particular Nice classes that the competing trademark registrations covered.[51] In his "coexistence" model, he allocated value 50-50 between the European and the US Portfolios in cases of overlapping coverage, regardless of registration priority or Nice classifications claimed.

Under both models, Mr. Franklyn assigned the trademarks to one of three tiers, depending on their assumed importance to Amazon's business. To tier 1 he assigned Amazon's three most important marks, "Amazon," "Amazon.com," and "Amazon and Design." To tier 2 he assigned the five marks covering the most significant European domain names. To tier 3 he assigned 31 trademarks, the vast majority of which were owned by Amazon US. He deemed the marks assigned to

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[51]The Nice Classification is an international system recognized by national trademark offices as a means of describing and classifying goods and services in trademark applications. For example, tea may be appropriate for Nice class 5 as medicinal tea and for Nice class 30 as non-medicinal tea. By registering a mark for tea in class 30, an applicant may forfeit any protection that might be claimed under class 5. In Europe, Nice classes have an important practical impact on the scope of protection that a trademark affords. Amazon US and Amazon Germany filed, at various times, overlapping and competing registrations of the same trademarks under different Nice classes.

tier 1 to possess 75% of the total trademark value, the marks assigned to tier 2 to possess 18.8% of the total trademark value, and the marks assigned to tier 3 to possess 6.2% of the total trademark value. He allocated the value of the marks within each tier to the European or the US Portfolio on the basis of geographic coverage, trademark date priority, the existence of competing or overlapping claims, goods or services covered, and the projected revenues attributable to the various marks.

Under both the "goods and services" and the "coexistence" models, the European Portfolio received a very modest proportion of the tier 2 trademark value (averaging 21%) and a minuscule proportion of the tier 3 trademark value (averaging 3.4%). But Mr. Franklyn allocated to the European Portfolio the bulk of the tier 1 trademark value (63.6% and 50.7% under the "goods and services" and "coexistence" models, respectively). Because the tier 1 marks were weighted so heavily (at 75%) and the tier 3 marks so lightly (at 6.2%), the European Portfolio ended up with 52% and 42% of the aggregate trademark value under Mr. Franklyn's two approaches. Those percentages rose to 54% and 47% of the total intangible value after he accounted for domain names.[52]

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[52]For the domain name allocation, Mr. Franklyn calculated total 2005-2012 sales through the various European websites; allocated this revenue between the

(continued...)

Respondent's expert Mr. Haigh pointed out that Mr. Franklyn did not rely on any recognized valuation authority in devising his two methodologies and that his results were inconsistent with the conclusions that Deloitte had reached in the report mentioned supra p. 154. Using the trademark and domain values determined by Deloitte, Mr. Haigh estimated that only 30% of the overall value should be allocated to the European Portfolio. After adjusting the Deloitte results to eliminate what he regarded as double-counting of certain marks, Mr. Haigh opined that at most 25% of the overall value of the marketing intangibles should be allocated to the European Portfolio.

We conclude that respondent has the stronger side of this argument. Mr. Franklyn provided no theoretical or technical support for his "coexistence" model as a valuation technique. In every case of overlapping trademarks, that model allocated value 50-50 between the European and the US Portfolios, regardless of registration priority, Nice classifications claimed, and the relative strength of the registrants' competing claims. We find this approach to be arbitrary and unreliable.

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[52](...continued)
US and the European Portfolios based on ownership of the domain names; and weighted the trademarks at 75% and the domain names at 25%.

While Mr. Franklyn's "goods and services" model may have a firmer conceptual footing, we agree with respondent's critique of his implementation of this approach. First, it seems clear to us that Mr. Franklyn overweighted tier 1 and underweighted tier 3. He testified that he used the "rule of the mean" to allocate 75% of the total value to tier 1 and a mere 6.2% to tier 3. Respondent urges, and we agree, that this was little more than a guess and was not based on any recognized principles governing valuation of intellectual property.

Mr. Franklyn placed in tier 3 a total of 31 trademarks, the vast majority of which were owned by Amazon US. Nine of these marks were rated as "significant" by Deloitte. Mr. Haigh reasonably concluded that several other tier 3 marks, including "Amazon.com & Design" and the "Amazon Smile" logo, were likewise very important to Amazon's business. It seems clear to us that the tier 3 trademarks accounted for substantially more than 6.2% of the overall value.

We also find that Mr. Franklyn erred in allocating to the European Portfolio more than half the value of the tier 1 marks. Tier 1 comprised petitioner's three most important trademarks--"Amazon," "Amazon.com," and "Amazon and Design." In his "goods and services" model, Mr. Franklyn reasonably allocated 95% of the "Amazon.com" mark to the US Portfolio. But we think he erred in his treatment of the other two marks.

Amazon US and Amazon Germany both filed registrations for the "Amazon" mark. Amazon US had clear date priority, because its application was filed in 1996, whereas Amazon Germany's was not filed until 2000. Mr. Franklyn nevertheless allocated 85% of this trademark's value to the European Portfolio; he did so because Amazon Germany's application included Nice class 35, which was not among the three Nice classes that Amazon US had claimed four years previously. According to Mr. Franklyn, Nice class 35 covered "online retail sale of physical goods," from which the vast bulk of AEHT's revenues would be derived.

We find that Mr. Franklyn overemphasized the importance of the Nice classes, as compared to trademark date priority, and that he particularly erred in giving outsized importance to Nice class 35. In concluding that this class covered "online retail sale of physical goods," he relied on a definition of Nice class 35 that appears in the 2012 version of the Nice Classification. That version, representing the 10th edition of the Classification, postdates the registrations at issue by more than a decade.

In 1996 and 2000, when Amazon US and Amazon Germany respectively registered their overlapping "Amazon" marks, the 7th edition of the Nice Classification was in effect. It made no mention of eCommerce, websites, or online sales in its description of class 35, which was captioned "Advertising; business manage-

ment; business administration; office functions."[53] The eighth edition of the Nice Classification was in effect through 2007; it likewise does not mention eCommerce, websites, or online sales in the class 35 description.

Amazon US in 1996 registered the "Amazon" mark under Nice classes 9, 37, and 42. Those classes covered data processing equipment and computers, scientific and technological services, and the design and development of computer hardware and software. The trial testimony established that these classes were common selections for early online systems; Amazon's business was covered by, or at least analogous to, these classes. The seventh edition of the Nice Classification states that services not specifically covered by any class should be grouped by "analogy with other comparable services"; if a service could not otherwise be classified, it was "in principle classified in Class 42." Because Amazon US selected Nice class 42 when registering the "Amazon" trademark in 1996, and because it had four years of date priority over Amazon Germany's overlapping

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[53]Class 35 at the time did include "the bringing together, for the benefit of others, of a variety of goods (excluding the transport thereof), enabling customers to conveniently view and purchase those goods." Jorge Luis Contreras, one of respondent's experts, credibly testified that this language was interpreted to refer to "swap shops" and "flea markets" and that class 35 at the time "specifically exclude[d] the actual sale of the goods."

mark, we find that most or all of the value of the "Amazon" mark should be allocated to the US Portfolio.[54]

The third trademark that Mr. Franklyn put in tier 1 is "Amazon and Design." Amazon US and Amazon Germany filed European registration applications for this mark on the same day and under the same four Nice classes. Whereas Mr. Franklyn allocated 100% of the value of this mark to the European Portfolio, respondent's experts persuaded us that Amazon US and Amazon Germany both had very plausible claims. If we were to make an estimate under the Cohan rule, see Cohan v. Commissioner, 39 F.2d 540, 543-544 (2d Cir. 1930), we would allocate the value of this mark roughly equally between the European and the US Portfolios.

