Fundamental Corporate Tax Reform: Exploring a New Corporate Tax System with Destination-Based Cash Flow Taxation and Residual Profit Allocation*

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Abstract

Efforts have been made to address issues such as tax avoidance and tax competition arising from economic globalization and digitalization, and agreements have been reached on "Pillar I" and "Pillar II" as solutions to tax challenges arising from the digitalization of the economy, and preparations for their introduction are underway in various countries.

Meanwhile, the Destination-Based Cash Flow Taxation (DBCFT) and Residual Profit Allocation by Income (RPAI) plans, etc., have been proposed to fundamentally reform the problems of corporate taxation. Although DBCFT has advantages with regard to efficiency, suppression of tax avoidance, suppression of tax competition, and reduction of tax compliance cost, the deviation from current corporate taxation is significant and there are many issues to be addressed in terms of conforming to the World Trade Organization (WTO) Agreement and other similar agreements. RPAI does not solve all of the current taxation system's problems, but it has advantages when considering efficiency, suppression of tax avoidance, and reduction of tax competition, and its deviation from the current corporate taxation system is small. This deviation from the current corporate taxation is not as large as that of the DBCFT.

As for the direction of international taxation in the future, drastic corporate tax reform will not be implemented immediately, but rather, practical issues and the resolution status of current corporate taxation issues will be sorted out after first waiting for the introduction and establishment of digital taxation. If drastic corporate tax reform is deemed necessary, the scope of Residual Profit Allocation (RPA) introduction may be expanded in the form of an extension of the Pillar I mechanism, and in the future, the introduction of RPAI could be considered. Subsequently, if further reforms are required, it is assumed that the introduction of DBCFT will be discussed under an international agreement.

Keywords: International taxation, BEPS, tax avoidance

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I. Introduction

As globalization and the digitalization of economic activities continue to accelerate, the current corporate tax system faces significant challenges. These include tax avoidance by multinational companies through strategic tax planning and increased tax competition among governments. Efforts to address these issues have been underway since the 1990s, including the establishment of the Organisation for Economic Co-operation and Development (OECD)'s "Forum on Harmful Tax Practices" in 1998, the launch of the Base Erosion and Profit Shifting (BEPS) Project in 2012, and the publication of the final report in 2015. Regarding the tax challenges posed by the digitalization of the economy, which remained unresolved in the 2015 final report, agreements were reached on revising profit allocation rules (Pillar I) and implementing a global minimum tax (Pillar II). These measures aim to mitigate international tax competition and promote fair taxation of digital services and related economic activities.

However, under the current international tax regime, countries have incentives, such as reduced corporate tax rates, that make it difficult to completely avoid international tax competition. It also leaves opportunities for multinational companies to engage in tax avoidance. Furthermore, the current corporate taxation distorts the level of corporate investment, investment location, and means of financing, and is problematic from the standpoint of efficiency. From the perspective of resolving these issues, even before the agreement on digital taxation is reached, there have been discussions on a fundamental reform of the corporate tax system. Specifically, the Destination-Based Cash Flow Taxation (DBCFT), Residual Profit Allocation by Income (RPAI), and others have been proposed. RPAI is one of a family of Residual Profit Allocation (RPA) regimes that divide international business profit for tax purposes across countries into two parts. The revision of profit allocation rules for digital taxation (Pillar I) is also one of a family of RPA regimes. Although Pillar I shares some similarities with the RPAI in terms of concept and mechanism, there are significant differences with the RPAI in terms of target companies, target income calculation method, and allocation method. In addition, Formulary Apportionment (FA) has not been introduced in international taxation, but the European Commission is considering the introduction of a framework for business income taxation in Europe (Business in Europe: Framework for Income Taxation: BEFIT)[1] and other state taxes in the U.S. and Canada have introduced it.

From a post-pandemic perspective, it can be said that the coronavirus crisis is further promoting the digitization of economic activities and expanding the challenges of origin-based principles. For example, the promotion of remote work is increasing the possibili-

[1] In the past, the introduction of a Common Consolidated Corporate Tax Base (CCCTB) was under consideration, but was withdrawn. Subsequently, a draft BEFIT Directive was published on September 12, 2023.

ty of cross-border employment, which may make it more difficult to identify the "place of origin" in the service sector and other sectors, or may no longer reflect actual conditions.[2]

At this point in time, with the digital taxation settled, there has not yet been sufficient study and analysis of the need for and impact of further radical corporate tax reform. In this report, we will establish criteria for desirable corporate taxation, evaluate the current corporate tax system and each of the proposals for radical reform, and analyze examples of changes in Profit Allocation.

II. Desirable Corporate Taxation Features

Among the principles pertaining to taxation not limited to corporate taxation, the four principles of Adam Smith (fairness, clarity, convenience, and minimum tax collection cost), Wagner's four major principles and nine principles, and Musgrave's seven conditions were mentioned in olden times. In Japan, the three principles of "fair, neutral, and simple" have been regarded as tax principles since the Schaub Recommendation of 1949.

In this paper, we will embody the desirable criteria for corporate taxation, especially corporate income taxation on multinational companies, in light of globalization and digitalization.

II-1. Criteria in Devereux et al. (2021)

In Devereux et al. (2021), which evaluated current corporate taxation and examined and evaluated fundamental corporate tax reform options, five desirable characteristics of corporate taxation in light of globalization and digitalization were identified: (1) fairness, (2) economic efficiency, (3) robustness to avoidance, (4) ease of administration, and (5) incentive compatibility. The criteria have been established.

Regarding the current corporate tax regime, the report highlights several issues. First, the origin-based system creates opportunities for tax avoidance and fuels tax competition among countries. Second, anti-avoidance measures such as transfer pricing rules impose significant administrative burdens on both taxpayers and governments. Finally, the inclusion of both economic rent and normal returns in the tax base distorts investment decisions, affecting the optimal scale of investment.

II-1-1. Fairness

The concept of "fairness" encompasses three dimensions: (1) fairness among individuals, (2) fairness among businesses, and (3) fairness among countries.

With respect to fairness among individuals, the report argues that achieving vertical fairness does not necessarily need to rely solely on corporate taxation. Fairness among busi-

[2] Regarding the relationship between remote work and permanent establishment, the OECD (2021) indicates that an employee's home where remote work is performed is not considered a permanent establishment of the enterprise if it is outside the control of the enterprise.

nesses refers to the principle that competing companies operating in the same market should be subject to fair competition. Lastly, fairness among countries is based on the idea that a state should hold taxing rights as compensation for providing public goods and services to businesses operating within its jurisdiction.

II-1-2. Economic Efficiency

Inefficiencies arising from corporate taxation as a profit-based tax include its impact on (1) the scale of investment and (2) the form of financing. Additionally, another inefficiency is (3) its influence on the choice of business location. To address these issues, it is desirable to design a tax system that minimizes distortions caused by taxation.

II-1-3. Robustness to Avoidance

The tax system should be designed to discourage tax avoidance. While this overlaps with the criteria of fairness, efficiency, and ease of enforcement, robustness to tax avoidance is recognized as an independent criterion, particularly in the context of international taxation.

II-1-4. Ease of Administration

The magnitude of compliance costs and other tax-related procedural expenses for both tax authorities and taxpayers is recognized as a key criterion.

II-1-5. Incentive Compatibility

Although not typically considered a desirable criterion for taxation, it is recognized in the context of international taxation as a criterion addressing the impact on tax competition and related issues between governments. An ideal international tax system would ensure that no nation has an incentive to implement a tax regime that shifts the burden onto other countries.

II-2. Criteria in IMF (2019)

In IMF (2019), which evaluated corporate tax reform options for digital taxation and fundamental corporate tax reform at the time, the desired characteristics of corporate taxation in light of globalization and digitalization are presented.

The current issues with corporate taxation include five criteria: (1) profit shifting and (2) tax competition, for which the report seeks a tax system to prevent, as well as (3) ease of implementation and compliance (Ease of implementation: Practically), (4) legal considerations (Ease of implementation: Legally), and (5) suitability to the circumstances of low-income countries (LICs). These criteria are largely the same as those outlined in Devereux et al. (2021), with the addition of (4) legal considerations.[3]

[3] In Devereux et al. (2021), legal issues such as the relationship with current tax treaties, WTO agreements, etc. are also addressed, but they are not established as independent criteria as a desirable corporate taxation feature.

As a premise of the discussion, the report also indicates that "taxing where value is created" in the BEPS project is neither a perfect nor complete standard for evaluating international tax arrangements. The report notes that economic rent taxation is desirable from the standpoint of efficiency, and that it is difficult to achieve capital export neutrality, capital import neutrality, and capital ownership neutrality with respect to investment location neutrality. It further mentions that there is no agreement on the allocation of the taxing rights of location rents on natural resources, etc. to countries other than the country where they are located.

