The OECD's Unified Approach — An Analysis of the Revised Regime for Taxing Rights and Income Allocation

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In this article, the authors analyze the impact of the OECD's proposed consensus framework to shape the international allocation of global taxing rights and multinationals' taxable income as part of the organization's project to address the tax challenges of the digitalization of the economy.

I. Introduction

For almost 100 years, the international allocation of taxing rights and the taxation of multinational enterprises have relied on the permanent establishment concept and the arm's-length principle. By December 2020, the centrality of those concepts to the international tax system is likely to change. That target date was set by the OECD inclusive framework on base erosion and profit shifting, which is spearheading the reshaping of the consensus-based regime of international taxation as part of a project whose original objective was "addressing the tax challenges of the digitalisation of the economy."[1] The project is commonly referred to as "BEPS 2.0,"

given how soon it followed on the heels of the original BEPS project launched in 2013.[2]

Pillar 1 of the BEPS 2.0 project covers the development of new nexus and profit allocation rules that will determine when a jurisdiction has the right to tax an MNE's income and how much of that income it can tax. The new rules will supplement and, in some situations, possibly override existing rules.

The December 2020 timeline for a final pillar 1 outcome was reinforced in a consultation document released October 9, 2019, by the OECD secretariat.[3] That document outlines a unified approach that contains a new concept of nexus together with new income allocation rules applicable to market countries, defined as the locations of consumers and users of an MNE's products and services. The new concept of nexus is independent of physical presence in a jurisdiction (the definitive requirement for a PE under current rules).

This article has two purposes. The first is to present a framework to analyze the impact of the proposed nexus and income allocation rules, which will work in parallel with and in addition to existing nexus and income allocation rules. Second, it uses the framework to perform a quantitative impact analysis using aggregated and anonymized data from country-by-country reports filed by (primarily) U.S.-headquartered MNEs with the IRS for fiscal 2016. It defines and estimates two indices intended to measure the

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[1] OECD, "Addressing the Tax Challenges of the Digitalisation of the Economy — Public Consultation Document" (Feb. 2019); and "Programme of Work to Develop a Consensus Solution to the Tax Challenges Arising From the Digitalisation of the Economy" (May 2019).

[2] OECD, Action Plan on Base Erosion and Profit Shifting (2013).

[3] OECD, "Secretariat Proposal for a 'Unified Approach' Under Pillar One — Public Consultation Document" (Oct. 2019). The consultation document clarifies that its proposals do not represent the consensus views of the inclusive framework or the Committee on Fiscal Affairs.

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extent of change the unified approach will bring about.

The relevant data are reported by the IRS's Statistics of Income (SOI) division. In particular, our analysis covers several broad topics.[4] First, we try to quantify how much of the global taxable income of MNEs in a given industry will be covered — and its allocation governed — by the rules of the unified approach that differ from existing rules grounded in the PE concept and the arm's-length principle. We call the estimate of the income that will have its cross-border allocation for income tax purposes will be governed by the rules of the unified approach "unified approach scope income." Next, we estimate "reallocated income," or the share of total worldwide taxable income in a given industry that will be reallocated, relative to the status quo (governed by the PE concept and the arm's-length principle), as a result of the unified approach rules.

II. Nexus and Income Allocation

The system that governs how an MNE's global profits are taxed relies on principles that originated in the 1923 work of the League of Nations and determine how two interrelated questions are addressed. The first is a threshold question about nexus: Under what circumstances does a country have a right to tax the profits of an enterprise? The second question asks how much of an MNE's profits should be taxed in each country that meets the nexus threshold.

Nexus is addressed via the concept of a PE, and the rules that determine how much of an MNE's income should be taxed by a state that has established its right to tax have been based on the separate-entity accounting and arm's-length principles. Those foundations of the international tax system are likely to undergo some change if the OECD's rules for determining nexus and allocating taxable income are adopted.

Consistent with previous documents released by the OECD as part of its project to address the tax challenges of the digital economy, the consultation document broadly describes a market jurisdiction as one in which an MNE has

sales, consumers, customers, or users. In terms of scope of the new nexus and income allocation rules, the unified approach contemplates large, profitable, consumer-facing businesses, broadly defined — for example, businesses that generate revenue from supplying consumer products or providing digital services that have a consumer-facing element. The unified approach will likely exclude from its scope some sectors (for example, the consultation document excludes extractive industries and commodities and asks if other sectors such as financial services should also be carved out). The OECD also considers size thresholds — such as the €750 million revenue threshold for filing a CbC report, as part of transfer pricing documentation requirements mandated under action 13 of the original BEPS project — to define the project's scope.

Under the unified approach, a market jurisdiction's share of an MNE's taxable income will comprise up to three elements. A jurisdiction can claim the first (amount A) if the MNE meets the threshold for the new nonphysical concept of nexus in that jurisdiction. According to the proposal, the new nexus concept will rely on factors, such as an MNE's sales in a jurisdiction and advertising services, that are indicative of the company's "sustained and significant involvement in the economy of a market jurisdiction, such as through consumer interaction and engagement, irrespective of its level of physical presence in that jurisdiction." The nonphysical concept creates a new taxing right, and amount A is the concomitant income allocation to market jurisdictions possessing that right. Also, if (and only if) an MNE has a PE (as defined under current rules that require physical presence) in a market jurisdiction, the jurisdiction will have the right to tax one or both of the other two elements (amounts B and C, as described below).

The determination of amount A is based on a formulaic application of the concepts of the residual profit-split method familiar to transfer pricing practitioners (although, given its formulaic design, it is similar to the transfer pricing method in name only). It starts with the MNE group's overall global profit as reported in the group's consolidated financial statements. Next, from that global group profit, the amount

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[4]Ours is a static analysis that does not try to account for behavioral responses to global change. Those kinds of behavioral responses — across a range of decision margins — might not be trivial.

deemed to constitute residual profit is identified. This step will be based on a predetermined rate or percentage that will serve as the cutoff for routine profits, and the amount of global profit over that cutoff will be the group's deemed residual profit. Once that amount of the group's residual profit is determined, a share — again, based on a pre-specified fixed percentage that could vary by industry — will be deemed allocable in total to the market jurisdictions possessing the new taxing right. Finally, the total residual profit as determined under the preceding steps will be allocated among the relevant market jurisdictions via a formula based on the sales in each jurisdiction (and possibly other factors that serve as indicia of consumer or user involvement with the relevant MNE).

The consultation document leaves open the possibility that the calculation of amount A may be performed at the level of a given business line for an MNE rather than for the MNE as a whole. That is to prevent distortions when the MNE has multiple (and disparate) business lines that differ in terms of profitability and markets served. Similarly, the document also mentions the possibility of performing the calculation on a regional basis (relying on regional segmentation of financial statement data). Importantly, it describes the residual income captured by amount A as coming out of the tax base of jurisdictions that under existing income allocation rules (the arm's-length principle), claim nonroutine profits — for example, as owners of intangible property (IP). The document says jurisdictions can provide relief from double taxation for the income captured under amount A via foreign tax credits or an income exemption. This analysis assumes the exemption approach.