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[54]In his "coexistence" model, Mr. Franklyn rationalized allocating to the European Portfolio half the value of numerous trademarks, including the "Amazon" mark, under principles of "acquiescence." Under that doctrine, a trademark holder (such as Amazon US) can be divested of its trademark protection if it does not challenge an overlapping mark (such as that registered by Amazon Germany) within five years. Mr. Franklyn offered no authority to support the proposition that "acquiescence" would apply with full force inside a corporate group or that a parent corporation could be divested of trademark protection by an action taken by its subsidiary. In any event, even if "acquiescence" applied to the same corporate group, Amazon Germany did not register its "Amazon" mark until mid-2000, and the valuation here is being performed as of January 1, 2005, less than five years later. On January 1, 2005, Amazon US (or a hypothetical third party that had acquired the trademark from Amazon US) could still have challenged Amazon Germany's mark and potentially excluded Amazon Germany from using it.

In sum, we conclude that Mr. Franklyn made several errors that caused him to overstate significantly the value of the European Portfolio. He substantially undervalued the tier 3 marks, which were owned overwhelmingly by Amazon US, and he significantly over-allocated to the European Portfolio the value of the tier 1 marks. Moreover, there is no technical or evidentiary support for the 75%/18.8%/6.2% weighting he accorded the three tiers. Given these errors, we find that the best evidence available is Mr. Haigh's opinion: On the basis of his adjustments to Deloitte's findings, he determined that 25% of the overall value of the marketing intangibles should be allocated to the European Portfolio.[55] We accordingly conclude that this 25% portion must be excluded from the value of the marketing intangibles, as otherwise determined under this Opinion, when computing the appropriate buy-in payment.

C. Customer Information

The customer information that Amazon US made available to AEHT consisted of data about European retail customers who had transacted with the Euro-

[55]We have neither the data nor the ability to perform a precise "correction" of Mr. Franklyn's "goods and services" model to eliminate the errors discussed in the text and other errors of which respondent complains. However, if the bulk of the tier 1 trademark value were allocated to the US Portfolio as we think necessary, and if the tier 3 trademarks were given an appropriate heavier weighting (say 20% instead of 6.2%), we suspect that reasonable permutations of Mr. Franklyn's model would gravitate toward Mr. Haigh's 25% conclusion.

pean Subsidiaries before May 1, 2006. These data included names, email addresses, phone numbers, credit card information, and purchasing history. By making this information available to AEHT, Amazon US in effect was referring its existing European customers to AEHT and furnishing it with certain information about them.

The parties agree that the Associates and Syndicated Stores agreements between Amazon and its business partners provide useful internal CUTs for purposes of determining the fair market value of the customer information. Under those agreements, Amazon paid referral fees, in the form of "commissions," to a third party when the latter's customers or website visitors made purchases from Amazon. While concurring that these agreements supply useful data for valuing the customer information, the parties disagree about the mechanics of the valuation exercise.

Amazon had thousands of Associates agreements and more than 20 Syndicated Stores agreements with U.S. and European partners. The stated commission rates under both programs depended on product mix and sales volumes. Commission rates generally ranged from 4% to 8% in the Associates program and from 4% to 6% in the Syndicated Stores program. Referral fees for Syndicated Stores partners generally had a per-unit cap; this meant that the effective commis-

sion rate could be lower than the nominal rate reflected in the contract. The average referral fee Amazon actually paid under the Associates and Syndicated Stores programs was approximately 5.9% of referred sales.

Dr. Higinbotham examined two Syndicated Stores agreements and based his valuation principally on Amazon's contract with Waterstone's, a U.K. retailer. He explained that he focused on that contract because Waterstone's did business solely in an EU member state. He did not elaborate on the significance of this distinction or explain why it justified limiting his focus largely to this one contract.

The Waterstone's agreement provided for commissions ranging from 5% to 6% of referred sales. It also included a feature unique among the Syndicated Stores contracts: a one-time bounty of £7 for customers who clicked on a link embedded in certain promotional emails and subsequently made a purchase on an Amazon site. Dr. Higinbotham determined that people arriving at Amazon through a mirror site typically converted to direct Amazon customers within 90 days. He accordingly valued the customer information as the sum of: (1) a £7 bounty for each European customer that Amazon U.S. transferred to AEHT on May 1, 2006, and (2) a 6% commission computed on AEHT's total sales during the 90 days immediately following the May 1, 2006, business transfer. He thus derived a value of $214.5 million for the customer information.

At trial Dr. Higinbotham agreed that the Waterstone's contract was atypical and that Dr. Wills' analysis, which considered all the Associates and Syndicated Stores agreements, was more robust than his own. We agree on both counts. In his post-trial briefs respondent abandoned his reliance on Dr. Higinbotham's approach and instead proposed modifications to Dr. Wills' valuation methodology, to which we now turn.

Dr. Wills' first step was to determine an arm's-length referral fee. For this he used the weighted average of the actual commission rates paid under all Associates and Syndicated Stores agreements[56] in place for the European Subsidiaries during 2004-2006. (By using actual rates he accounted for cases where fee caps or similar provisions caused variance from the nominal rate.) He thus determined an average referral fee equal to 5.9% of referred sales. Respondent agrees that this reflects an accurate interpretation of the relevant data.

Dr. Wills' next step was to estimate the revenue stream to which this 5.9% referral fee should apply. In approaching this question, he noted that Amazon would pay a commission to an Associate only if the customer arrived directly from the Associate's site and made a purchase within 24 hours. Amazon was willing to

[56]Unless otherwise specified, subsequent references to the Associates program also include the Syndicated Stores program.

pay a large commission on this initial purchase because it was confident that the purchaser would soon become a direct Amazon customer, on whose future purchases no commissions would be due. Dr. Wills accordingly concluded that AEHT, operating at arm's length, would not pay referral fees to Amazon US on revenues derived from the initially referred European customers once those individuals had "converted" to AEHT customers and purchased items by coming directly to AEHT's sites. Dr. Higinbotham agreed with this proposition.

To ascertain the "conversion" rate, Dr. Wills relied on analyses performed by Dr. Moe and Mr. Wentland. Using Associates program data from January 2004 through April 2006, Dr. Moe analyzed subsequent spending by European customers who had originally arrived at an Amazon website via referral. To the extent these customers made future purchases by coming to an Amazon site directly, rather than by referral from a partner's site, she deemed them to have "converted."

Her analysis shows a very rapid rate of conversion, with 83.5% of referred customers becoming direct Amazon customers within one year. After eight years, only 10% of customers who had initially been referred from a partner's site continued to return to Amazon by referral, thus generating additional referral fees.

These additional fees, while less numerous, tended to be more lucrative because these customers spent above-average amounts on each Amazon shopping trip.