II-2-1. Protection against Profit Shifting and Tax Competition

Under the current corporate tax system, the prevention of profit shifting and tax competition is established as a key criterion, as these issues have emerged with the progress of digitalization and globalization.

II-2-2. Ease of Implementation: Practically

The magnitude of compliance costs and other tax-related procedural expenses for both tax authorities and taxpayers is established as a key criterion.

II-2-3. Ease of Implementation: Legally

Compatibility with existing bilateral national agreements is established as a criterion from the perspective of the feasibility of the proposed reform options, with particular consideration given to existing bilateral tax treaties, WTO agreements, and other relevant agreements.

II-2-4. Suitability to Circumstances: LICs

The criteria are established to give special consideration to low-income countries, where corporate income tax constitutes a significant portion of total tax revenues and where tax administrations often have limited enforcement capacity.

II-3. Evaluation Criteria in this Paper

Using the criteria established by Devereux et al. (2021) and IMF (2019) as a reference, we will establish the following evaluation criteria for desirable corporate taxation: 1) fairness, 2) economic efficiency, 3) robustness to profit shifting and tax avoidance, 4) robustness to tax competition, and 5) tax compliance costs. Legal issues will also be addressed.

Regarding the DBCFT or RPAI, we will evaluate both scenarios: universal adoption, where all countries adopt the DBCFT or RPAI, and unilateral adoption, where one or a few countries implement these systems. In terms of tax compliance costs, we will assess the advantages and disadvantages for both adopting and non-adopting countries.

II-3-1. Fairness

Fairness will be evaluated in terms of (1) fairness among businesses (i.e., whether the same tax burden is imposed on companies competing in the same market) and (2) fairness among countries (i.e., whether a reasonable tax is collected in exchange for public services provided by the state). Horizontal fairness and vertical fairness among individuals do not need to be achieved solely through corporate taxation. Since income tax methods will also be considered, this paper will not address these topics.

II-3-2. Economic Efficiency

Economic efficiency will be evaluated from three perspectives: (1) the scale of investment, (2) the form of financing, and (3) the choice of location.

II-3-3. Robustness to Profit Shifting and Tax Avoidance

Although this criterion overlaps with equity (especially equity among firms and countries), efficiency (especially the location of investment), and tax compliance cost, it will be established as an independent criterion, similar to Devereux et al. (2021), with international taxation in mind.

We will evaluate whether profit shifting through (1) debt shifting, (2) transfer pricing manipulation, and (3) the location of intellectual property (IP) in low-tax countries—key methods of tax avoidance under the current system—can be addressed. Additionally, we will assess whether new methods of tax avoidance may emerge as a result of introducing fundamental corporate tax reform options, and evaluate measures to address such avoidance.

II-3-4. Robustness to Tax Competition

Criteria will be established as to whether the mechanism is capable of restraining tax competition among countries. In particular, the size of incentives, such as tax rate reductions, to attract businesses will be evaluated.

II-3-5. Tax Compliance Cost

We will evaluate the size of the tax-related administrative burden on both tax authorities and taxpayers under the corporate tax system. The evaluation will focus on the administrative burden at the time the system is implemented, excluding the costs associated with transitioning from the current system.

II-3-6. Legal Issues (Issues and Points to Note)

We will evaluate the need to modify current legal arrangements between states in the case of fundamental corporate tax reform. However, bilateral tax treaties are not the focus of this study, as they are based on the current corporate tax system, and revision would be necessary to implement fundamental tax reform.

II-4. Evaluating the Current Corporate Tax System

We will evaluate the current corporate tax system according to the evaluation criteria established above. In addition to assessing the system as of 2023, we will also evaluate its impact once the revised profit allocation rules (Pillar I) and the global minimum tax (Pillar II) are implemented in each country.

II-4-1. Current Corporate Tax System

(1) Fairness

A. Fairness among companies

Although measures such as rules limiting the deductibility of interest payments and transfer pricing rules have been implemented to address tax avoidance, multinational companies can still avoid taxes, resulting in a lower tax burden compared to companies operating solely in specific countries.

B. Fairness among countries

Taxation is based on the destination principle, resulting in a small allocation to the market country.

(2) Economic Efficiency

A. Scale of investment

The current corporate taxation increases the cost of capital and reduces the scale of investment because it taxes not only economic rent but also normal return. The ACE (Allowance for Corporate Equity), introduced in Italy and other countries even under the origin-based tax, taxes only economic rents and does not distort the scale of investment. Similarly, the introduction of cash flow taxation does not distort the scale of investment.

B. Form of financing

Interest payments are deductible, but dividend payments are not, making debt financing more advantageous. If ACE or CBIT (Comprehensive Business Income Tax), which does not allow interest payments to be deductible, is introduced, corporate tax will no longer serve as a source of finance.

C. Choice of location

The tax burden can be reduced by relocating production to low-tax countries.[4]

(3) Robustness to Profit Shifting and Tax Avoidance

There are several major means of tax avoidance: (1) debt shifting, (2) transfer pricing manipulation, and (3) relocation of IP to low-tax countries. The potential for tax avoidance through (1) debt shifting is effective due to the deduction of interest payments, while tax

[4] According to Feld and Heckemeyer (2011), the median semi-elasticity of outward Foreign Direct Investment (FDI) relative to the effective tax rate is estimated to be 25.

avoidance through (2) transfer pricing manipulation and (3) relocation of IP to low-tax countries is effective due to origin-based taxation. Therefore, measures are being implemented to counter these tax avoidance methods, such as excessive interest payment taxation and transfer pricing rules.

(4) Robustness to Tax Competition

Under the current international tax system, countries can attract companies by reducing corporate tax rates and implementing other measures, which leads to tax competition and a "Race to the Bottom."

(5) Tax Compliance Cost

Under the current corporate tax system, there are cumbersome rules for distinguishing between debt and equity, expenses and assets, depreciation, and so on in the calculation of income. Additionally, transfer pricing rules have been introduced to address tax avoidance, but both companies and tax authorities must deal with an enormous amount of paperwork to comply with these rules.

II-4-2. After Application of Pillar I and Pillar II

The application of Pillar I will reduce profit shifting and tax competition by allocating to market countries the right to tax a portion of the residual profit of some multinational companies.[5] This has advantages in terms of fairness among firms and countries, as well as in terms of its impact on the location of firms. However, its impact is limited due to the very small number of target firms and incomes.

Regarding the application of Pillar II, it will reduce profit shifting and tax competition.[6] This will have benefits in terms of fairness among firms and countries, as well as in terms of its impact on the location of firms. However, when the minimum tax rate is exceeded, tax competition and incentives for profit shifting will persist.

The administrative burden will increase for both tax authorities and taxpayers. Furthermore, there is a trade-off between the increase in tax compliance costs and the "robustness to tax avoidance." When new rules are formulated to address tax avoidance, the administrative burden will further increase for both companies and tax authorities.[7]

As we have seen, the current corporate taxation system is causing certain problems in terms of fairness, efficiency, robustness to tax avoidance, robustness to tax competition, and tax compliance costs. The introduction of Pillar I and Pillar II has led to some alleviation in terms of criteria other than the tax compliance cost, but this does not mean that the problems

[5] The IMF (2023) estimates that a 2% reallocation of Multinational Corporations (MNCs)' profits, primarily from low-tax investment locations to other countries, would increase global corporate income tax revenues by $12 billion.

[6] The IMF (2023) estimates that global corporate income tax revenues would increase by 5.7%, and cross-border profit transfers would decrease by 36%. In addition, the average corporate income tax rate is estimated to rise from 22.2% to 24.3%, and global corporate income tax revenues would increase by 8.1%, as tax competition over corporate income tax rates is eased.

[7] In Oka (2023), the author examines the issue of compliance costs associated with the introduction of a global minimum tax and shows that tax compliance costs are a challenge for Japan in terms of competitive conditions.

have been completely eliminated. Furthermore, the issues related to tax compliance costs have become even greater.

The main factors are thought to be (1) the taxation of normal returns and (2) the adoption of origin-based tax.[8] Fundamental corporate tax reform options have been proposed to address these problems.

III. Destination-Based Cash Flow Taxation (DBCFT)

Destination-Based Cash Flow Taxation (DBCFT) was first proposed by Bond and Devereux (2002) and summarized by the Institute for Fiscal Studies in the UK as part of the "Mirrlees Review" by Auerbach, Devereux, and Simpson (2002), which discusses a VAT-type destination-based corporate cash flow tax. In the U.S., during the discussion of tax reform under the first Trump administration, consideration was given to introducing a DBCFT, but ultimately it was not implemented.