Amount B would apply to a market jurisdiction only when an MNE has a PE in that jurisdiction as a result of some combination of sales, marketing, and distribution operations. For amount B, the unified approach stipulates a fixed baseline return (for example, as a fixed percentage of sales) for routine market-facing activities. The consultation document does not specify how that baseline would be determined, and the OECD secretariat has asked for comments on how the return should be determined and whether that fixed remuneration should vary by industry or region.

Finally, and unlike amounts A and B, amount C will be determined under the application of the arm's-length principle. It allows taxpayers and (more likely) tax authorities to allocate to a market jurisdiction income above the baseline return for routine sales and distribution types of activities. That is intended to reflect facts and circumstances when the scope of an MNE's functions and activities in a jurisdiction are viewed to exceed the routine level covered by the baseline return under amount B. Given its reliance on the arm's-length principle, amount C also applies only to countries that meet the current rules based on physical presence via a PE.

III. Conceptual Framework

The new rules to allocate an MNE's taxable income to market jurisdictions under each constituent element of the unified approach differ from the arm's-length principle by degrees. Amount A is determined under a formulaic method that unambiguously falls outside the arm's-length principle. Amount B is determined in a manner that can be reconciled as a simplified and safe-harbor-like application of the arm's-length principle (one that takes discretion and flexibility away from taxpayers). Both the need for amount C under a given set of facts and the determination of the amount are governed entirely by the arm's-length principle. Thus, even in determining the income allocation for market jurisdictions, the unified approach doesn't abandon the arm's-length principle entirely.

Further, and outside the scope of the unified approach, the income allocation to and among source jurisdictions — or those where an MNE locates manufacturing operations, research and development facilities, personnel that perform and deliver specific types of services (internally or externally), and IP — will continue to be governed by the arm's-length principle (at least to some extent). The continued scope and relevance of the principle — that is, the extent to which it will govern income allocation to (and among) source jurisdictions (as well as among market jurisdictions via amount C) — will be constrained by the formulaic rules of the unified approach. The principle's remaining scope will be determined by the extent to which the formulaic measures under the unified approach act as

binding constraints on the income allocation that would have otherwise resulted from an unencumbered application of the arm's-length principle. The portion of an MNE's global pretax profit that will be allocated under the formulaic rules of amounts A and B is what the unified approach scope income amount is intended to measure.

The reallocated income is intended to measure a related but different effect of the OECD's proposed rules. The unified approach will add a separate income allocation standard that will operate in conjunction with the arm's-length principle (constrained in the manner described above) and therefore will generate an income allocation outcome different from the status quo (or any future outcome generated by an unconstrained application of the arm's-length principle). The difference between the two outcomes — that is, in terms of the total amount of an MNE's global income that is allocated differently under the unified approach's hybrid income allocation regime versus one that relies solely on the arm's-length principle — is the reallocated income attributable to the unified approach rules.

Together, the equations in this section provide a conceptual exposition of how the unified approach income and the reallocated income may be derived. The exposition involves comparing the cross-border allocation of global income for a hypothetical MNE under the current rules and under the new rules.

Under the naming convention we adopt, a "hat" denotes a variable that is determined under income allocation rules, meaning that it is those components of an MNE's taxable income that are directly influenced by the application of the arm's-length principle or the unified approach. A "prime" next to a hatted variable or parameter denotes that the variable is governed by the formulaic rules of the unified approach. Equation 1 shows the constituent parts that make up the taxable income ($\Pi_i(Current)$) for an MNE reported in a given jurisdiction "i" under *current* international rules on nexus and income allocation.

Equation 1

$$\Pi_i(Current) = \pi_i + \hat{\pi}_i(SR) + \hat{\pi}_i(MR) + \hat{\pi}_i(Res)$$

All hatted variables denote the part of the earnings before interest and taxes (EBIT) reported in the jurisdiction that are determined under the arm's-length principle. In contrast, the first component in Equation 1 is hatless because it represents (the sum total of) other elements making up pretax profit reported in the jurisdiction that are independent of income allocation rules entirely (for example, EBIT generated entirely through third-party dealings, extraordinary items not based on transfer pricing rules, and third-party interest expenses). Alternatively (or additionally), those can denote elements that will not otherwise be affected by the unified approach (for example, related-party interest expense and income). For this analysis, (lowercase) π_i refers to jurisdiction i's share of the MNE's global exogenous income. All other components of i's pretax profit make up i's share of endogenous income, or the income subject to income allocation rules under the prevailing international tax regime.

Within jurisdiction i's endogenous income, the term in the equation with "SR" denotes the EBIT attributable to routine source-based economic activities such as manufacturing and services. "MR" denotes the EBIT attributable to routine market-based activities such as sales, marketing, and distribution. "Res" denotes the EBIT reported in a jurisdiction that is attributable to nonroutine risk and assets (to the extent applicable to the jurisdiction). The second and third components on the right-hand side of Equation 1 — that is, denoting profits attributable to routine source- and market-based activities — are expected to be positive (or zero if inapplicable for a given jurisdiction) while the first and last terms could be negative, zero, or positive.

Equation 2 shows the constituent parts of the MNE's taxable income ($\Pi_i(New)$) reported in a jurisdiction under the unified approach.

Equation 2

$$\Pi_i(New) = \pi_i + \hat{\pi}_i(SR) + \hat{\pi}_i'(A) + \hat{\pi}_i'(B) + \hat{\pi}_i(C) + \hat{\pi}_i'(Res)$$

The first two components of the pretax profit reported in jurisdiction i under the new regime

are the same as under the current regime — that is, they are not influenced by the unified approach in any way. The third, fourth, and fifth terms denote amounts A, B, and C, respectively, which are directly determined under the unified approach. The hat denotes that the term is governed by income allocation rules; the prime next to the terms denoting amounts A and B signifies that they are not determined under the arm's-length principle. Finally, the last term on the right side shows the residual income reported in the jurisdiction. Under the new regime, in contrast to the current regime, the determination of the residual and its allocation to a jurisdiction per the arm's-length principle may be limited and altered. How much a jurisdiction's claim on residual profits is altered will depend on how much of the total residual profit (otherwise subject to allocation under the arm's-length principle) will be carved out and allocated as amounts A and B to market jurisdictions under the unified approach. Amount C is not considered to have a similar effect because it will be governed by the arm's-length principle.