Dr. Wills concluded that the future revenue stream on which AEHT would have to pay referral fees equaled the sum of: (1) the initial purchases that the referred European customers made from AEHT and (2) subsequent purchases those individuals would make from AEHT upon referral from a mirror site rather than as "converted" AEHT customers. Dr. Moe's analysis provided an estimate of the median and average amounts that customers would spend, per visit to AEHT's sites, during the 10-year period following the business transfer. Dr. Wills used the median amounts in his analysis and concluded that AEHT, operating at arm's length, would agree to pay referral fees only for six years.

Combining the customer retention and conversion analyses with the median estimated spending per customer, Dr. Wills calculated the revenue that AEHT would derive from customers inherited from Amazon US who were expected to arrive at AEHT's websites by referral during the six years following the business transfer. Multiplying the estimated annual customer spending by the 5.9% referral fee and discounting this revenue stream at 18%, he opined that the arms-length buy-in payment for the customer information was $51.9 million.

Respondent challenges Dr. Wills' $51.9 million valuation on several grounds, the first of which concerns the cutoff date for paying referral fees. Dr. Wills acknowledged that there was a long "tail" of unconverted customers in the Associates program; indeed, 10% of customers initially referred from a partner's site continued to return to Amazon by referral eight years later. Dr. Wills admitted that there was no obvious "bright line" dictating when referral fees should stop. Although he had data from the Associates program going out 10 years, he opined that a term of 6 years would be generous.

We agree with respondent that Dr. Wills' selection of a truncated six-year period was arbitrary. Although he assumed that AEHT would refuse to pay for the long "tail" of customer referrals, Amazon did just that in its Associates program. There is no evidence that Amazon placed any cap on the length of time it was willing to pay commissions on purchases by customers who came to its websites by referral, even if those customers had previously purchased from Amazon directly. Since Dr. Wills had reliable data for 10 years, we conclude that the buy-in payment should reflect referral fees for that entire period. Dr. Wills performed this calculation and determined that the buy-in payment (holding all other aspects of his computation constant) would rise to $66.3 million if a 10-year cutoff were used.

Second, respondent contends that Dr. Wills understated the revenue stream for computing referral fees by using the median rather the average amounts that customers were expected to spend per visit. Dr. Moe's analysis showed that a small subset of customers was responsible for a disproportionate dollar amount of sales. Thus the average spending per customer was significantly higher than the median spending per customer.[57]

Dr. Wills testified that using the median was appropriate because using the average would likely overestimate future customer spending. Extrapolating customer spending out a decade resulted in a subset of customers with very high spending. Dr. Wills reasoned that customers would not increase their spending year after year indefinitely, and he used Dr. Moe's median figures to reduce the impact of outliers caused by the extrapolation.

Respondent's expert Dr. Wilcox opined that use of average spending was more appropriate. He noted that retailers often expect to earn a significant portion of their profits from a small subset of their customers. A desire to reduce the im-

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[57]A simplified example may illustrate this difference. Assume that 1,000 customers are referred to Amazon's website from mirror sites, with 900 making purchases of $20 and 100 making purchases of $100. The median spending per customer would be $20, but the average spending would be $28.

pact of high-spending customers, he opined, was not a sufficient justification for rejecting the use of average data.

We agree with Dr. Wilcox. High-spending customers are the customers a retailer most desires to have. We see no reason why AEHT, operating at arm's length, would insist on paying referral fees calculated to exclude these customers. Petitioner did not show that high-spending customers tend to "convert" to direct Amazon customers at a different rate from low-spending customers. Nor did petitioner offer any other persuasive reason for minimizing their impact on projected future revenue streams. Dr. Wills may be right that extrapolating customer spending out 10 years ultimately yields very high spending by the biggest hitters. But we do not find it illogical to assume that these fortunate individuals will keep spending more money each year. In any event, discounting out-year spending at 18% will tend to mitigate the effect of any distortion.

In his rebuttal report Dr. Wilcox revised Dr. Wills' calculations by using average spending levels and a 10-year cutoff for payment of referral fees. He thus derived a value of $129 million for the customer information. We find this to be the arm's-length buy-in payment for this group of intangibles.

Respondent contends that Dr. Wills' approach, even if modified as we have done above, does not capture the full value of Amazon's customer information.

Forrest Oswald, one of respondent's experts, opined that Dr. Wills erred by valuing solely the customer referral, rather than the complete universe of customer data (including purchase history, addresses, and credit card information) that Amazon US made available to AEHT. Mr. Oswald opined that the latter information would enable AEHT to provide a more streamlined and personalized user experience, even after the referred customers had become regular AEHT customers.

While Mr. Oswald is correct that Amazon's customer information had uses apart from customer referral, the trial established that this value had a very short life. Amazon US used customer information to power its "Similarities" and "Recommendations" software, as well as to improve the customer experience through one-click shopping and email marketing. But Amazon itself regarded this historical data as having limited utility; stored addresses and credit card information rapidly become outdated, and customers' buying habits change significantly over time. For its Similarities software, Amazon uses only relatively recent data because it regards older data as having little or no value. Indeed, older data may have negative value because they yield irrelevant or inappropriate recommendations.

Dr. Wilcox offered a different critique of Dr. Wills' approach by emphasizing the strength of Amazon's brand. The customer information that Amazon US

made available to AEHT concerned individuals who had previously purchased from Amazon. These customers presumably had a favorable opinion of Amazon; arguably, this "brand loyalty" would predispose them to keep patronizing AEHT. Dr. Wilcox urged that the customers thus referred were more valuable than the customers referred to Amazon through the Associates and Syndicated Stores programs, some of whom may never have visited an Amazon site previously.

We conclude that Dr. Wills' overall analysis adequately accounts for the strength of Amazon's brand. Although he looked to the Associates and Syndicated Stores agreements to derive an arm's-length commission rate, he used Amazon's experience to estimate customers' future spending. Those spending levels presumably reflect the value of Amazon's brand.

As discussed previously, customers' willingness to return to Amazon's websites depended chiefly on their satisfaction with Amazon's execution of the "three pillars," not on their impression of Amazon's "brand." See supra p. 12. Dr. Wills' methodology, in which Dr. Higinbotham ultimately concurred, reasonably captures the arm's-length value of the customer referrals that Amazon US made to AEHT. We conclude that any value associated with the customer information in excess of the value of customer referral was short-lived and immaterial or was adequately accounted for in Dr. Wills' valuation of the marketing intangibles and

website technology, on which the strength of Amazon's brand was based. We accordingly find that Dr. Wills' approach, as modified in the two respects discussed above, yields an appropriate arm's-length buy-in payment of $129 million for the customer information.

IV. Cost Sharing Payments

Where parties have entered into a QCSA, they share the cost of developing intangible property. A participant's "costs of developing intangibles * * * mean all of the costs incurred * * * related to the intangible development area." Sec. 1.482-7(d)(1), Income Tax Regs. "Costs incurred related to the intangible development area" generally consist of operating expenses (other than depreciation or amortization expense), plus charges for use of certain tangible property. Ibid. "If a particular cost contributes to the intangible development area and other areas or other business activities, the cost must be allocated between the intangible development area and the other areas or business activities on a reasonable basis." Ibid.