The DBCFT has two key aspects: first, it shifts taxing rights from the origin or residence country to the destination country; second, it is a cash flow tax that allows full deduction of investment expenses at the time of investment, aligning the tax base with cash flows. If DBCFT is adopted globally, the shift to a destination-based tax would address tax avoidance, reduce tax competition, prevent distortions in investment location,[9] and ensure fairness among firms. Additionally, transitioning to a cash flow tax would transform the tax system, eliminating distortions in both the scale of investment and the source of finance. However, this shift would introduce significant deviations from the current corporate tax system, raising issues such as potential conflicts with the WTO Agreement and other international agreements. Moreover, if only one or a few countries adopt this system while others maintain the current corporate tax system, the new approach could worsen fairness, efficiency regarding investment location, and robustness to tax avoidance. Below, we summarize the structure and characteristics of the DBCFT and evaluate it based on the criteria we have set, considering two scenarios: one in which the DBCFT is universally adopted by all countries, and another in which it is introduced by only one or a few countries.

III-1. Structure of the DBCFT

Under the DBCFT, border adjustments similar to those of the current Value Added Tax (VAT) are applied, with imports deducted from losses and exports deducted from gains. Revenues are recorded as income in the country of sale (destination or market country),

[8] Although some countries have adopted residence-based tax rather than origin-based tax as a framework for international taxation, the current corporate tax system is effectively an origin-based tax in any country. This is because even if residence-based tax is formally adopted, the home government cannot actually tax dividends from controlled foreign companies unless they are repatriated to the country (Suzuki, 2020).

[9] Bond and Devereux (2002) reach this conclusion, but Doi (2011) finds that a VAT-type destination-based cash flow corporate income tax is generally not neutral to the international location of firms, but when a foreign government does not impose the tax and only the home government does, it does not affect the international location choices of firms.

while labor and other expenses are deducted in the origin country, thus incorporating both destination-based and origin-based tax elements. Unlike formulary apportionment, the profits of a group of companies are not aggregated; instead, income is calculated on a country-by-country basis, similar to the current corporate tax system.

In addition, the introduction of immediate depreciation and the non-deductibility of interest payments would make cash flows the taxable basis under the DBCFT. According to the Meade Committee (1978), the taxable basis would consist of cash flows arising only from real transactions, excluding financial transactions such as borrowing, repayment, and interest payments.[10]

The transition from the current origin-based and residence-based tax system to a destination-based tax system does not necessarily occur simultaneously with the shift to a cash flow tax base. Examples of countries implementing cash-flow corporate income taxation under the current origin-based and residence-based tax system include Mexico, Estonia, and Macedonia.

Table 1 shows an example comparing the DBCFT with the current corporate income and consumption taxes. Company A operates a manufacturing business in Country A and sells products. Company A purchases some of its intermediate goods from Company B, also based in Country A, with Company B having Company A as its only customer.

Assume that Company A's domestic sales are 350, overseas sales are 150, purchases of intermediate goods from Company B are 200, imports are 100, and labor costs within Country A are 80. Additionally, assume that Company B's labor costs within Country A are 150, and depreciation of facilities is excluded.

In this case, Company A's pretax profits are 120, and Company B's pretax profits are 50. The income under the current corporate income tax base is assumed to be the same amount for both companies. Under the DBCFT, due to border adjustments, only domestic sales are considered for income, while imported intermediate goods are deducted from losses. Therefore, Company A's taxable income is 70, and Company B's taxable income remains at 50.

Assuming a 10% consumption tax rate, the tax amount due for Company A would be 15, and for Company B, it would be 20.

III-2. Characteristics of the DBCFT

III-2-1. Equivalent to a VAT Plus a Matching Subsidy of Tax Reduction for Wages

Assuming there are no reduced or exempt items for VAT and a fixed rate for wage tax, the DBCFT is equivalent to a VAT combined with a matching subsidy that reduces taxes on wages.

[10] Even in the case of the R+F basis (which includes financial transactions such as borrowing, repayment, and interest payments rather than only cash flows arising from real transactions), if the same tax regime applies to both financial institutions and nonfinancial institutions, the tax regime is economically equivalent except for the following points. Exceptions include the following: under the R+F basis, nonfinancial institutions can defer taxation by using their profits for deposits, bond purchases, etc.; under the R+F basis, financial institutions respond differently when lending fees to nonfinancial institutions and charging interest; under the R+F basis, a distinction must be made between debt and equity; under the R basis.

Table 1. Comparison of DBCFT, Current Corporate and Consumption Taxes

			Company A	Company B (Sales to Company A only)
Sales	Domestic sales		350	200
	Overseas sales		150	
	Total sales		***500***	***200***
Costs	Intermediate goods	Domestic goods	200	
		Imported goods	100	
		Total goods	***300***	***0***
	Labor costs		80	150
	Total Costs		***380***	***150***
Pretax Profit			120	50
DBCFT		Gross profits	350 (500-150)	200
		Deductible Expenses	280 (380-100)	150
		Taxable income	70	50
Current Corporate Tax		Gross profits	500	200
		Deductible Expenses	380	150
		Taxable income	120	50
Cousumption Tax @10%		Consumption tax received from the purchaser	35 (350×10%)	20 (200×10%)
		Tax credit amount for taxable purchases	▲21 (300×10%×7/10)	
		Consumption tax refund for export tax exemption	▲9 (300×10%×3/10)	0
		Consumption tax imposed on imported goods	10 (100×10%)	0
		Tax amount due	***15***	***20***
		Amount of Taxable Sales	***150***	***200***

Note: The calculation of the tax credit amount for taxable purchases and the consumption tax refund for export tax exemption are calculated by multiplying the amount of purchases by the ratio of domestic sales and foreign sales to total sales, respectively.
Source: Prepared by author

The tax base for the current VAT can be represented by the three-sided equivalent of GDP:

C (consumption) = W (labor income) + R (capital income) − I (investment) − X (exports) + M (imports)

This can be rearranged as:

C (consumption) − W (labor income) = R (capital income) − I (investment) − X (ex-

ports) + M (imports)

Here, the left-hand side represents the VAT taxable base minus domestic wages. On the right-hand side, (− X + M) represents the border adjustment, and the entire right-hand side forms the taxable base for the DBCFT.

In other words, shifting from the current corporate income tax system to the DBCFT is equivalent to:

1. Repealing the current corporate income tax,
2. Increasing the VAT rate by the current corporate income tax rate,
3. Reducing the tax rate on labor income by the current corporate income tax rate.

For example, in Table 1, assuming a 10% tax rate, the amount of tax paid under the DBCFT is 7 (70 × 10%) for Company A and 5 (50 × 10%) for Company B. This is equivalent to the total increase in tax payments for Company A (15) and Company B (20) due to the 10% increase in the consumption tax rate, minus the decrease in tax payments for Company A's employees (8) and Company B's employees (15) due to the 10% reduction in the labor income tax rate.

III-2-2. Impact on Exchange Rates and Domestic Prices

When only one or a few countries transition to the DBCFT, the border adjustments initially strengthen the international competitiveness of the transitioning country. However, the initial increase in exports and decrease in imports will be offset by exchange rate adjustments in countries with floating exchange rates, and by adjustments in domestic prices and nominal wages in countries with fixed exchange rates.

III-2-3. Recognition of Income on Destination-Based and Expenses on Origin-based

Under the DBCFT, revenues are recorded in the destination country, while expenses are deducted in the origin country. This could potentially encourage companies to locate in high-tax countries. However, as shown in Table 2, even if a particular country raises its tax rate, the location of investment will not affect the company's net income after adjusting for price and exchange rate changes.[11]

III-3. Evaluating the DBCFT

III-3-1. Universal Adoption

(1) Fairness

A. Fairness among companies

Under the DBCFT, taxing rights are allocated to the market country, meaning that companies competing in the same market are subject to the same tax rate. Additionally, as discussed below, the potential for tax avoidance by multinational companies will be reduced compared to the current tax system, as the main tax avoidance mechanisms will be eliminat-

[11] Common expenses are lump sum charged as expenses in the country in which they are incurred.

Table 2. Investment Neutrality of the DBCFT

		Country A	Country B	Total
Panel A ・ at first	DBCFT tax rate	10%	10%	
	Labor costs	60	0	60
	Other costs	40	0	40
	Sales	150	150	300
	DBCFT Tax Base	50	150	200
	DBCFT charge	5	15	20
	Net profit	45	135	180
Panel B ・ Country B tax rate increase ・ No currency adjustment	DBCFT tax rate	10%	25%	
	Labor costs	60	0	60
	Other costs	40	0	40
	Sales	150	150	300
	DBCFT Tax Base	50	150	200
	DBCFT charge	5	37.5	42.5
	Net profit	45	112.5	157.5
Panel C ・ Country B tax rate increase ・ Office relocation ・ No currency adjustment	DBCFT tax rate	10%	25%	
	Labor costs	0	60	60
	Other costs	0	40	40
	Sales	150	150	300
	DBCFT Tax Base	150	50	200
	DBCFT charge	15	12.5	27.5
	Net profit	135	37.5	172.5
Panel D ・ Country B tax rate increase ・ Office relocation ・ Currency adjustment (B currency appreciation)	DBCFT tax rate	10%	25%	
	Labor costs	0	72	72
	Other costs	0	48	48
	Sales	150	180	330
	DBCFT Tax Base	150	60	210
	DBCFT charge	15	15	30
	Net profit	135	45	180
Panel E ・ Country B tax rate increase ・ Currency adjustment (B currency appreciation)	DBCFT tax rate	10%	25%	
	Labor costs	60	0	60
	Other costs	40	0	40
	Sales	150	180	330
	DBCFT Tax Base	50	180	230
	DBCFT charge	5	45	50
	Net profit	45	135	180

Note: The figures are denominated in the currency of Country A. The figures for Patterns C, D, and E indicate the situation where the currency of Country B appreciates in response to a tax rate hike in Country B.
Source: Prepared by author based on example in Devereux et al. (2021)

ed.