The analysis makes an important assumption: that the total income of the MNE that will be subject to tax across all jurisdictions will remain the same under the current and new international tax regimes. Admittedly, that is not a trivial assumption and requires that the OECD's new rules, which will coexist with current rules, will not result in double taxation. As noted, we assume that prevention of double taxation will be achieved via the exemption of income that will be reallocated under the unified approach. The above "no addition, no leakage" condition on worldwide taxable income is represented in the equation below, with "I" denoting jurisdictions where the MNE is subject to tax under the current rules and "I'" representing the jurisdictions where the MNE will be subject to tax under the new rules (with $I' \geq I$ in light of the new nonphysical nexus concept adding jurisdictions with a taxing right).

Equation 3

$$\sum_{i=1}^{I'} \Pi_i(New) = \sum_{i=1}^{I} \Pi_i(Current) = \Pi$$

Amounts A and B are assumed to be determined as shown in equations 4 through 7.

Equation 4

$$\hat{\pi}_i'(A) = \hat{\alpha}' \times [(\frac{\Pi_{EBIT}}{Sales} - \hat{\rho}') \times Sales] \times s_i$$

In Equation 4, "$Sales$" denotes the MNE's total third-party sales revenue across all the I' jurisdictions. The term "Π_{EBIT}" denotes the worldwide consolidated EBIT for the MNE as reported in its financial statements; the fraction in the parenthesis thus represents the worldwide EBIT margin for the group.[5] The parameter $\hat{\rho}'$ denotes the routine return (per dollar of sales) assumed and set in the formula for amount A. The difference in the parenthesis thus calculates the total deemed residual profit (per dollar of sales) under the formula for amount A. The full expression in the square brackets — that is, the product of the deemed residual profits per dollar of sales multiplied by the MNE's total sales — provides the absolute amount of those deemed residual profits. The parameter $\hat{\alpha}'$ represents the share of the deemed residual profits — again, to be set per the formula for amount A — that is allocable to all the market jurisdictions that have the new taxing right. Finally, "s_i" denotes jurisdiction i's share of the deemed residual profits (allocable to market jurisdictions). While the specifics of the allocation basis under the unified approach are unknown, the OECD has said it will rely, at least in part, on sales. For this analysis, we assume that the allocation basis is third-party sales revenue in a given jurisdiction, such that s_i is calculated as shown below (where "$Sales_i$" represents the MNE's sales in jurisdiction i).

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[5]The use of a company's overall EBIT in the formula for amount A is an assumption. Alternative conceptions of this rule may instead use pretax profit.

Equation 5

$$s_i = \frac{Sales_i}{\sum_{i=1}^{I'} Sales_i} = \frac{Sales_i}{Sales}$$

Assuming that the unified approach allocates deemed residual profit based on each jurisdiction's share of worldwide sales as described in Equation 5, Equation 4 simplifies to Equation 6.

Equation 6

$$\hat{\pi}_i'(A) = \hat{\alpha}' \times [(\frac{\Pi_{EBIT}}{Sales} - \hat{\rho}') \times Sales_i]$$

Amount B for a given jurisdiction is determined by a preset profit margin (expressed as a percentage of sales and denoted by $\hat{\beta}'$), as shown in Equation 7.[6]

Equation 7

$$\hat{\pi}_i'(B) = \hat{\beta}' \times Sales_i$$

A. Unified Approach Scope Income

Based on the above, the sum of amounts A and B represents the part of an MNE's global pretax income that will be directly allocated under the formulaic income allocation rules of the unified approach. That unified approach scope income (denoted by $\widehat{\Pi}'_{UA}$) amount is shown in Equation 8.

Equation 8

$$\widehat{\Pi}'_{UA} = \sum_{i=1}^{I'} [\hat{\pi}_i'(A) + \hat{\pi}_i'(B)]$$

From that, we derive and define the unified approach scope income percentage (UAP) as the percentage of an MNE's global pretax income allocated under the formulaic rules of the unified approach as shown below.

Equation 9

$$UAP = \frac{\sum_{i=1}^{I'} [\hat{\pi}_i'(A) + \hat{\pi}_i'(B)]}{\Pi}$$

B. Reallocated Income

The change in jurisdiction i's taxable income resulting from the introduction of the unified approach is derived as the difference between equations 2 and 1, as shown in Equation 10.[7]

Equation 10

$$\Delta\Pi_i = [\hat{\pi}_i'(A) + \hat{\pi}_i'(B) + \hat{\pi}_i(C) - \hat{\pi}_i(MR)] - [\hat{\pi}_i(Res) - \hat{\pi}_i'(Res)]$$

Whether a country does better or worse under the unified approach will depend on the magnitude of the effects captured by the expressions in the brackets in Equation 10. The expression in the first set of brackets shows the change in jurisdiction i's taxable income that comes from its status as a market jurisdiction (taking into consideration both the expanded definition of those jurisdictions under the unified approach and the new taxing right afforded them). A jurisdiction will see an increase in its taxable income, and the magnitude of that increase will be higher if (a) the amount captured under amount A is higher (via lower values set for the deemed routine return threshold or the higher share of deemed residual profits allocable to the market jurisdictions); (b) the baseline return threshold in the formula for amount B is higher; and (c) the routine return attributed to the jurisdiction under the arm's-length principle for sales, marketing, and distribution activities under the status quo is lower. Any increase in taxable income a jurisdiction experiences in its capacity as a market jurisdiction will be diluted by a decrease in the jurisdiction's claim on residual income in its capacity as a source jurisdiction (for example, as a principal or IP owner) under the arm's-length principle. That dilution is shown in the expression in the second set of brackets. The higher the jurisdiction's claim on residual income under the arm's-length principle, the greater the dilution,

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[6] We assume a routine baseline return expressed as a percentage of revenues for amount B.

[7] As noted, the component of a jurisdiction's taxable income that is independent of income allocation rules and that represents the source-based routine return will remain unchanged and therefore drop out of the equation showing the change in jurisdiction i's taxable income brought about by the unified approach.

because a portion of that residual income will now be captured by amounts A and B and allocated to other market jurisdictions. Moreover, jurisdictions that are not market jurisdictions (either under the existing PE rules or under the new nonphysical nexus rule) but which claimed a share of residual income under the arm's-length principle will be worse off because the amount of residual income allocable under the arm's-length principle will be reduced.

Aggregating Equation 10 across all I' jurisdictions together with the no addition, no leakage condition of Equation 3 yields Equation 11.

Equation 11

$$\sum_{i=1}^{I'} [\hat{\pi}_i'(A) + \hat{\pi}_i'(B) + \hat{\pi}_i(C) - \hat{\pi}_i(MR)] - \sum_{i=1}^{I} [\hat{\pi}_i(Res) - \hat{\pi}_i'(Res)] = 0$$

Equation 11 shows that the gain in the tax base realized by market jurisdictions in total has to equal the sum total of tax base lost by source jurisdictions that had a claim on residual profits (as determined under the arm's-length principle).

Denoting the subset of the I' jurisdictions that are net "winners" under the unified approach by "$I'(+)$" and those that are net "losers" by "$I'(-)$," Equation 3 implies the following.