Once the total pool of IDCs is determined, these costs must be allocated to each QCSA participant "based on factors that can reasonably be expected to reflect that participant's share of anticipated benefits." Id. paras. (b)(2), (f)(1). In the CSA, Amazon US and AEHT used a revenue-based formula to determine their respective benefit shares. That formula is not in dispute.

What is in dispute is the total volume of IDCs that Amazon US incurred; the larger the volume, the larger the cost sharing payments that AEHT must make. The parties refer to this issue as the "cost pool" issue. For this issue, as for the issues discussed previously, we will uphold respondent's determination unless petitioner shows it to be arbitrary, capricious, or unreasonable. Seagate Tech., 102 T.C. at 164; Sundstrand Corp., 96 T.C. at 353.

A. Respondent's Position

Petitioner tracked expenses in six high-level cost centers: (1) Cost of Sales, (2) Fulfillment, (3) Marketing, (4) Technology and Content (T&C), (5) General and Administrative (G&A), and (6) Other. The parties agree that none of the costs accumulated in the "Cost of Sales" and "Other" categories are allocable to IDCs. Respondent accepts petitioner's formula-based allocation to IDCs of costs accumulated in the "Fulfillment" and "Marketing" categories, and he accepts petitioner's decision to allocate G&A costs to IDCs on the basis of the IDC outcomes for the other five categories.

The parties' dispute focuses on the T&C category. In the notice of deficiency respondent determined that 100% of the costs accumulated in T&C cost centers constitute IDCs. Petitioner challenges this determination, contending that these costs are "mixed costs," that is, costs that "contribute[] to the intangible

development area and other areas or other business activities." See sec. 1.482-7(d)(1), Income Tax Regs. According to petitioner, therefore, the regulations require that T&C category costs, like Fulfillment and Marketing costs, "be allocated between the intangible development area and the other areas or business activities on a reasonable basis." Ibid.

In May 2014 petitioner filed a motion for partial summary judgment on this issue. See Amazon.Com, Inc. & Subs. v. Commissioner, T.C. Memo. 2014-149, 108 T.C.M. (CCH) 87. We denied that motion, finding material facts in dispute at that time. Specifically, we ruled that, "[u]ntil petitioner establishes that the T&C category contains a nontrivial amount of 'mixed' costs, we cannot rule as to whether respondent abused his discretion in determining that 100% of T&C category costs constitute IDCs." 108 T.C.M. (CCH) at 88.

The evidence at trial established that T&C cost centers do indeed contain "mixed costs." Employees whose time was captured in T&C cost centers engaged in substantial non-IDC activities, such as helping vendors list their products on Amazon's websites, making minor adjustments to how website content is displayed, and managing third-party digital content that is viewed on or downloaded from Amazon.com. Some employees whose time was captured in T&C cost centers negotiated contracts with vendors and documented routine activities for them;

other employees were responsible for Sarbanes-Oxley compliance. Petitioner's SEC Form 10-K notes that T&C category costs included costs involved in "merchandising selection, category expansion and buying, and ordering products." These activities, when conducted by brick-and-mortar stores, are not likely to create intangible property.

Both parties' experts recognized that T&C category costs include mixed costs. Roman Weil, one of petitioner's experts, reached this conclusion on the basis of interviews with Amazon employees. Dr. Higinbotham, one of respondent's experts, agreed that substantial non-IDCs were accumulated in the T&C cost centers, and he used a modified version of petitioner's cost-allocation method when determining his buy-in payment for the website technology. Indeed, Dr. Higinbotham agreed that, if he were to treat 100% of T&C costs as IDCs as determined in the notice of deficiency, AEHT's future cost sharing payments would be so large as to produce a negative buy-in payment under his income method analysis.

Notwithstanding his expert's conclusions and trial testimony, respondent argues that petitioner cannot use an allocation methodology until it first establishes, on a cost-by-cost basis, which particular costs relate only partially to intangible development. We addressed this very point in our prior opinion, stating:

"It is not necessary that the parties painstakingly examine each cost in the 200-plus baseline cost centers in order to determine whether a nontrivial portion of T&C category costs are 'mixed.'" 108 T.C.M. (CCH) at 89. Respondent's audit team did not require this level of granularity when accepting petitioner's allocation method with respect to the Marketing and Fulfilment categories. We see no logical reason for imposing harsher requirements on petitioner before allowing it to allocate costs within the T&C category.[58]

In sum, we agree with petitioner that respondent abused his discretion in determining that 100% of the costs accumulated in the T&C cost centers constitute IDCs. Petitioner has established through documentary evidence and expert testimony that substantial non-IDCs were captured in these cost centers. By deeming 100% of T&C category costs to be IDCs, respondent's position as set out in the notice of deficiency violates the regulatory command that "[c]osts that do not contribute to the intangible development area are not taken into account." Sec. 1.482-7(d)(1), Income Tax Regs.

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[58]Respondent's position would apparently require evaluation of 500 general-ledger accounts and 100 general-ledger account rollups for each of the T&C cost centers. Because petitioner had between 162 and 221 T&C cost centers during 2005 and 2006, this would necessitate several hundred thousand discrete evaluations. This would plainly be overkill; the regulations require only that the allocation be made "on a reasonable basis." Sec. 1.482-7(d)(1), Income Tax Regs.

B. Petitioner's Position

We have described supra pp. 62-65 the methodology petitioner used for 2006, and urges here, for determining the subset of T&C category costs properly allocable to IDCs. Respondent's expert, Dr. Higinbotham, examined this methodology carefully when preparing his expert report. Under his income method, he was required to estimate petitioner's future IDCs in order to calculate a buy-in price for the website technology. He therefore needed to employ a method for allocating costs to IDCs. He spent a "significant amount of time" developing an appropriate method, because his ultimate conclusion necessarily depended on the IDCs' being calculated properly.

In estimating future IDCs, Dr. Higinbotham used petitioner's allocation methodology, as described above, with two significant modifications. Petitioner has accepted the cost-pool results thus reached by Dr. Higinbotham, with one further adjustment (discussed below) to which Dr. Higinbotham assented at trial. We agree with Dr. Higinbotham's two modifications subject to this further adjustment, and we reject respondent's contention that further modifications are required.[59]

[59]Respondent argues that Dr. Higinbotham, when preparing his expert reports, did not have enough evidence to decide upon an accurate allocation method. (continued...)

Dr. Higinbotham's first adjustment concerned petitioner's use of the "T-ratio." Using the QRE survey results compiled by PwC, petitioner determined an "adjusted QRE percentage" or "A-ratio" for each person who recorded time in T&C cost centers. Petitioner multiplied this "A-ratio" by the applicable "T-ratio" to yield a "development ratio" for the T&C category. See supra p. 64. Petitioner then multiplied "modified T&C category costs" (as determined previously) by the "development ratio" to determine the dollar volume of T&C category costs properly allocable to IDCs.

Dr. Higinbotham opined that petitioner's insertion of the "T-ratio" into this calculus artificially diluted the cost allocation to IDCs. Petitioner derived the "T-ratio" by dividing the number of T-coded employees in the T&C category by the total number of employees in that category. Petitioner added this step to its allocation formula on the assumption that only T-coded employees were likely to engage in intangible development activity.