B. Fairness among countries

Since revenue is recognized based on the destination principle, while expenses are recognized based on the origin principle, it cannot be said that taxing rights are allocated to the origin country in proportion to the public services it provides. In some cases, businesses with a high export ratio may not be taxed at all, despite benefiting from public services in the country of production. However, for the country as a whole, the overall tax base tends to

be balanced if trade is in equilibrium.[12]

(2) Economic Efficiency

A. Scale of investment

Since only economic rents are taxed under cash flow taxation, no distortion is created in the scale of investment.

B. Form of financing

Since interest payments are not deductible under cash flow taxation, there will be no tax advantages to debt financing, effectively eliminating distortions in the financing structure.

C. Investment location

Even under cash flow taxation, differences in corporate tax rates affect investment location under the origin principle. However, under the destination principle, assuming that final consumers do not move based on tax rates, there is no impact on investment location.

(3) Robustness to Profit Shifting and Tax Avoidance

A. Debt shifting

Since interest payments is not deductible for cash flow tax purpose, there is no profit transfer from the debt shifting between members of the corporate group.

B. Transfer pricing manipulation

Border adjustments prevent tax avoidance through transfer pricing manipulation impossible by ensuring that import and export transactions within a corporate group do not affect taxable income.

C. Relocation of IP to low-tax countries

Border adjustments prevent tax avoidance through the relocation of IP to low-tax countries by ensuring that the purchase or sale of intangible asset rights within a corporate group do not affect taxable income.

(4) Robustness to Tax Competition

As mentioned earlier, as long as the end consumer does not move, there is no connection between the corporate tax rate and the location of companies, eliminating any competition to reduce the tax rate.

(5) Tax Compliance Cost

Under the DBCFT, the various documents and procedures required by the current corporate tax system for income calculation and tax avoidance prevention would no longer be necessary, thus reducing tax compliance costs for both taxpayers and tax authorities.

In the case of R-based cash flow taxation, liabilities and equity are treated neutrally,

[12] In cases where local specific rents are generated, such as natural resource extraction, the transition to DBCFT would transfer this rent to the market country, but a separate tax could be imposed on the natural resources concerned without the pressure of tax competition. However, a separate tax could be levied on the natural resources concerned without the pressure of tax competition.

eliminating the need for rules distinguishing between them. Furthermore, with the introduction of immediate depreciation, there is no need for rules that differentiate between expenses and assets or for calculating the depreciation of individual assets. As for transitioning to a destination-based system, current tax avoidance measures such as transfer pricing rules, thin capitalization rules, and anti-tax haven provisions would become redundant.

However, ensuring an effective enforcement system for border tax adjustments remains a challenge. Specifically, implementing border tax adjustments for intangible assets and services is particularly difficult. Additionally, market countries must cooperate on tax collection, especially for B to C transactions. For example, the introduction of a one-stop-shop system for European Union (EU) VAT[13] could serve as a potential model.

(6) Legal Issues (Issues and Points to Note)

One of the current challenges in transitioning to the DBCFT is the potential conflict with the WTO agreements.[14]

III-3-2. Unilateral Adoption

If only one country or a few countries transition to the DBCFT, the scale of investment and the form of finance within the transitioning country are expected to remain the same as when the system is introduced globally, in terms of efficiency. The evaluation of the scale of investment and the form of finance in non-transitioning countries will remain unchanged.

However, if only one or a few countries were to transition to DBCFT, a situation would arise where some countries would have a zero corporate tax rate under the current origin-based taxation system, while others would maintain their existing corporate tax rates. This would lead to worsened opportunities for tax avoidance compared to the current corporate taxation system, resulting in a decline in both the efficiency of investment location and fairness (both between companies and between countries).[15]

In terms of tax competition, countries that retain the current corporate tax system will be at a disadvantage regarding corporate location and other factors unless they transition to DBCFT. As a result, it is expected that these countries will be compelled to adopt the DBCFT in the medium to long term.

Regarding tax compliance costs, since some countries will transition to the DBCFT

[13] Taxable enterprises register in one of the DBCFT participating countries, and the tax authorities of that country collect taxes at the tax rates of the destination country of export of goods and services, with final settlement among the tax authorities. This system greatly reduces the tax compliance cost on both taxpayers and tax authorities compared to the case where taxable enterprises file tax returns and pay taxes (or receive refunds) in individual countries.

[14] According to Schön (2016), with respect to the elements of the DBCFT, shifting taxing rights from the origin country to the destination country in corporate taxation does not conflict with the WTO Agreement, but "border adjustments" that result in discrimination and export subsidies for imported goods are an issue. Thus, for example, it states that formulaic allocations based solely on sales do not violate the WTO Agreement. Grinberg (2017) also states that an alternative approach that does not conflict with the WTO Agreement is possible by, for example, treating foreign importers and other sellers equally instead of border adjustment, with the tax base being domestic consumption and the number of taxable businesses being expanded.

[15] Investment in countries that maintain origin-based tax is discouraged, and tax revenues are expected to decrease in all but DBCFT transition countries. For example, estimates by Hebous et al. (2019) indicate that if the U.S. were to adopt DBCFT on its own, neighboring countries could lose 40% of tax revenues from MNCs.

while others maintain the current system, companies will need to navigate both systems, which could be more complex than adhering to the current tax system alone. In the transitioning countries, the reduction in administrative burden would be similar to the reduction that would occur if all countries adopted the DBCFT. However, some procedures related to tax avoidance rules may still require ongoing efforts to provide information to non-transitioning countries. Additionally, implementing a one-stop-shop mechanism for exports from non-transitioning countries to transitioning countries would be challenging, and there are issues related to tax collection when the transitioning country is the market country.

For non-transitioning countries, the rules for distinguishing between debt and equity, as well as the rules for distinguishing expenses from assets and calculating depreciation for individual assets, will continue to be necessary. Furthermore, due to increased incentives for tax avoidance by companies, there will likely be a need for stricter application of tax avoidance rules. Additionally, there is a risk that countries transitioning to the DBCFT may be less inclined to cooperate in the automatic exchange of information, such as country-by-country reporting, since there would be little incentive for them to maintain the existing tax avoidance rules.

IV. Formulary Apportionment (FA)

Formulary Apportionment is a method of aggregating income across multiple jurisdictions and allocating it based on specific factors such as sales, assets, and payroll. While it has not yet been widely adopted in international taxation, it is used in U.S. and Canadian state corporate income tax systems. The European Commission is also considering its implementation under the BEFIT initiative. However, the earlier Common Consolidated Corporate Tax Base (CCCTB) proposal was withdrawn without being realized. Additionally, Grace Perez-Navarro, Deputy Director of the OECD's Centre for Tax Policy and Administration, has stated that the use of profit allocation under Pillar I of the digital taxation framework serves as a potential precursor to broader adoption of formulary apportionment.[16]

Since the allocation of taxing rights differs greatly depending on the factor of apportionment, we will evaluate both (1) three equally weighted factors: sales, labor (personnel costs), and assets (a method that was once the mainstream in U.S. state taxes) and (2) a sales-only formula.

IV-1. Structure of the FA

FA involves calculating the total income of companies operating across multiple countries participating in the FA system and allocating it to each country based on predetermined allocation criteria. There are two possible scenarios: (1) all participating countries agree to unify the methods for calculating and allocating total income, or (2) each jurisdiction ap-

[16] Kurihara (2021)

plies its own method independently.

When FA is newly introduced, it is conceivable to standardize the calculation method and the apportionment factors for taxable income among participating countries to prevent both double taxation and double tax exemptions. However, significant conflicts of interest exist among countries, particularly regarding the choice of apportionment factors, making consensus difficult to achieve. Potential factors for allocation include sales, labor, and assets. Within the labor factor, there will be additional disagreement among countries over whether to base it on the number of employees or the cost of labor.