Equation 12

$$\sum_{i=1}^{I'(+)} \Delta\Pi_i + \sum_{i=1}^{I'(-)} \Delta\Pi_i = 0 \Rightarrow \sum_{i=1}^{I'(+)} \Delta\Pi_i = - \sum_{i=1}^{I'(-)} \Delta\Pi_i$$

All of the above allows us to quantify the reallocated income (Π_{RA}) resulting from the unified approach as shown in Equation 13.

Equation 13

$$\Pi_{RA} = \sum_{i=1}^{I'(+)} \Delta\Pi_i$$

Further, as a measure of the degree of change that results from the unified approach, we define "reallocated percentage" (RAP) as the reallocated income divided by the MNE's total (and by assumption, unchanged) pretax income (Π_{RA}/Π).

Equation 14

$$RAP = \frac{\sum_{i=1}^{I'(+)} \Delta\Pi_i}{\Pi}$$

The RAP provides an estimate of the impact of the unified approach — that is, the proportion of an MNE's global pretax income that is reallocated under the approach.

IV. Source Data and Summary Statistics

The data used in our analysis come from the IRS SOI website. The SOI program annually publishes statistics on "the operations of the internal revenue laws." The information published by the SOI is frequently used in the analysis of tax policy — for example, in the projection of tax revenues and expenditures and the estimated effects of tax law changes. In December 2018 the SOI published six tables summarizing aggregated and anonymized information from MNEs' filings of Form 8975, "Country-by-Country Reporting," and its Schedule A, "Tax Jurisdiction and Constituent Entity Information."

SOI Table 1A shows data aggregated from 1,101 reporting MNE groups that filed a Form 8975 for fiscal 2016. It shows the "aggregated profit (loss) before income tax" for those 1,101 groups, as well as the distribution of that pretax profit across select jurisdictions where the MNEs reported profit for income tax purposes. Table 1A also contains aggregated data by jurisdiction on other items that must be reported in the CbC reporting forms, such as (related- and unrelated-party) revenues, income taxes paid and accrued in the current year, number of employees, and tangible assets.

SOI Table 2 categorizes the data in Table 1A across seven major industries. We used data covering five of those industry groupings: manufacturing; wholesale and retail trade, transportation, and warehousing, which we call "wholesale, retail, and related"; information; professional, scientific, and technical services, which we call "professional services"; and management of companies and enterprises, all other services (except public administration), which we call "other services." We excluded agriculture, forestry, fishing and hunting, mining,

Table 1. Summary Statistics by Industry

	Manufacturing	Wholesale, Retail, and Related	Information	Professional Services	Other Services
Number of Reporting Multinationals	411	208	92	95	102
Pretax Profit (millions USD)	$506,851	$271,176	$160,522	$41,524	$212,254
Third-Party Sales Revenue (millions USD)	$3,860,811	$3,419,673	$1,056,173	$324,790	$866,791
Number of Employees (thousands)	8,815	8,389	1,967	1,383	4,297
Tangible Assets (millions USD)	$2,268,451	$1,426,059	$440,956	$86,468	$613,036
Pretax Profit Margin	13.1%	7.9%	15.2%	12.8%	24.5%
EBIT Margin (estimate)*	16.7%	10.8%	21.7%	17.5%	33.5%
Pretax Profit as Percent of Tangible Capital	22.3%	19.0%	36.4%	48.0%	34.6%
Pretax Profit per Employee (thousands USD)	$57.5	$32.3	$81.6	$30.0	$49.4

Note: The asterisk denotes that EBIT is not reported in the CbC reporting data but is instead an estimate derived from the pretax profit and ICR for different industries as described in the text.

quarrying, oil and gas extraction, utilities, and construction, as well as finance and insurance, real estate, and rental and leasing because they might be carved out of the scope of the unified approach rules.

Table 1 shows some key summary statistics such as total revenue, tangible capital, employees, pretax profit, and ratios based on the IRS data by industry. CbC report filing does not require taxpayers to report information on EBIT, so the SOI data do not include EBIT information. We derive an estimate of the EBIT for each industry based on the pretax profit as reported in the SOI data and an estimate of the industrywide interest coverage ratio (ICR).[8] The EBIT margin shown for each industry (defined as EBIT divided by third-

party revenue) is thus based on the estimated EBIT derived as described above.[9]

V. Quantitative Analysis

The framework in Section III is applied to the SOI's aggregated CbC reporting data by industry to estimate and analyze the unified approach's impact on international income allocation. The premise underlying that exercise is as follows: For a given industry, the observed allocation of taxable income across jurisdictions represents the outcome of current nexus and income allocation rules being applied for each MNE in the SOI data. In effect, the analysis treats the industry as a composite MNE that is the aggregate of the MNE groups covered by the SOI data. The observed income allocation is treated as the outcome of the current rules having been applied to the composite MNE.[10] We next superimpose the

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[8] The ICR is defined as EBIT divided by the (net) interest expense. The EBIT for a given industry was estimated from the pretax profit (PBT, as reported by the SOI). The ICR is estimated as:

$$EBIT_i = PBT_i \times \frac{ICR_i}{ICR_i - 1}$$

The ICR data was obtained from Francisco Palomino et al., "The Information in Interest Coverage Ratios of the US Nonfinancial Corporate Sector," FEDS Notes: Board of Governors of the Federal Reserve System (Jan. 10, 2019).

[9] Figures showing the distribution of total pretax profit across the top 20 jurisdictions for each industry are available from the authors on request.

[10] The analysis relies on the (admittedly nontrivial) assumption that the magnitude of the change can be reliably estimated by using aggregated data. For that to be true, the aggregation of (MNE-level) income allocation outcomes (under a given regime) should not diverge widely from the income allocation outcome determined at the aggregated (across MNEs) level.

unified approach on the data for each composite MNE to estimate the distribution of taxable income that would result from the new rules. The subset of pretax income determined under the formulaic rules of the unified approach — that is, amounts A and B — estimated by the superimposition of the rules on the CbC reporting data for an industry constitutes the unified approach scope income. The unified approach scope income estimated for an industry divided by its total pretax income is its UAP, or the measure of the total global pretax income whose cross-border allocation is governed by formulaic rules outside the arm's-length principle.

The superimposition of the unified approach and the comparison of that outcome to that under the status quo allows for an estimation of the amount of reallocated income for each industry. The RAP, which represents the reallocated income as a percentage of pretax income, for each industry is intended to serve as a measure of the magnitude of the change to the status quo caused by the unified approach. In other words, it is the extent to which the unified approach overrides the income allocation outcome under the arm's-length principle.

The following subsection describes the overall approach taken and assumptions made in applying the framework of Section III to the CbC reporting data on the five industries analyzed. We note an important caveat regarding assumptions and parameter values used in the analysis: None — whether regarding the application of the arm's-length principle or the design of the unified approach for amounts A and B — should be construed as representing the authors' views on the appropriate application of the respective standards or the appropriateness (from an economic or policy standpoint) of specific values for design parameters assumed. Those assumptions are made solely to establish specific parameter values (within the broad design of the unified approach) that necessarily must be identified as inputs for analyzing and illustrating potential income allocation outcomes under the revised income allocation rules, and the sensitivity of those estimated outcomes to variations in the assumed values.