We agree with Dr. Higinbotham in rejecting this assumption. During 2005-2006 there were almost as many T&C cost centers with no T-coded employees as

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[59](...continued)
But the parties conducted very extensive discovery in this case; if Dr. Higinbotham believed he lacked certain necessary information, respondent was free to request it. In any event, respondent stands behind Dr. Higinbotham's ultimate conclusion, which necessarily includes his underlying calculations.

with all T-coded employees. In compiling its data, PwC surveyed most employees who recorded time to T&C cost centers, regardless of their job classifications, and it computed a QRE percentage for each employee thus surveyed. Since there were non-T-coded employees whose efforts directly or indirectly furthered intangible development, the use of the T-ratio resulted in understating petitioner's IDCs.[60]

To remedy this flaw, Dr. Higinbotham significantly reduced or eliminated the role of the T-ratio. For cost centers in the 7000 series, he set the T-ratio at 100%, effectively eliminating it. He did the same for cost centers in the 5000 series with at least an 80% response rate to the QRE survey and for certain other 5000-series cost centers with "a logic behind doing it." For the remaining 5000-series cost centers, he assigned the same T-ratio that Amazon had assigned, but made modifications to better capture the cost of interns as if they were T-coded employees. Dr. Higinbotham described these adjustments as his "most important" change to petitioner's cost-allocation formula. Petitioner has accepted all of these adjustments, and we find them to be appropriate.

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[60]A corollary to this flaw was the exclusion of time spent by paid interns. They completed QRE surveys and recorded time to T&C cost centers, but they did not have a T-coded job classification. Use of the T-ratio effectively eliminated their time from the cost pool even if they did 100% intangible development.

Dr. Higinbotham's second adjustment to petitioner's formula involved the treatment of certain indirect costs. The QRE survey data compiled by PwC captured time devoted to "direct supervision and support" of qualifying research activity. However, petitioner's formula did not capture the costs of "indirect supervision" (e.g., time spent by a higher level supervisor) or "indirect support" (e.g., time spent by a supervisor's executive assistant). Because the CSA defined IDCs to include "all direct and indirect costs" of intangible development, Dr. Higinbotham concluded that an additional modification to petitioner's cost-allocation formula was necessary.

To implement this modification, Dr. Higinbotham recalculated the A-ratio for employees in the T&C category. He did this chiefly by reallocating to IDCs a portion of the time that employees had reported on their QRE surveys as spent on "human resources/training," which PwC had excluded for section 41 credit purposes. The impact of this adjustment was to increase the A-Ratio for certain individuals and the corresponding A-ratio for the cost center in which those individuals were assigned. Petitioner has accepted this adjustment, and we find it to be appropriate.

These two modifications by Dr. Higinbotham were significant, increasing petitioner's IDCs by more than $50 million for each year at issue. At trial Dr.

Higinbotham agreed with Dr. Weil that, whereas salary weighting was appropriately applied to employee costs, headcount weighting was more appropriately applied to the remaining costs. This further adjustment reduced Dr. Higinbotham's results by $3 million and $5 million for 2005 and 2006, respectively. We conclude that Dr. Higinbotham's results, as thus adjusted, yield a formula that allocates costs "between the intangible development area and the other areas or business activities on a reasonable basis." Sec. 1.482-7(d)(1), Income Tax Regs.

We do not accept three further modifications to petitioner's allocation formula that respondent has urged at various times. First, in the notice of deficiency respondent contended that petitioner erred in eliminating from the T&C cost centers all costs captured in 26 general ledger accounts that petitioner deemed unrelated to intangible development. See supra p. 63. Examples of the eliminated accounts include 64168 (Pallet Expense), 64712 (Warehouse Supplies), 64715 (Safety Supplies), 64331 (Depreciation: Heavy Equipment), and 64332 (Depreciation: Vehicles). Drs. Weil and Higinbotham agreed that it was reasonable to exclude from IDCs the costs captured in these accounts solely on the basis of the account description, without investigating the subsidiary costs in detail. Respondent in his post-trial briefs largely abandoned any challenge to this conclusion, which we believe to be correct.

Second, respondent urges a further adjustment to the PWC survey data. Petitioner recognized that certain costs ineligible for the section 41 credit may nevertheless constitute IDCs. Petitioner accordingly added back two types of costs reflected on the QRE survey forms--"reverse engineering" costs and costs of non-U.S. activities--that are ineligible for the R&E credit. Respondent contends that two other types of costs--those of "routine engineering" and "routine data collection"--should also be added back for purposes of determining the IDCs pool.

Neither Dr. Weil nor Dr. Higinbotham believed that these two species of costs should be added back. In support of a contrary view, respondent points to an example in the regulations indicating that "field testing costs" for a new invention may constitute IDCs that must be shared. See sec. 1.482-7(d)(3), Example (2), Income Tax Regs. We find this analogy inapposite. The costs of field testing a new invention are not comparable to costs of routine data collection and routine engineering. Petitioner agrees that field testing new software generates IDCs and notes that the QRE survey properly captured such costs.[61]

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[61]Petitioner's version of field testing is called Weblabs. The QRE survey administered by PwC required employees to report such activity under category 5, captioned: "Testing: Design and execution of plans to test the concepts and software. Includes code sequence testing, unit testing, system testing, and the use of Weblabs. Also involves redesign and re-testing as a result of initial testing results."

Finally, respondent challenges the reliability of the PwC survey data, noting that petitioner's employees did not record their time contemporaneously. While we agree that contemporaneous time records are always preferable, PwC apparently secured its data within a year of the periods in which the employees rendered their services. The regulations required petitioner to devise a formula that would allocate costs "on a reasonable basis," id. subpara. (1), and we think petitioner acted logically in using the best data it had.

For purposes of claiming section 41 credits, it was in petitioner's interest to have its employees show the highest possible percentage of their time as allocable to R&E activities. All time allocated to R&E activities in the QRE surveys will necessarily be allocated to IDCs. To the extent that petitioner's employees, lacking contemporaneous time records, made approximations in reporting how their time was spent, it seems unlikely that the results, as applied here, would be biased in petitioner's favor.

In sum, we conclude that petitioner's cost-allocation methodology, as adjusted by Dr. Higinbotham and further modified by him at trial, yields a formula that allocates costs "between the intangible development area and the other areas or business activities on a reasonable basis." Sec. 1.482-7(d)(1), Income Tax Regs. Dr. Higinbotham needed an accurate allocation methodology for his own

valuation exercise, and he carefully considered and modified petitioner's formula for this purpose. Petitioner accepts that result, and so do we.[62]

C. Stock-Based Compensation

The CSA executed by Amazon US and AEHT defined IDCs to "include all direct and indirect costs (including Stock-Based Compensation Costs)" relating to intangible development. The parties further elected to take into account "all stock-based compensation in the form of stock options in the same amount, and as of the same time, as the fair value of the stock options reflected as a charge against income" in either party's financial statements. Id. subpara. (2)(iii)(B). This election was made "without prejudice to the Party's right to challenge the validity" of the regulation.

In filing its 2005 and 2006 returns, petitioner thus complied with the regulation requiring that stock-based compensation be included in the cost pool. Like many technology companies, petitioner questioned the validity of this regulation.