IV-2. Example of Formulary Apportionment (U.S. State Corporate Income Tax)

An example of jurisdictions using their own methods for calculating total income and determining apportionment factors is the U.S. state corporate income tax system. In this system, each U.S. state starts with the federal corporate income of a corporation, makes state-specific adjustments to calculate the tax base, and then apportions the total using its own set of apportionment factors. This approach has led to tax competition among states over the choice of apportionment factors and has also resulted in the same profits being taxed in multiple states.

Originally, the "Massachusetts method," which equally weighs the three factors of assets, labor (labor costs), and sales, was the standard for apportionment. However, in recent years, an increasing number of states have shifted toward a sales-only formula, reflecting a growing emphasis on the sales factor. This shift is a result of tax competition among states over allocation criteria, with states favoring the sales factor to attract businesses. Since sales apportionment does not directly impact a company's location decisions, its increased weight has been seen as a strategic move to promote economic activity without deterring companies from setting up operations.

Recent examples illustrate this trend. Vermont, which historically used a three-factor formula with the sales factor weighted twice, transitioned to a single sales factor formula in January 2023 under state law (S.B. 53). Montana, previously using an equal three-factor apportionment method, amended its formula in 2021 to weight the sales factor twice. Similarly, Alabama shifted from a three-factor formula with double weighting for sales to a single sales factor standard in 2021.

Another recent trend in state corporate income taxation is the withdrawal from the throwback or throwout rule. States allocate corporate taxable income conducted across multiple states using one of three formulas: (1) the three-factor formula, which equally weights assets, labor, and sales; (2) the three-factor formula with the sales factor weighted twice; and (3) the single-factor formula, which considers only sales. Under Public Law 86-272, states are prohibited from taxing sales made within their borders by companies that do not engage in any other activities within the state (i.e., companies without nexus). Consequently, sales in states where a company lacks nexus generate what is referred to as "nowhere income," which remains untaxed by any state.

These issues are addressed by the throwback and throwout rules, which handle income from sales of tangible property in states where the seller lacks nexus. The throwback rule attributes such income back to the numerator of the sales factor in the origin state, and it is applied in approximately 20 states. In contrast, the throwout rule excludes this income from the denominator of the sales factor, effectively removing it from the gross receipts calculation. In summary, the throwback rule adjusts the numerator of the sales factor, while the throwout rule adjusts the denominator.

After 2020, states like Alabama, Louisiana, Missouri, Vermont, and West Virginia have begun to repeal the throwback and throwout rules, with Oklahoma and other states in the process of phasing them out. This move is part of an effort to simplify the corporate tax system and reduce the negative impact on business location decisions. While the impact of these rules on business activity has been minimal for many firms, their repeal is expected to have a more significant effect on smaller manufacturing firms, potentially encouraging them to relocate out of the state due to changes in tax obligations.

This shift reflects a broader trend toward making tax systems more business-friendly, but it could create competitive pressures for states trying to retain or attract businesses, especially those with a high volume of interstate transactions.

IV-3. Evaluating the FA

In the following evaluations, the relationships within or between countries that introduce FAs shall be assumed.

IV-3-1. Three Equally Weighted Factors: Sales, Labor, and Assets

(1) Fairness

A. Fairness among companies

Taxable income is partially taxed in the origin country and partially in the destination country. Regarding the robustness to tax avoidance by multinational companies, it should be noted that, as outlined below, although the main methods of tax avoidance under the current corporate tax system will be eliminated, new means of tax avoidance may still emerge. Therefore, fairness among companies will improve compared to the current system, but it will not be perfect.

B. Fairness among countries

The compensation for public services provided by the state in manufacturing is secured through the allocation of taxable income based on labor and assets in manufacturing. Similarly, the compensation for public services in sales is secured through the allocation of taxable income based on labor, assets, and sales in the sales sector.

(2) Economic Efficiency

A. Scale of investment

As with the current corporate tax system, both economic rents and normal profits will be

taxed, which will reduce the scale of investment.

B. Form of financing

As with the current corporate tax system, interest payments are not deductible, which favors debt finance over equity finance.

C. Investment of location

Taxable income allocated based on labor, assets, and sales factors in the sales process is assigned to the destination country. Assuming that final consumers do not move based on tax rates, this has no impact on the location of investment. Taxable income allocated based on labor and assets in manufacturing is assigned to the origin country, providing an incentive for companies to conduct activities in countries with lower tax rates.

(3) Robustness to Profit Shifting and Tax Avoidance

Debt shifting, transfer pricing manipulation, and the relocation of IP to low-tax countries, which are currently used as means of tax avoidance, will not affect the calculation of total taxable income under the formulary apportionment system. However, the incentive to locate IP in low-tax countries will remain due to their impact on the allocation of taxable income.

(4) Robustness to Tax Competition

Taxable income allocated based on labor, assets, and sales factors in the sales process is assigned to the destination country. Assuming that final consumers do not move based on tax rates, this has no impact on the location of investment. Taxable income allocated based on labor and assets in manufacturing is assigned to the origin country, and each country has an incentive to attract companies by lowering tax rates.

(5) Tax Compliance Cost

The current corporate tax system eliminates the need for various documents and procedures that were established to calculate taxable income and address tax avoidance, thereby reducing the administrative burden on both taxpayers and tax authorities.

On the other hand, many new administrative procedures will be required, such as reporting assets, labor (labor costs), and sales in other countries—information that is not required under the current system. In particular, the implementation of FA will require allocating profits to remote countries for remote sales, which is not required under the current system. In this regard, as with the DBCFT, the introduction of a one-stop-shop mechanism for the EU value-added tax could be considered.

(6) Legal Issues (Issues and Points to Note)

The difference between the current tax treaty approach to taxing rights is problematic. Regarding the relationship with the WTO Agreement, no border adjustment is made, and according to Schön (2016), there is no conflict with the WTO Agreement.

IV-3-2. Sales-Only Formula

(1) Fairness

A. Fairness among companies

All taxable income will be taxed in the destination country. Regarding the potential for tax avoidance by multinational companies, as described below, the main methods of tax avoidance under the current corporate tax system will be eliminated. Therefore, fairness among companies will improve compared to the current system.

B. Fairness among countries

If taxation is based solely on sales, only the destination country has taxing rights. As for the origin country, it cannot be said that taxing rights commensurate with the public services provided by the state are ensured.

(2) Economic Efficiency

A. Scale of investment

As with the current corporate tax system, both economic rents and normal return will be taxed, which will reduce the scale of investment.

B. Form of financing

As with the current corporate tax system, interest payments are not deductible, which favors debt finance over equity finance.

C. Investment of location

Assuming that final consumers do not move based on tax rates, this has no impact on the location of investment.

(3) Robustness to Profit Shifting and Tax Avoidance

Debt shifting, transfer pricing manipulation, and the relocation of IP to low-tax countries, which are currently used as means of tax avoidance, will not affect the calculation of total taxable income under the formulary apportionment system. However, the incentive to locate IP in low-tax countries will remain due to their impact on the allocation of taxable income. Unlike three equally weighted factors, there is no incentive to locate IP in low-tax countries.

(4) Robustness to Tax Competition

Assuming that final consumers do not move based on tax rates, there is no tax competition.

(5) Tax Compliance Cost

The current corporate tax system eliminates the need for various documents and procedures that were established to calculate taxable income and address to tax avoidance, thereby reducing the administrative burden on both taxpayers and tax authorities.

On the other hand, many new administrative procedures will be required, such as reporting sales in other countries—information that is not required under the current system. In

particular, the implementation of FA will require allocating profits to remote countries for remote sales, which is not required under the current system. In this regard, as with the DBCFT, the introduction of a one-stop-shop mechanism for the EU value-added tax could be considered.

V. Residual Profit Allocation by Income (RPAI)

Residual Profit Allocation by Income (RPAI) was proposed in 2019 by Devereux et al. and is one of a family of RPA regimes proposed by Avi-Yonah et al. (2011).

RPA divides the profits of MNCs into routine profit and residual profit. The routine profit is taxed in the country where it is generated, while the residual profit is allocated to each country based on certain rules. This is one of a family of FA regimes mentioned above. Depending on the factors used in the allocation criteria, the allocation of taxable income can vary significantly.[17]

As originally proposed by Avi-Yonah et al. (2011), routine profit was calculated by multiplying costs by a 7.5% mark-up, and the profit in excess of the routine profit was defined as residual profit. The residual profit was to be allocated to each country in proportion to its sales.

The revision of the profit allocation rules (Pillar I) is also one of a family of RPA regimes that allocates a certain percentage of the residual profit of MNCs to each country in proportion to its sales. It differs from the original proposal by Avi-Yonah et al. in that it allocates only a portion, not the entire residual profit, of the applicable companies.