A. Method and Assumptions

1. Status Quo

The observed pretax profit in each jurisdiction is deconstructed or categorized into three constituent elements corresponding to the last three terms on the right-hand side of Equation 1.

First, the source-based routine income under the arm's-length principle $\hat{\pi}_i(SR)$ that represents a routine return for source-based activities is estimated[11] as a fixed percentage of either tangible capital or a broader and estimated measure of routine capital in the jurisdiction.[12]

Next, the market-based routine income under the arm's-length principle $\hat{\pi}_i(MR)$ (which represents a routine return for in-country sales, marketing, distribution, and related activities) is estimated as 1.5 percent times the third-party revenues in the jurisdiction. A market-based routine return (under the arm's-length principle and current nexus rules) is attributed to a jurisdiction only if the MNE reports nonzero capital or that it has employees there (in addition to third-party revenues).

The residual income or loss (together with the exogenous income component) is quantified as the difference between the pretax profit for the jurisdiction less the sum of the source-based routine return and the market-based routine return ($\hat{\pi}_i(Res) = \hat{\Pi}_i - \hat{\pi}_i(SR) - \hat{\pi}_i(MR)$).[13]

Finally, we define the share of the total residual profit across jurisdictions that is claimed by jurisdiction *i* under the arm's-length principle as "p_i" and calculate that as shown in Equation 15.

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[11]The routine source-based return in a jurisdiction is calculated as the greater of 10 percent of tangible capital or 5 percent of routine capital, which is an estimate derived by multiplying the number of employees in a given jurisdiction by an estimated routine capital-to-labor ratio. That ratio is the tangible capital or labor for the industry as a whole. All of that is to account for the intensity of using tangible capital in some jurisdictions, and industries not being fully representative of routine capital intensity overall — for example, that capital being more fully reflected in workforce in place or organizational capital in specific instances.

[12]At the aggregate industry level, the source-based routine returns estimated as described range from approximately 6.1 percent to 9.7 percent of the industry's total third-party revenues.

[13]The exogenous income cannot be separately identified, given the limitations of CbC data. However, that limitation does not significantly affect the analysis because that part of a jurisdiction's pretax income is independent of income allocation rules and therefore unchanged under the status quo or the new regime.

Equation 15

$$p_i = \frac{\hat{\pi}_i(Res)}{\sum_{i=1}^{I} \hat{\pi}_i(Res)} = \frac{\hat{\pi}_i(Res)}{\widehat{\Pi}(Res)}$$

Table 2 shows the results of the "deconstruction" of taxable income under the status quo into the three constituent elements described above at the aggregate level — that is, the total routine source-country return, the total routine market-country return, and source-country residual profit for each industry grouping, and source-country residual profit.

2. Income Allocation Under the Unified Approach

The total taxable income for each jurisdiction under the new regime is estimated per Equation 2 using "base case" assumptions described below. As noted, the source-based routine return is the same for a jurisdiction as that under the status quo.

For determining a jurisdiction's amount A, we assume a value of 10 percent for the routine return threshold ($\hat{\rho}'$ in Equation 5). We use the EBIT margins estimated in Section IV for each industry as the measure of the composite MNE's overall profit margin from which the threshold routine return of 10 percent is subtracted to determine the residual profits (per dollar of revenue) for the composite MNE. Of that residual profit (per dollar of revenue), 10 percent (the assumed value for α' in Equation 5) is taken to represent the share allocable to the market jurisdictions in total that have the new taxing right. Finally, the dollar value of amount A allocable to a given jurisdiction is determined by multiplying the residual income (per dollar of revenue) allocable to the market jurisdictions in total as calculated above by the third-party revenue in that jurisdiction.

Amount B for a given jurisdiction is determined by multiplying the baseline return ($\hat{\beta}'$ in Equation 7) by the third-party revenue in that jurisdiction. We assume a value of 2.5 percent for the baseline return. A jurisdiction is allocated amount B only if it has employees or physical capital (because this component is taxable in a jurisdiction only if the MNE has a physical presence there).

Amount C represents an incremental return (over amount B) that is determined under the arm's-length principle and is attributable to a jurisdiction when the level of sales, marketing, and distribution activities there are deemed to exceed those covered by amount B's baseline return. Amount C would be required in the framework of our calculation only if the baseline return of amount B falls short of the market-based routine return assumed under the application of the arm's-length principle. Because that is not the case, the value of amount C implied by our assumption is zero.

Next, the revised source-based residual income earned by a jurisdiction is estimated in two steps. The first step determines the overall global pool of residual profits available for allocation under the arm's-length principle. To estimate that, we rely on the "no addition, no leakage" assumption — that the total income subject to tax across all jurisdictions for an MNE remains unchanged. Consequently, the total source-based residual profit under the new regime is calculated as the difference between the overall global pretax income of the composite MNE and the sum of the other components quantified above that will constitute the MNE's taxable income under the new regime in a given jurisdiction (if entitled to that component of taxable income) — that is, the (unchanged) source-based routine return, amounts A, B, and (potentially) C. The calculation of the aggregate revised source-based residual profit for the composite MNE — relative to an unconstrained application of the arm's-length principle — (denoted by "$\widehat{\Pi}'(Res)$") is shown in Equation 16 (with amount C being shown for generality).

Equation 16

$$\widehat{\Pi}'(Res) = \Pi - \sum_{i=1}^{I'} [\hat{\pi}_i'(A)] - \sum_{i=1}^{I} [\hat{\pi}_i(SR) + \hat{\pi}_i'(B) + \hat{\pi}_i(C)]$$

Finally, the revised source-based residual profit for a given jurisdiction is determined. First, a subset of jurisdictions are identified as surrender states ("$\bar{I}$"), or jurisdictions whose share of (source-based) residual profits under the status quo (p_i in Equation 15) exceeds a significance threshold ("$\bar{p}$"). We use a significance threshold of 1 percent, so only jurisdictions with a share of global residual profits under the status

Table 2. Taxable Income by Category Under the Status Quo

	Manufacturing	Wholesale, Retail, and Related	Information	Professional Services	Other Services
Source-Country Routine Profit (millions USD)	$239,607	$151,752	$48,077	$17,533	$71,394
Market-Country Routine Profit (millions USD)	$57,912	$51,295	$15,843	$4,872	$13,002
Source Residual Profit (loss) (millions USD)	$209,332	$68,129	$96,603	$19,118	$127,858
Source-Country Routine Profit/Total Pretax Profit	47.3%	56.0%	30.0%	42.2%	33.6%
Market-Country Routine Profit/Total Pretax Profit	11.4%	18.9%	9.9%	11.7%	6.1%
Source Residual Profit (loss)/ Total Pretax Profit	41.3%	25.1%	60.2%	46.0%	60.2%
Source Residual Profit (loss)/ Total EBIT*	32.5%	18.4%	42.2%	33.7%	44.1%

Note: The asterisk denotes that EBIT is not reported in the CbC reporting data but is instead an estimate derived from the pretax profit and ICR for different industries as described in the text.

quo higher than 1 percent will concede a part of their (original) residual profits to ensure that Equation 16 is satisfied. Next, the amount of residual profits conceded by a given jurisdiction is proportionate to the share of total residual profits among all surrender states originally claimed by that jurisdiction. The intent of that threshold is to eliminate or reduce the effect of the "noise" in the estimation and attribution of residual profit across jurisdictions based on the observed distribution of pretax profit. Application of the threshold identifies jurisdictions that account for a nontrivial share of estimated global residual profits. Those jurisdictions are therefore more likely to be the intended recipients of that income under the arm's-length principle.