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[62]Respondent notes that the regulation requiring costs to be allocated "on a reasonable basis" states, in the next sentence, that "it is necessary to estimate the total benefits attributable to the cost incurred." Sec. 1.482-7(d)(1), Income Tax Regs. While urging that petitioner has not satisfied the latter requirement, respondent has not advanced a coherent theory as to how a taxpayer would go about estimating the "total benefits" attributable to costs accumulated within each of several thousand cost centers. We conclude that a properly constructed allocation formula, such as that approved in the text, will accomplish the desired result in petitioner's case.

The CSA accordingly included a "clawback" provision that will apply in the event section 1.482-7(d)(2), Income Tax Regs., is

> held to be an invalid regulation by a final decision in a court of law with respect to pending litigation involving another taxpayer, including a U.S. Supreme Court decision, U.S. Court of Appeals decision upon denial of a writ of certiorari or lapse of time for filing such writ, or a decision by a federal trial court upon lapse of time for filing a notice of appeal, or * * * [is] revised or withdrawn by the Treasury Department such that the costs of stock-based compensation are not required to be included as costs for qualified cost sharing arrangements.

In the event this regulation is ultimately invalidated or withdrawn, the CSA provides that "stock-based compensation shall not be included in the determination of * * * [IDCs] in any Year to which this Agreement applies." For any year for which stock-based compensation turns out to have been "improperly" included in IDCs, "the Cost Share shall be recomputed without the inclusion of stock-based compensation in [IDCs]," and "the Cost Share less the Recomputed Cost Share shall be refunded [to the proper party]." The CSA provides that any such refund shall be "treated as an adjustment to the Cost Share for the Year in which the Triggering Event occurs * * *, and to the extent that such adjustment exceeds the Cost Share, the adjustment shall be applied to subsequent Years until fully exhausted."

In Altera Corp. v. Commissioner, 145 T.C. 91, this Court invalidated section 1.482-7(d)(2), Income Tax Regs., the provision that requires stock-based compensation costs to be included in the IDC pool. Our decision in that case was appealed to the U.S. Court of Appeals for the Ninth Circuit on February 19, 2016. The case remains pending on appeal, and the CSA's clawback provision is not yet operative.

The parties agree that the CSA is a "qualified cost sharing arrangement." This agreement requires petitioner to adhere to section 1.482-7(d)(2), Income Tax Regs., until such time as that regulation is withdrawn by the Department of the Treasury or finally invalidated by judicial decree. If and when either of those "Triggering Events" occurs, the CSA states that appropriate adjustments will be made to the parties' respective cost shares in the relevant future years. Because there is no scenario in which an adjustment would be required to AEHT's cost sharing obligation for 2005 or 2006, the years before the Court, we conclude that both petitioner on its original returns and respondent in the notice of deficiency correctly included stock-based compensation in the cost pool.

To implement the foregoing,

Decision will be entered under Rule 155.

APPENDIX

Petitioner's Expert Witnesses

1. Lorenzo Alvisi

Dr. Alvisi is a professor of computer science at the University of Texas at Austin. He received his undergraduate degree in physics from the University of Bologna and his M.S. and Ph.D. in computer science from Cornell University. He has been a visiting professor at various institutions around the world, including schools in Italy, China, Germany, and the United States. His research has focused on security issues in computer systems. He has written 21 published articles in addition to book chapters and conference papers relating to the security of computer systems. For purposes of this case, he co-drafted a report with Ken Birman regarding the useful life of Amazon's eCommerce software technologies and retail websites. However he did not testify at trial.

2. Ken Birman

Dr. Birman is a professor of computer science at Cornell University. His research has focused on distributed computing, fault tolerance, security, and scalability. He received his B.A. in computer science from Columbia University and his M.S. and Ph.D. in computer science from the University of California, Berkeley. In addition to teaching, he has founded three companies in the comput-

ing systems space and has written 150 research papers and 5 books in the field of computer science. For purposes of this case, he co-drafted a report with Lorenzo Alvisi regarding the useful life of Amazon's eCommerce software technologies and retail websites. The Court recognized Dr. Birman as an expert in computer science.

3. Bradford Cornell

Dr. Cornell holds a Ph.D. in financial economics and is a visiting professor of financial economics at the California Institute of Technology. He received his A.B. in physics, philosophy, and psychology from Stanford University, his M.S. in statistics from Stanford, and his Ph.D. in financial economics from Stanford. His work and research has focused on financial economics and valuation. He has published over 100 articles focused on the practical and empirical applications of financial economic theory. Part of his research focuses exclusively on technology companies. He has also served as the vice president and director of securities litigation group for the Economic Analysis Corporation, a senior consultant for CRA and Compass Lexecon, and a managing director for San Marino Business Partners. The Court recognized Dr. Cornell as an expert in financial economics and valuation.

4. Robert Dolan

Dr. Dolan is a Baker Foundation professor of business administration at Harvard Business School. He received his B.A. in mathematics from Boston College and an M.B.A. and a Ph.D. in business administration from the University of Rochester in New York. He previously taught at the University of Michigan Stephen M. Ross School of Business and the University of Chicago Graduate School of Business. He has extensive teaching and consulting experience in the areas of customer purchasing decisions and building brand awareness. He has published numerous books and articles on marketing, product pricing, and brands. The Court recognized Dr. Dolan as an expert in marketing.

5. David Franklyn

Professor Franklyn is a professor of intellectual property law at the University of San Francisco School of Law. He received his B.A. in history, philosophy, and religion from Evangel College and his J.D. from the University of Michigan Law School. He is also the executive director of the McCarthy Institute for Intellectual Property and Technology Law at the University of San Francisco and the director of the Center for Empirical Study of Trademark Law at the McCarthy Institute. He has experience working as a consultant, advising companies on issues relating to trademarks and management of trademark portfolios. He is also the co-

author and editor in chief of McCarthy's Desk Encyclopedia of Intellectual Property, and he has written numerous articles on trademark law. The Court recognized Professor Franklyn as an expert in international trademark law and empirical evaluation of trademarks.

6. Peter Golder

Dr. Golder is a professor of marketing at Tuck School of Business at Dartmouth College. He received his B.S. in mechanical engineering from the University of Pennsylvania and his Ph.D. in business administration (marketing) from the University of Southern California. Before teaching at Dartmouth, he taught at the Stern School at New York University. His research and publications focus on the history of markets and brands, specifically on using the historical method to remove survival bias from marketing analyses, global marketing, and product life cycles. The Court recognized Dr. Golder as an expert in marketing, market leadership, duration, and survival time.

7. Marco Iansiti

Dr. Iansiti is the David Sarnoff Professor of Business Administration at Harvard Business School. He holds an A.B. in physics and a Ph.D. in physics from Harvard University and has taught there for over 25 years, where he was the first faculty member to focus on the computer industry. His research focuses on

innovation of the Internet and technology companies. In addition to teaching and researching, Dr. Iansiti is an eCommerce entrepreneur, founding Model N, an eCommerce technology provider, and a technology strategy consultant, founding Keystone Strategy, a consulting firm providing both business and litigation-related technology advice. The Court recognized Dr. Iansiti as an expert in innovation and eCommerce technology.