The RPAI proposed by Devereux et al. sets the mark-up rate for routine profit according to the nature of the activity, calculates routine profit, and defines the portion exceeding routine profit as residual profit. Under the RPAI, residual profit is allocated to each country in proportion to the Residual Gross Income (RGI), which is obtained by deducting divisible costs from the sales in each country. Under the RPAI, the allocation of taxable income reflects the profit margin in each country. Compared to the RPA initially proposed by Avi-Yonah et al., the calculation procedure is somewhat more complicated, but it is less economically inefficient and less susceptible to tax avoidance.

RPAI has fewer advantages than DBCFT from the perspective of tax avoidance and tax competition, as there is still an incentive to transfer profits to countries with low-tax rates. However, under RPAI, the taxing right is allocated not only to the destination country but also to the origin country, and the current transfer pricing approach is used to divide routine profit and residual profit. Compared to DBCFT, the deviation from the current corporate tax system is smaller, and it is considered more acceptable to tax authorities and others.

[17] Beer et al. (2023) analyzed the economic impact of RPA based on 8,854 multinational companies and estimated that corporate income tax revenues would increase by 132% in Argentina and 80% in the U.S. for RPA with sales as the coefficient. On the other hand, the U.S. would increase corporate income tax revenues by 35% in the case of RPA with assets as the coefficient of taxable income.

V-1. Structure of the RPAI

Under RPAI, the total profit of the entire corporate group or product line is divided into routine profit and residual profit. For routine profit, a mark-up rate is set for each activity, and the rate is multiplied by the cost of each activity to calculate the profit. Residual profit is calculated by deducting routine profit from total profit.

Residual profit is allocated to the countries where sales to independent third parties are made, using the Residual Gross Income (RGI) of each country as a coefficient. RGI in each destination country is calculated as sales revenue in that country minus all allocable costs,[18] and minus the routine profit associated with those costs.

Residual profit in each country is determined as RGI minus a share of the multinational's total non-allocable costs and the routine profit associated with those costs.

The allocation of residual profit among destination countries can be done in two ways: (1) the bottom-up approach and (2) the top-down approach. In the bottom-up approach, non-allocable costs in each country are subtracted from the RGI of each country. On the other hand, the top-down approach calculates the allocation by multiplying each country's RGI ratio by the total residual profit, which is obtained by subtracting the total routine profit from global profit. The amount of residual profit allocated under either approach is the same (see Table 3). The bottom-up approach is easier for tax authorities and others familiar with transfer pricing practices to apply.

In addition, there are many issues to be coordinated among countries arising from the introduction of RPAI, such as the scope of the corporate group to be consolidated, the calculation unit, and the method for setting the profit rate of routine profit. If there is no coordination among countries, or if coordination is not possible, different rules may be introduced in each country.

V-2. Evaluating the RPAI

The study will be divided into two cases: (1) when all countries adopt a unified standard RPAI, and (2) when only one or a few countries adopt an RPAI or an RPA with different standards.

V-2-1. Universal Adoption

(1) Fairness

A. Fairness among companies

Routine profit is taxed in the origin country, and residual profit is almost entirely taxed in the destination country under RPAI. Regarding the robustness to tax avoidance by multi-

[18] Allocable costs include manufacturing costs and advertising costs in each country, while non-allocable costs include R&D costs, general administrative costs, and advertising costs on a global basis.

national companies, it should be noted that, as outlined below, although the main methods of tax avoidance under the current corporate tax system will be eliminated, new means of tax avoidance may still emerge. Therefore, fairness among companies will improve compared to the current system, but it will not be perfect.

B. Fairness among countries

The taxation of routine profits is secured as compensation for public services provided by the state in manufacturing, while the taxation of residual profits is secured as compensation for public services provided by the state in sales.

(2) Economic Efficiency

A. Scale of investment

As with the current corporate tax system, both economic rents and normal profits will be taxed, which will reduce the scale of investment.

B. Form of financing

As with the current corporate tax system, interest payments are not deductible, which favors debt finance over equity finance.

C. Investment of location

For residual profit, which is allocated to the destination country, assuming that final consumers do not move based on tax rates, this has no impact on the location of investment. Since routine profit is allocated to the origin country, the incentive to conduct business ac-

Table 3. Calculation example of RPAI

			Affiliate in			Total
			A Headquater ,sales	B manufacture,sales	C sales	
Sales	Quantity sold		96	24	80	200
	Price per unit		10	10	15	
	Revenues		***960***	***240***	***1,200***	***2,400***
Costs	Allocable costs incurred by each affiliate	Purchase of intermediate goods		200		200
		Other cost of goods sold		340		340
		Sales & Marketing: Local	200	40	180	420
		Total allocable costs	***200***	***580***	***180***	***960***
	Non-allocable costs incurred by each affiliate	Sales & Marketing: Global	200			200
		General and Administrative (G&A)	100			100
		Research and Development (R&D)	300			300
		Total non-allocable costs	***600***			***600***
	Total Costs		***800***	***580***	***180***	***1,560***
Global Profit						***840***

				Affiliate in			Total
				A Headquater, sales	B manufacture,sales	C sales	
RPAI	Routine profit	Other cost of goods sold (excluding intermediate goods)**(Rate of return:10%)**			34		34
		Sales & Marketing: Local**(Rate of return:5%)**		10	2	9	21
		Sales & Marketing: Global**(Rate of return:5%)**		10			10
		G&A**(5%)**		5			5
		R&D**(Rate of return:10%)**		30			30
		Routine Profit		***55***	***36***	***9***	***100***
	Within-group transactions of goods: cost of goods sold	Allocable costs of intermediate goods		96	24	80	200
		Other allocable costs		144	36	160	340
		Associated routine profit**(Rate of return:10%)**		14.4	3.6	16	34
		Total allocable costs incurred		254.4	63.6	256	574
		Value of transfer		***-254.4***	***510.4***	***-256***	***0***
	Calculating residual gross income	Third party revenues		960	240	1,200	2,400
		allocable costs	Cost of goods sold	254.4	63.6	256	574
			Sales & Marketing: Local (including routine profit)	210	42	189	441
		Residual Gross Income (RGI)(Third party revenues minus allocable costs)		***495.6***	***134.4***	***755***	***1,385***
		Proportion of RGI in each affiliate		***35.80%***	***9.70%***	***54.50%***	***100%***
	Residual profit : bottom- up approach	non- allocable costs	Total				645
			Proportion of RGI	35.80%	9.70%	54.50%	100%
			Apportionment of non- allocable costs	***230.8***	***62.6***	***351.6***	***645***
		Residual Profit (RGI minus non- allocable costs)		***264.8***	***71.8***	***403.4***	***740***
	Residual profit : top-down approach	Total Residual Profit (Global Profit minus Total routine profit)					740
		Residual Profit (Total Residual Profit × Proportion of RGI)		***264.8***	***71.8***	***403.4***	***740***
	Total Profit			***319.8***	***107.8***	***412.4***	***840***
Applying the Avi-Yonah, Clausing	***Routine profit (7.5% of costs)***			***60***	***43.5***	***13.5***	***117***
	Residual profit using sales apportionment			***289.2***	***72.3***	***361.5***	***723***
	Total profit			***349.2***	***115.8***	***375***	***840***
Formulary apportionment based on sales				***336***	***84***	***420***	***840***

Note: Other allocable costs are set at 1.5 for products sold in Country A and B and 2 for products sold in Country C.
Source: Prepared by author based on example in Devereux et al. (2021)

tivities in countries with lower tax rates remains.

(3) Robustness to Profit Shifting and Tax Avoidance

A. Debt shifting

Under RPAI, taxable income is calculated by adding up the income of the entire corporate group and is divided into routine profit and residual profit. There is no profit transfer from debt shifting between members of the corporate group.

B. Transfer pricing manipulation

Under RPAI, taxable income is calculated by adding up the income of the entire corporate group and is divided into routine profit and residual profit. Therefore, transactions within the corporate group do not affect taxable income, and transfer pricing cannot be manipulated.

C. Relocation of IP to low-tax countries

Under RPAI, taxable income is calculated by adding up the income of the entire corporate group and is divided into routine profit and residual profit. Therefore, the relocation of IP do not change the allocation of taxable income.

D. Potential for tax avoidance specific to RPAI

All major tax avoidance methods under the current corporate tax system will no longer be possible under RPAI. However, under RPAI, two new methods of tax avoidance arise: (1) third-party distributors and (2) profit calculation units.

When a multinational company sells products directly to customers located in a high-tax country, it is required to pay tax in the high-tax country and use the RGI calculated based on such sales as a coefficient. On the other hand, if the MNC sells its products to a distributor located outside the MNC group in a low-tax country and then sells them to a high-tax country through that distributor, it can keep the residual profit in the low-tax country (Figure 1).

In addition, if the method of calculating routine profit and residual profit for each product line is adopted as the profit calculation unit, it will be possible to consider combinations of product lines that minimize tax payments, taking into account the profit margin and market location for each product.