Under the analysis, only the surrender states experience a reduction in their residual profits ($\widehat{\Pi}_i'(Res) < \widehat{\Pi}(Res)$ if $I \in \bar{I}$) it remains unchanged for others ($\widehat{\Pi}_i'(Res) = \widehat{\Pi}_i(Res)$ if $I \notin \bar{I}$). Said differently, the entire burden of satisfying Equation 16 via a reduction in residual profits is borne by the surrender states.

The components of the taxable income under the new international tax regime for the five composite MNE groups are shown in Table 3.

B. Unified Approach Percentage

Table 4 shows the UAP (the unified approach scope income divided by total pretax income) for each industry under the base case assumptions. Two alternative measures of pretax income — that is, pretax profit and estimated EBIT — are used for computing the UAP for each industry. The UAP is highest for the wholesale, retail, and related industry, which has lowest pretax profit margin of 7.9 percent, and lowest for other services, which has the highest pretax profit margin of 24.5 percent.

Two components make up the UAP, and the influence of each depends on the industry's pretax profit margin. The fixed baseline return of amount B represents a higher share of pretax profit margin for the wholesale, retail, and related industry than for other services. That component of the UAP is higher for lower-margin industries than for higher-margin ones. However, the formula for amount A captures a larger proportion of the pretax profit margin for other services than for wholesale, retail, and related, reversing part of the divergence in the UAP between high- and low-margin industries on account of the first effect via amount B. If a higher

Table 3. Taxable Income by Category Under the Unified Approach

	Manufacturing	Wholesale, Retail, and Related	Information	Professional Services	Other Services
Source-Country Routine Profit (millions USD)	$239,607	$151,752	$48,077	$17,533	$71,394
Amount A (millions USD)	$25,739	$2,746	$12,321	$2,425	$20,332
Amount B (millions USD)	$96,520	$85,492	$26,404	$8,120	$21,670
Amount C (millions USD)	$0	$0	$0	$0	$0
Source Residual Profit (loss) (millions USD)	$144,985	$31,186	$73,720	$13,445	$98,857
Source-Country Routine Profit/ Total Pretax Profit	47.3%	56.0%	30.0%	42.2%	33.6%
Amount A/Total Pretax Profit	5.1%	1.0%	7.7%	5.8%	9.6%
Amount B/Total Pretax Profit	19.0%	31.5%	16.4%	19.6%	10.2%
Amount C/Total Pretax Profit	0.0%	0.0%	0.0%	0.0%	0.0%
Source Residual Profit (loss)/ Total Pretax Profit	28.6%	11.5%	45.9%	32.4%	46.6%

Table 4. UAP by Industry Grouping (Base Case)

	Manufacturing	Wholesale, Retail, and Related	Information	Professional Services	Other Services
UAP - UA Scope Income/Pretax Profit	24.1%	32.5%	24.1%	25.4%	19.8%
UAP - UA Scope Income/EBIT	19.0%	23.9%	16.9%	18.6%	14.5%

share of deemed residual profit were assumed to be allocable to market jurisdictions than what is assumed in the base case, there would be reduced UAP divergence among industries. The UAP for higher-margin industries would be closer to that for low-margin industries as a result of amount A capturing a higher share of pretax income for higher-margin industries.

Figure 1 in the Appendix presents a sensitivity analysis showing how the UAP (expressed as a percentage of EBIT) for each industry changes under alternate assumptions on the share of deemed residual profits allocated to market jurisdictions. Figure 2 depicts an analogous sensitivity analysis for the baseline return under amount B. As discussed, the UAP for high-margin industries is most sensitive to changes in amount A. In contrast, the UAP for low-margin industries is most sensitive to changes in amount B.

C. Reallocated Percentage

Table 5 shows the RAP by industry grouping. The RAP is calculated by dividing the amount of reallocated income for an industry (caused by the introduction of the unified approach) by the industry's total pretax profit. It is intended to measure the unified approach's overriding effect on an income allocation that would otherwise be shaped exclusively by the arm's-length principle.

The pattern for the RAP across industries is similar to that of the UAP: highest for wholesale, retail, and related and lowest for other services. The reasons are analogous to those outlined for the UAP, although the UAP is only one of the factors that influence the RAP. The RAP measures the extent to which the unified approach overrides the status quo income allocation under the arm's-length principle and reallocates a share of the pretax income relative to that status quo. It

Table 5. RAP by Industry Grouping (Base Case)

	Manufacturing	Wholesale, Retail, and Related	Information	Professional Services	Other Services
RAP - UA Scope Income/ Pretax Profit	5.0%	8.0%	6.2%	7.2%	2.2%
RAP - UA Scope Income/ EBIT	3.9%	5.9%	4.4%	5.3%	1.6%

is by no means guaranteed that a high UAP will necessarily translate into a similarly high RAP. Thus, while the formulaic rules of the unified approach control the cross-border allocation of a large portion of global pretax income (almost 33 percent at the high end) — as shown by the UAP — the approach's impact in overriding the allocation under the arm's-length principle is much more modest (below 3 percent on the low end).

Figure 3 in the appendix presents a sensitivity analysis showing how the RAP (expressed as a percentage of EBIT) for each industry changes under different assumptions on the share of deemed residual profits allocated to market jurisdictions. Figure 4 depicts an analogous sensitivity analysis for the baseline return under amount B.

VI. Conclusion

The OECD's unified approach will make fundamental changes to century-old international rules that govern the allocation of taxing rights and taxable income. This article provides a framework for analyzing and quantifying the impact of those changes and identifying and estimating their key aspects.

The UAP is intended to measure the share of an MNE's global pretax income whose international allocation will be governed by the formulaic conventions of the unified approach. Under the assumed inputs, the estimates for the UAP range from just under 15 percent to almost 33 percent depending on the industry and the measure of pretax income used (pretax profit or EBIT). The estimates suggest a maximum potential of 67 to 85 percent in terms of the share of pretax income that will continue to be allocated under the arm's-length principle.