8. Michael Lasinski

Mr. Lasinski is a managing director and chief executive officer of 284 Partners, LLC, an intellectual property valuation, strategy, consulting, and transactional firm. He holds a B.S. in electrical engineering and an M.B.A. from the University of Michigan. He is also a certified public accountant with a special certification in financial forensics. He has worked in intellectual property for approximately 20 years. He was formerly the president at the Licensing Executives Society of the United States and Canada. Mr. Lasinski's work has focused primarily on reviewing and analyzing hundreds of intellectual property license agreements. He has reviewed thousands of license agreements and has negotiated between 50 and 100 license agreements. The Court recognized Mr. Lasinski as an expert in intellectual-property licensing.

9. Alan MacCormack

Dr. MacCormack is an adjunct professor of business administration at Harvard Business School. He received his B.S. in electrical and electronic engineering from the University of Bath in England, an M.S. in management from the MIT Sloan School of Management, and a Ph.D. in business administration from the Harvard Business School. His work has focused on analyzing software systems and software releases. He has written 30 to 40 publications analyzing software development processes and software architecture and has received awards for papers on the topics of software development and design. He has applied his analyses to his consulting work for numerous large companies. The Court recognized Dr. MacCormack as an expert in the management of innovation, the management of technology and new product development, including the software industry, and the management and evaluation of software code, architecture, and evolution.

10. Haim Mendelson

Dr. Mendelson is the Kleiner Perkins Caufield & Byers professor of electronic business and commerce and management at the Stanford Graduate School of Business. He previously taught business administration at the University of Rochester. He received his B.S. in mathematics and physics from Hebrew University in Jerusalem, his M.S. in management sciences from Tel Aviv University,

and his Ph.D. in mathematical sciences from Tel Aviv University. A scholar of eCommerce, he has written a number of case studies on eCommerce companies and brick-and-mortar retailers with an online channel. He has also helped build Internet and eCommerce companies both as a professor assisting student entrepreneurs and as a paid adviser. The Court recognized Dr. Mendelson as an expert in electronic business.

11. David Parkes

Dr. Parkes is the area dean for computer science and the George F. Colony Professor of Computer Science and Harvard College Professor at Harvard University. He received his master's degree in engineering and computer science from Oxford University and a Ph.D. in computer and information science from the University of Pennsylvania. He teaches courses related to eCommerce, artificial intelligence, machine learning, multi-agent systems, and economics at Harvard. He is currently the chair of the ACM Special Interest Group on Electronic Commerce, the leading computer eCommerce professional organization. He also serves as the chair of the ACM Special Interest Group on Electronic Commerce and has published over 80 papers related to eCommerce. The Court recognized Dr. Parkes as an expert in computer science and eCommerce technology.

12. Robert Reilly

Mr. Reilly is a managing director of Willamette Management Associates, a firm that provides financial advisory services relating to business and intangible asset valuation. He received his B.A. in economics and his M.B.A. in finance from Columbia University. He was previously a partner and national director at Deloitte and Touche, vice president of Arthur D. Little Valuation, Inc., a valuation services firm, director of corporate development for Huffy Corporation, and a senior consultant for Booz, Allen & Hamilton. He has published 12 valuation textbooks and over 300 journal articles in the field of valuation. He has also valued trademarks over 500 times. The Court recognized Mr. Reilly as an expert in valuation.

13. James Roper

Mr. Roper is the chairman and founder of the Interactive Media in Retail Group (IMRG), a United Kingdom eCommerce industry association. During his time at IMRG, Mr. Roper has advised governments about eCommerce and given numerous presentations on eCommerce. He previously worked as a business development director for New Media Productions and Convergent Communications. The Court recognized Mr. Roper as an expert in eCommerce.

14. Sanjay Unni

Dr. Unni holds a Ph.D. in economics and is currently the director of the Berkeley Research Group, an expert services firm specializing in economics and financial analysis. He received his B.A. in economics from the University of Delhi in India and his master's degree and Ph.D. in economics from Southern Methodist University. He previously served as the director in the securities practice of LECG, another expert services firm. He has also taught courses on corporate finance, investment analysis, market structures, and finance at several institutions in the United States and the United Kingdom. As a transfer pricing economist he has drafted more than 30 transfer pricing reports, primarily related to technology firms. He has also published and taught in the field of financial economics. The Court recognized Dr. Unni as an expert in economics, financial economics, and transfer-pricing economics.

15. Roman Weil

Dr. Weil holds a Ph.D. in economics and is currently the V. Duane Rath professor emeritus of accounting at the Chicago Booth School of Business. He received his B.A. in economics and mathematics from Yale University and his M.S. in industrial administration and a Ph.D. in economics from Carnegie Mellon University. He has served on the faculties of nearly a dozen other schools, including

as a visiting professor of accounting at the Rady School of Management at the University of California San Diego. He has also served on the Financial Accounting Standards Advisory Council and the Public Company Accounting Oversight Board. He has focused his research on accounting and has written numerous books and articles on cost accounting. The Court recognized Dr. Weil as an expert in cost accounting.

16. Robert Wentland

Mr. Wentland is a managing director at Navigant Consulting. He received his B.B.A. in accounting from the University of Wisconsin Madison. He is a C.P.A. and is also certified by the AICPA in financial forensics. He previously worked for Arthur Anderson as an accounting and consulting partner and for Huron Consulting as a Managing Director. Mr. Wentland has provided forensic accounting and data analysis services related to international tax controversies, including transfer pricing disputes, for nearly 20 years. The Court recognized Mr. Wentland as an expert in financial statement analysis and forensic accounting.

17. Robert Willig

Dr. Willig holds a Ph.D. in economics and is a professor of economics and public affairs at Princeton University. He received his A.B. in mathematics from Harvard University, his M.S. in operations research from Stanford University, and

his Ph.D. in economics from Stanford. While teaching at Princeton, he also served as a principal external advisor at the Inter-American Development Bank, a Deputy Assistant Attorney General at the U.S. Department of Justice, and a supervisor at Bell Laboratories, among other consulting roles. His research and publications focus on asset decay, how markets work, how markets influence economic outcomes, and how the forces of economics affect the marketplace. The Court recognized Professor Willig as an expert in microeconomics.

18. John Wills

Dr. Wills holds a Ph.D. in economics and is the principal of Wills Consulting, a consulting firm specializing in transfer pricing economics. He received his B.A. in economics from Claremont Men's College (now Claremont McKenna College) and his M.A. and Ph.D. in economics from the University of Washington. He was previously the head of Ernst & Young's transfer pricing practice in the Western region of the United States, an economist in Deloitte & Touche's National Tax Office, and a Legislative Assistant at the United States Senate. He has worked in transfer pricing economics for more than 25 years. Most of his work has focused on transfer pricing associated with technology companies, particularly intangibles transactions and cost-sharing arrangements. The Court recognized Dr. Wills as an expert in economics and transfer pricing economics.

Respondent's Expert Witnesses

1. Geoff A. Cohen

Dr. Cohen is a computer scientist at Elysium Digital LLC where he is a technical consultant to firms and government agencies involved in computer-science-related litigation. He received his A.B. from Princeton University and his Ph.D. in computer science from Duke University. Before working at Elysium, he was a principal at Coherence Engine and a senior consultant and manager at the Cap Gemini Ernst & Young Center for Business Innovation. He was also a consultant at the National Research Council, where he assisted in the research for and production of a report on the intersection of computer science and biology. He has published extensively in the area of computer science. The Court recognized Dr. Cohen as an expert in computer science and software.