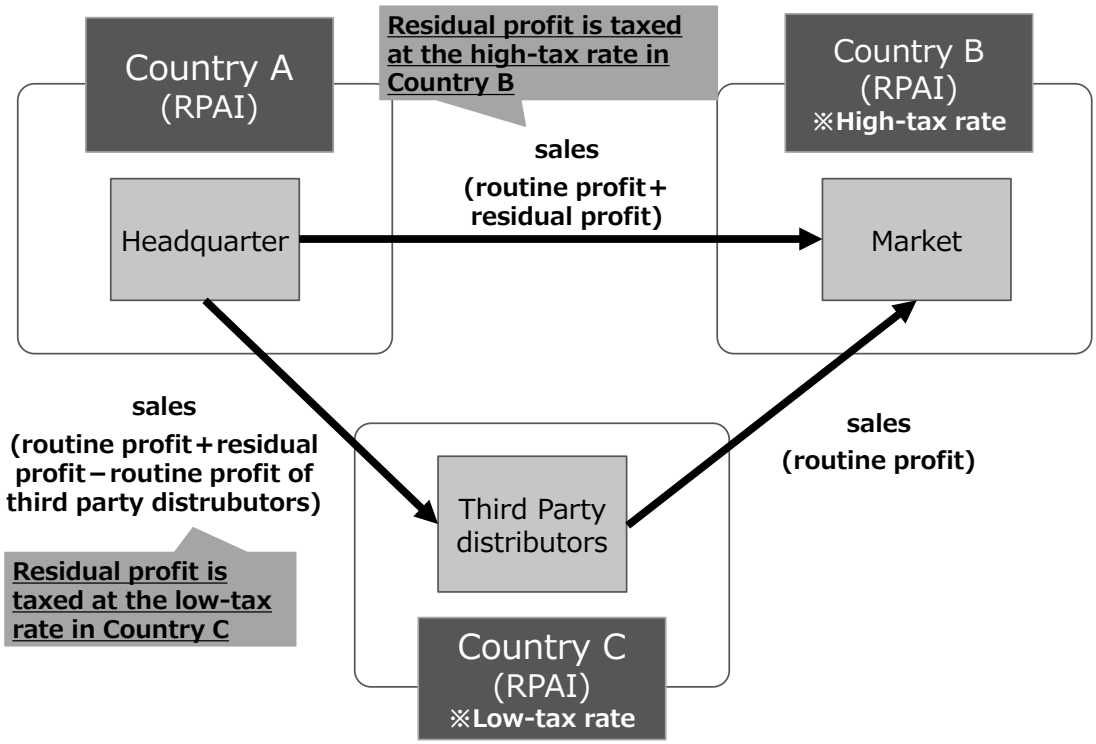
(4) Robustness to Tax Competition

For residual profit, assuming that final consumers do not move according to the tax rate, there will be no tax competition. However, for routine profit, since it is allocated to the origin country, a lower tax rate would attract companies. If different tax rates are set for routine profit and residual profit, the optimal behavior would be to set the tax rate for routine profit to zero and increase the tax rate for residual profit, resulting in a pure destination-based and residual-profit-based taxation system.

(5) Tax Compliance Cost

The current corporate tax system eliminates the need for various documents and procedures established to calculate income and prevent tax avoidance, and is expected to reduce

Figure 1. Tax avoidance through third-party distributors



Source: Prepared by the author

the administrative burden on both taxpayers and tax authorities. However, in implementing RPAI, it will be necessary to allocate taxable income to remote countries for remote sales, which is not required under the current system. In this regard, similar to the DBCFT, a one-stop-shop mechanism for EU value-added tax could be introduced. While the burden of tax collection on routine profit is not high, taxing residual profit will require gathering information on sales, sales volume, allocable costs, and ordinary profits from the corporate group in each market country.

(6) Legal Issues (Issues and Points to Note)

The difference with the current tax treaty approach to taxation right is problematic.

V-2-2. Unilateral Adoption[19]

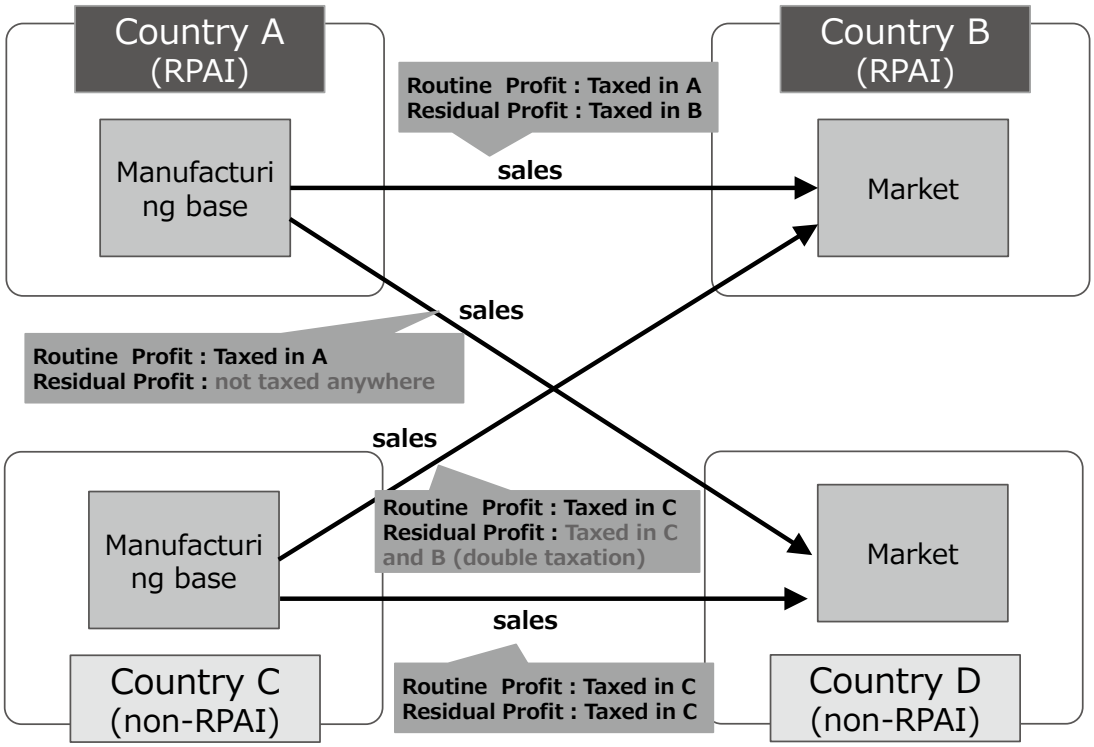
If only one country or a few countries transition to RPAI, the same problems of efficiency, scale of investment, and source of finance will persist in both transitioning and non-transitioning countries, similar to those under the current corporate tax system when applied

[19] The calculation and allocation of income for the entire corporate group in the calculation of RPAI is assumed to be in a form that includes locations in countries that do not introduce RPAI.

globally.

If a company manufactures in an RPAI country and sells in a non-RPAI country, the residual profit from sales in the non-RPAI country is not taxed by either the RPAI or the non-RPAI country. This creates a tax advantage for relocating manufacturing operations in an RPAI country (Figure 2). Consequently, distortions in investment location decisions may be exacerbated.[20]

Figure 2. If only one or a few countries move to RPAI - Impact on efficiency of investment location



Source: Prepared by the author

The implementation of RPAI may increase the incentive for profit shifting from non-RPAI countries to RPAI countries through strategies such as debt shifting, transfer pricing manipulation, and the relocation of IP in low-tax countries.

In terms of tax compliance costs, the coexistence of RPAI countries and those retaining the current corporate tax system would compel companies to operate under both frameworks simultaneously. This dual system is likely to lead to higher compliance costs compared to the current tax system.

In transition countries, various documents and procedures previously established for income calculation and tax avoidance control will no longer be required. However, the alloca-

[20] There is a possibility that non-introducing countries will oppose this by reducing tax rates, etc.

tion of taxable income to remote countries for sales in remote areas will become a new requirement for calculating taxable income. Unlike a scenario where all countries adopt RPAI, obtaining cooperation from tax authorities in non-RPAI countries is expected to be challenging. This includes difficulties in accessing necessary information and implementing a one-stop-shop mechanism that encompasses both RPAI and non-RPAI countries.

For non-transitioning countries, there will be no significant change in tax compliance costs or procedures under the current tax system. However, stricter enforcement of tax avoidance rules is likely to be required due to increased incentives for tax avoidance by companies. Furthermore, regarding the automatic exchange of information, such as country-by-country reporting, transitioning countries may have reduced incentives to continue these practices under RPAI, potentially making it more difficult to secure cooperation from those countries.