The RAP is intended to measure the share of an MNE's global pretax income that will be reallocated under the unified approach. Under the assumed inputs, the estimates for the RAP range from just under 2 percent to 8 percent depending on the industry and the measure of pretax income used (pretax profit or EBIT). While the formulaic elements of the unified approach may directly govern the allocation of a large portion of an MNE's pretax income, their impact in terms of generating an outcome different from the status quo is more modest.

There are important caveats that apply to the analysis and its results. The analysis relies on aggregated CbC reporting data and derives estimates of the change in international tax rules from data aggregated across MNE groups. For that kind of estimate to be representative of (or at least informative about) the aggregate impact of the estimated change that will apply at the individual MNE level, the underlying MNE-level data should not widely diverge from the aggregation (for example, a significant number of similarly sized MNEs in an industry having profitability levels across a wide spectrum around the industry average). In any event, even if the estimates derived in this analysis are representative of the industries covered, results for individual MNEs may vary widely.

The limitations of the CbC reporting data inherently constrain any analysis relying on it — jurisdictions that are the destination of an MNE's sales that are reported or booked in another jurisdiction cannot be identified using CbC reporting data. Consequently, estimates of the effect of the rules covering amount A are potentially distorted by the limitation of the data.

Another problem with using CbC reporting data (or an aggregation of it) is potential double counting of items (for example, across

jurisdictions or reported as stateless because of flow-through entities). Some of the related concerns are likely addressed through our use of relative measures and indices — for example, the UAP and RAP are expressed as percentages of the underlying total pretax income. Finally, and outside those caveats, the data used in the analysis (predominantly, if not exclusively) cover U.S.-headquartered MNEs. The results — especially for countries that gain or concede a share of the reallocated income — may not be representative of the change experienced by MNEs headquartered in other countries (especially large markets).

Despite those caveats and limitations, the analysis can provide useful insight. An important take-away is the likely continued, albeit narrowed, relevance of existing nexus and income allocation rules grounded in the PE concept and the arm's-length principle. Rumors of the arm's-length principle's demise may have been somewhat exaggerated. At least for now.
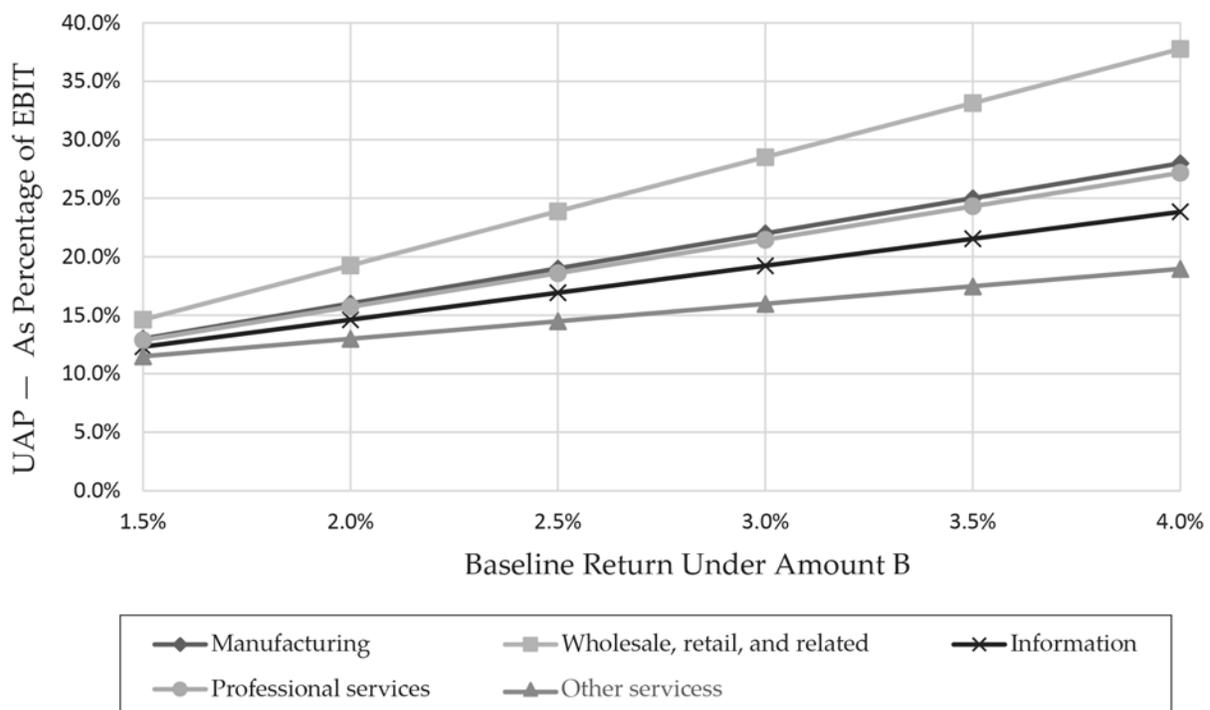
Appendix

Figure 1 shows how the UAP (expressed as a percentage of EBIT) for each industry changes under alternate assumptions for the share of deemed residual profits allocated to market jurisdictions (0 percent to the maximum possible share of 100 percent). The UAP for each industry rises with the share of deemed residual profits quantified and reallocated under amount A as shown by upward-sloping curves for each industry. The slopes — shallowest for wholesale, retail, and related and steepest for other services — show that the maximum potential impact of amount A (when 100 percent of the deemed residual profits are captured under the formula) is the greatest for high-margin industries and lowest for low-margin industries. As the share of deemed residual profits allocated to market jurisdictions in the formula for amount A rises, the UAP for each industry moves proportionately closer to the maximum potential UAP value for that industry. Given the higher maximum value of the UAP for higher-margin industries, the change in the formula for amount A has greater effect for higher-margin industries (and companies) and is

Figure 1. Share of Deemed Residual Profits to Market Jurisdictions and UAP (as a percentage of EBIT)[a]

[a]Deemed routine profit margin under amount A (10 percent) and baseline return under amount B (2.5 percent) unchanged.

Figure 2. Baseline Return Under Amount B and UAP (as percentage of EBIT)[a]

[a]Deemed routine profit margin (10 percent) and share of deemed residual income allocable to market jurisdictions (10 percent) under amount A unchanged.

reflected in the steeper UAP sensitivity curves for those industries.

Figure 2 depicts how the UAP (expressed as a percentage of EBIT) for each industry changes with the baseline return under amount B. A given baseline return represents a higher share of the pretax income for a low-margin industry (and company) than for a higher-margin one. Increases in the baseline return translate into a greater effect on the UAP for a low-margin industry and steeper UAP sensitivity curves than for a high-margin industry.