2. James G. Conley

Dr. Conley is a marketing professor at the Kellogg School of Management and an engineering professor at the McCormack School of Engineering at Northwestern University where he teaches innovation process management and intellectual capital management. He received his B.S. in nuclear engineering from the University of Virginia and his master's in management and Ph.D. in materials science and engineering from Northwestern University. He is also a director at the

Global Economics Group LLC. He was previously a principal at Chicago Partners, an intellectual capital management and litigation consulting firm, and a founder of Syndia Corporation, a product development and intellectual property licensing firm. He was also an appointed member of the Trademark Public Advisory Committee to the U.S. Patent and Trademark Office. He has researched and published extensively in the areas of intellectual property management and process management. The Court recognized Dr. Conley as an expert in intellectual property management.

3. Jorge Luis Contreras

Professor Contreras is an intellectual property law professor at the American University, Washington College of Law and the founder of Contreras Legal Strategy, LLC, a boutique legal advisory firm. He received his B.A. in English and B.S. in electrical engineering from Rice University and his J.D. from Harvard Law School. He was previously an associate and partner at Wilmer, Cutler, Pickering, Hale, and Dorr LLP where he advised clients on transactions involving intellectual property, including licensing, technology development, and product manufacturing, distribution, and sale. He has published extensively in the areas of intellectual property, technology licensing, technical standards, patent litigation, and regula-

tion of science. The Court recognized him as an expert in U.S. and foreign intellectual property law, domain name law, and intellectual property licensing.

4. Edward W. Felten

Dr. Felten is the director of the Center for Information Technology Policy and the Robert E. Kahn professor of computer science and public affairs at Princeton University. He received his B.S. in physics from the California Institute of Technology and his M.S. and Ph.D. in computer science and engineering from the University of Washington. He has held numerous other positions in the area of computer science, including chief technologist at the Federal Trade Commission, consulting computer scientist at Elysium Digital LLC, and consultant at Electronic Frontier Foundation, in addition to serving on various advisory and consulting boards. He has written two books and over 100 articles relating to computer science and intellectual property policy. The Court recognized Dr. Felten as an expert in computer science.

5. Daniel J. Frisch

Dr. Frisch holds a Ph.D. in economics specializing in transfer pricing analysis and is the managing director at Horst Frisch, Incorporated, an independent economics consulting firm. He received his A.B., M.A., and Ph.D. in economics from Harvard University. He previously worked as a principal at KPMG Peat

Marwick and as a director for international taxation and international economist at the U.S. Treasury Department's Office of Tax Analysis. He also worked as a senior staff economist at the Council of Economic Advisers and an assistant professor of economics at the University of Washington in Seattle. His practice has focused on consulting for U.S. and foreign multinational companies with regard to transfer pricing policies. He has published extensively in the area of transfer pricing. The Court recognized Dr. Frisch as an expert in economics and transfer pricing.

6. Paul A. Gompers

Dr. Gompers is the administration and faculty chair of the elective curriculum at the Harvard University Graduate School of Business Administration. He received his A.B. in biology from Harvard College, his M.Sc. in economics from Oxford University, and his Ph.D. in business economics from Harvard University. He has researched and written extensively in the areas of venture capital, private equity industries, and entrepreneurial finance. He has also served as a consultant and adviser to numerous companies with regard to fundraising, future projections, investments, and valuation. The Court recognized Dr. Gompers as an expert in financial economics, valuation of businesses and assets, private equity, and entrepreneurial finance.

7. David Haigh

Mr. Haigh is a chief executive at Brand Finance, a United Kingdom brand consultancy firm specializing in brand valuation, evaluation, research, and strategy. He received his B.A. in English literature from Bristol University. He thereafter joined PwC as an auditor and later worked as a management consultant. While there he became qualified as a chartered accountant. After leaving PwC he worked as a consultant at various firms during which time he earned a post-graduate diploma in marketing. He has written extensively on brand valuation and brand strategy and has also lectured on the subjects at schools in the United States, the United Kingdom, Singapore, and Switzerland. The Court recognized him as an expert in brand evaluation and brand valuation.

8. Harlow Higinbotham

Dr. Higinbotham holds a Ph.D. in economics and is a chartered financial analyst currently serving as the senior vice president of National Economic Research Associates (NERA). He received his A.B. in applied mathematics from Harvard University, completed graduate studies at the London School of Economics, and received his Ph.D. in economics from the University of Chicago. Before joining NERA, he served as A.T. Kearney's chief economist, leading its transfer pricing practice. He has published extensively on transfer pricing and has also

served as an expert witness in prior proceedings related to cost determination. The Court recognized him as an expert in transfer pricing.

9. Thomas Hoeren

Professor Hoeren is a foreign intellectual property law professor at the University of Münster in Germany. He received his first degree in theology and philosophy, his doctorate in theology, and a law degree from the University of Münster. He has been a professor in intellectual property law for over 20 years, lecturing at universities around the world. He has written extensively on intellectual property and trademark law. The Court recognized him as an expert in trademark law, domain name law, and intellectual property.

10. Forrest Oswald

Mr. Oswald is a senior IRS economist in the transfer pricing practice group. He received his B.A. in economics and a minor in mathematics from Pepperdine University. Before working at the IRS, he worked for KPMG and FTI Consulting in their transfer pricing groups. He has participated in transfer pricing evaluations for various intercompany transactions, including intellectual property, services, goods, and loans, and for a variety of industries, including retail, software, financial services, automotive, and entertainment. The Court recognized Mr. Oswald as an expert in transfer pricing and valuation.

11. Jim Timmins

Mr. Timmins is an investment banker and valuation analyst and currently the managing director of Teknos, a financial services advisory firm focused on technology-driven businesses. He received his B.A. from Trinity College, University of Toronto and an M.B.A. from the Stanford University Graduate School of Business. Before joining Teknos, he was a managing director of Pagemill Partners (now a Duff & Phelps Business), an investment bank, managing director of the Daiwa Securities Group, NIF Ventures (now NIF Sumitomo Mitsui Banking Corporation Ventures), and a general partner of the venture capital firms Glenwood Ventures and Glenwood Capital. He has provided valuation services, venture capital investing, and investment banking services to hundreds of companies for more than 30 years. The Court recognized Mr. Timmins as an expert in valuation.

12. Ronald T. Wilcox

Dr. Wilcox holds a Ph.D. in economics, is the Ethyl Corporation professor of business administration at the University of Virginia's Darden School of Business, and associate dean of the M.B.A. for executives program at Darden. He received his B.A. in economics from Xavier University and his Ph.D. in business administration from Washington University in St. Louis. Before Darden, he was

an assistant professor of industrial administration at the Graduate School of Industrial Administration (now Tepper School of Business) at Carnegie Mellon University. He was also an economist at the U.S. Securities and Exchange Commission from 1999 to 2000, in addition to serving as a marketing consultant for various organizations. He has published extensively on the topic of marketing. The Court recognized Dr. Wilcox as an expert in marketing, marketing modeling, and consumer behavior.