Figure 3 shows how the RAP (expressed as a percentage of EBIT) for each industry changes under alternative assumptions on the share of deemed residual profits that will be allocated to market jurisdictions as part of amount A. The RAP represents the overriding impact of the formulaic conventions of the unified approach. While the UAP is one driver of that relationship, the RAP also depends on how different the status-quo income allocation is from that resulting from the unified approach. As shown, the impact of an increased share of deemed residual profits being

allocated to market jurisdictions under the formula for amount A translates into the greatest RAP increase for the information industry, closely followed by professional services. The high sensitivity for those industries reflects a combination of relatively high EBIT margins (and therefore higher UAPs) and the extent of (the underlying) divergence between the status quo income allocation and the outcome under the unified approach.
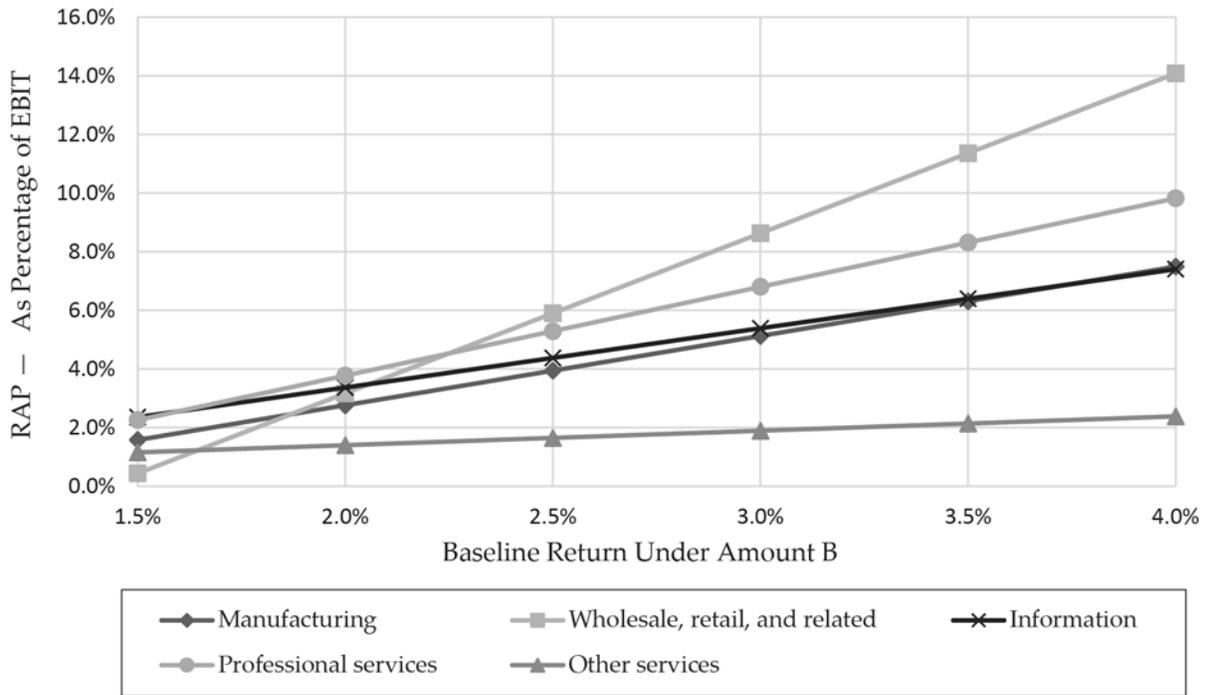
Figure 4 shows how the RAP (expressed as a percentage of EBIT) for each industry changes with the baseline return under amount B. Again, the result reflects a combination of the impact of the revised amount B parameter on the UAP and the magnitude of the difference between the status quo income allocation and the unified approach allocation. The RAP's sensitivity to the baseline return under amount B for each industry largely mirrors that of the UAP: highest for low-margin industries and lowest for high-margin industries.

Figure 3. Share of Deemed Residual Profits to Market Jurisdictions and RAP (as percentage of EBIT)[a]
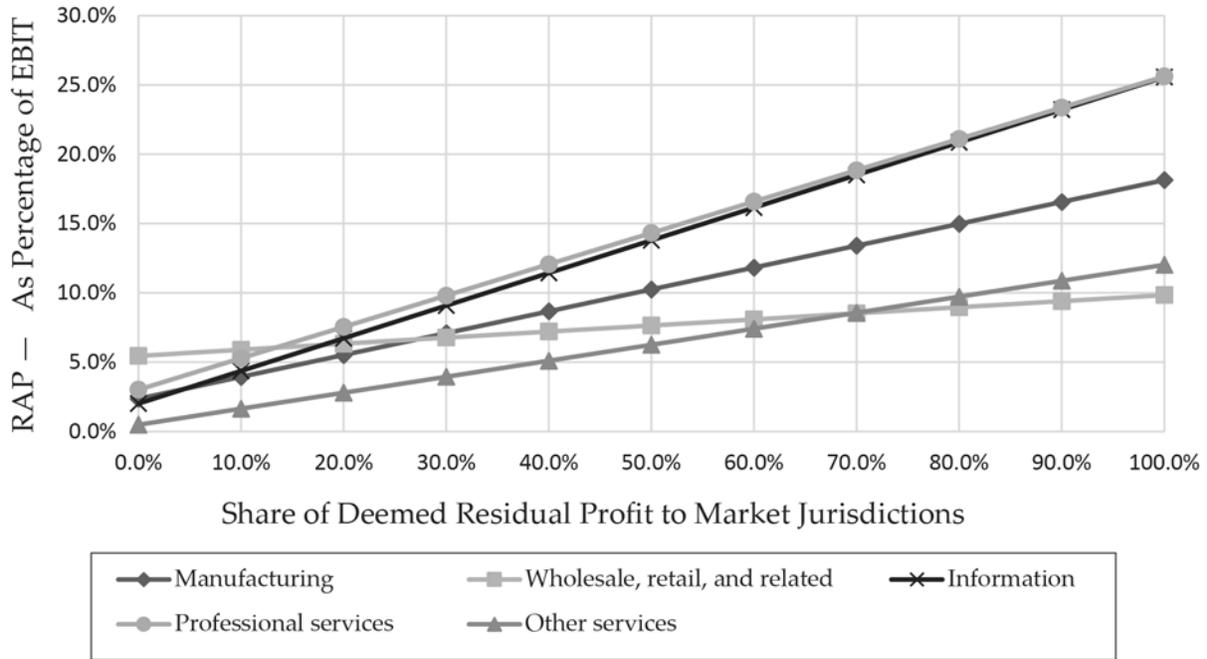
[a]Deemed routine profit margin under amount A (10 percent) and baseline return under amount B (2.5 percent) unchanged.

Figure 4. Baseline Return Under Amount B and RAP (as percentage of EBIT)[a]

[a]Deemed routine profit margin (10 percent) and share of deemed residual income allocable to market jurisdictions (10 percent) under amount A unchanged.

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