VI. Comparison of Corporate Tax Reform Options and Future Direction

VI-1. Corporate Tax Reform Options and Allocation of Taxable Income

As outlined above, under the current corporate tax system, overall taxable income is allocated entirely to the origin country. Under RPAI, RPA, FA (using three equally weighted factors: sales, labor, and assets), and the current corporate tax system after the introduction of Pillar I, taxable income is allocated between the origin country and the destination country. In contrast, under DBCFT and FA (100% sales), taxable income is allocated exclusively to the destination country.

If exports and imports are balanced, the change in the tax base resulting from border adjustments will offset at the national level, leaving the overall tax base unchanged under the DBCFT. However, at the individual company level, the actual allocation ratio and the impact of the tax system change will vary depending on factors such as the company's profit margin, cost structure, and the relative size of its headquarters, manufacturing, and market functions across countries.

Under RPAI/RPA, the tax base impact for each country is expected to differ based on the profit margins of companies with manufacturing operations in those countries. For countries hosting companies with high profit margins at their manufacturing bases, a shift from the current corporate tax system to RPAI/RPA is likely to result in a significant reduction in the tax base. Conversely, for countries hosting companies with lower profit margins at their manufacturing bases, the transition to RPAI/RPA is unlikely to have a substantial impact, even at the individual company level.

Below, we calculate the allocation percentages using specific examples of multinational companies and examine the changes in taxable income allocated to individual countries. For simplicity, the following common assumptions are applied to the calculations.

Common condition	●Each multinational company has one headquarters and several subsidiaries located in different countries. ●The headquarters and subsidiaries pay corporate taxes to the countries in which they are located. ●All countries adopt the territorial system. ●Non-allocable expenses for multinational companies are allocated to each country based on gross profit. In addition, we have also calculated the DB-CFT case where all expenses are recorded at the location where they are incurred. ●Regarding production, the first priority is to sell products domestically, and any production in excess of domestic sales is sold to other countries through inter-group transactions. ●Prices on inter-group transactions are calculated based on the resale price method.[21] However, calculations based on the cost plus method[22] are also carried out for reference. ●In the case of RPAI/RPA, if the total profit is less than the routine profit, the total profit is calculated as the routine profit. ●The routine profit mark-up rate for RPAI is 10% (of other costs and R&D expenses), and 5% (of advertising, general and administrative expenses). The routine profit mark-up rate for RPA is 7.5%. ●In FA (three-factor equalization), assets are defined as the amount of property, plant, and equipment, and labor is defined as the labor costs. ●The import ratio for intermediate goods is 50%, and the export ratio for third-party sales is 0%. ●Changes in prices and other changes in corporate behavior due to tax reform are not taken into account.

The details of the conditions and results for each case are discussed in the supplementary section. Based on the trial calculations (Tables 4 and 5), we can observe that in countries where high-profit companies have bases, applying the current corporate tax system results in the highest allocation of taxable income. Under RPAI, the taxable income allocated significantly decreases (Cases 1, 5, and 6). Conversely, in countries where low-profit companies have bases, the amount of allocated taxable income remains relatively unchanged when transitioning from the current corporate tax system to RPAI (Cases 2 and 3).

In countries where the difference between the sales ratio and the manufacturing ratio is large, the impact of border adjustments will be significant, and a refund may occur upon the introduction of DBCFT. In cases of high profits, there are cases where a refund does not occur, even when the difference between the sales ratio and the manufacturing ratio is large (Case 5).

[21] The profit margin of the sales company is calculated using the following formula.
Operating profit margin of the overall company × ratio of the sales company's expenditure on the manufacturing cost and sales and general administrative expenses related to the traded goods.

[22] The profit ratio of the manufacturing company is calculated as the return on cost of the overall company.

Table 4. Cases Related to Allocation of Taxable Income (1)

	Company profile	Earnings	Allocation of taxable income
Case 1	・ A multinational manufacturing company that produces high-value-added products only in the country where its headquarters is located. ・ It has subsidiaries in foreign countries that are responsible for sales functions only. Sales in foreign countries are conducted through these subsidiaries. ・ It generates 90% of sales from countries other than the country where the headquarters is located. ・ The overall gross profit margin for the company is 77.5%. ・ Further high-value-added products are sold in only one foreign country.	High Profit Margin (Operating profit margin is 35.0%)	・ Under the current corporation tax system, 84% of taxable income is allocated to the country where the headquarters is located. ・ With the introduction of RPAI, the allocation ratio for the country where the headquarters is located is reduced to 18% (when RPA is introduced, it is 19%, almost the same as when RPAI is introduced). ・ The introduction of DBCFT has resulted in a negative income (refund) in the country where the headquarters is located.
Case 2	・ A multinational manufacturing company that produces low-value-added products only in the country where its headquarters is located. ・ It has subsidiaries in foreign countries that are responsible for sales functions only. Sales in foreign countries are conducted through these subsidiaries. ・ It generates 90% of sales from countries other than the country where the headquarters is located. ・ The overall gross profit margin for the company is 52.5%. ・ High-value-added products are sold in only one foreign country.	Low Profit Margin (Operating profit margin 10.0%)	・ Under the current corporation tax system, 84% of taxable income is allocated to the country where the headquarters is located. ・ With the introduction of RPAI, the allocation ratio for the country where the headquarters is located is reduced to 38% (when RPA is introduced, it is 59%). ・ The introduction of DBCFT has resulted in a negative income (refund) in the country where the headquarters is located.
Case 3	・ A multinational manufacturing company that produces low-value-added products both in the country where its headquarters is located and each market country. ・ It manufactures more products than it sells in the country where its headquarters is located and sells the difference in market countries. ・ It manufactures 44.2% of products in the country where the headquarters is located. ・ It generates 22.2% of sales from country where the headquarters is located. ・ The overall gross profit margin for the company is 17.5%.	Low Profit Margin (Operating profit margin 6.4%)	・ Under the current corporation tax system, 41% of taxable income is allocated to the country where the headquarters is located. ・ With the introduction of RPAI, the allocation ratio for the country where the headquarters is located is reduced to 35% (when RPA is introduced, it is 44%). There is no significant change in other countries. ・ The introduction of DBCFT has resulted in a negative income (refund) in the country where the headquarters is located.

Source: Prepared by the author

Table 5. Cases Related to Allocation of Taxable Income (2)

	Company profile	Earnings	Allocation of taxable income
Case 4	・ A multinational manufacturing company that produces middle-value-added products both in the country where its headquarters is located and each market countries. ・ It manufactures more products than it sells in the country where its headquarters is located and in other manufacturing bases and sells the difference in market countries. ・ It manufactures 36.3% of products in the country where the headquarters is located and 45.8% in other manufacturing base countries. ・ It generates 23.8% of sales from the country where the headquarters is located and 29.5% in other manufacturing base countries. ・ The overall gross profit margin for the company is 36.2%.	Middle Profit Margin (Operating profit margin 17.1%)	・ Under the current corporation tax system, 33% of taxable income is allocated to the country where the headquarters is located and 42% of taxable income is allocated to other manufacturing bases. ・ With the introduction of RPAI, the allocation ratios for the country where the headquarters is located and for other manufacturing base countries are reduced to 27% and 33% (when RPA is introduced, these are 29%, 34%). There is no significant change in other countries. ・ The introduction of DBCFT has led to a significant decline in taxable income in the country where the headquarters is located and in other manufacturing base countries.
Case 5	・ A multinational manufacturing company that produces high-value-added products both in the country where its headquarters is located and each market country. ・ It manufactures 83.3% of products in the country where the headquarters is located. ・ It generates 43.0% of sales from the country where the headquarters is located. ・ The overall gross profit margin for the company is 44.0%.	High Profit Margin (Operating profit margin 30.9%)	・ Under the current corporation tax system, 79% of taxable income is allocated to the country where the headquarters is located and 42% of taxable income is allocated to other manufacturing base. ・ With the introduction of RPAI, the allocation ratio for the country where the headquarters is located is reduced to 48% (when RPA is introduced, it is 50%). In all other countries, it will increase. ・ The introduction of DBCFT has led to a significant decline in taxable income in the country where the headquarters is located.
Case 6	・ A multinational IT company that develops and builds a high-value-added digital service system in the country where its headquarters is located. ・ Service development and construction is carried out only in the country where its headquarters is located. ・ It has subsidiaries in foreign countries that are responsible for sales functions only. Sales in foreign countries are conducted through these subsidiaries. ・ It generates 48.2% of sales from country where the headquarters is located. ・ The overall gross profit margin for the company is 55.4%.	High Profit Margin (Operating profit margin is 27.0%)	・ Under the current corporation tax system, 94% of taxable income is allocated to the country where the headquarters is located. ・ With the introduction of RPAI, the allocation ratio for the country where the headquarters is located is reduced to 55% (when RPA is introduced, it is 56%). In all other countries, it will increase. ・ The introduction of DBCFT has resulted in a negative income (refund) in the country where the headquarters is located.

Source: Prepared by the author

VI-2. Evaluation of Corporate Tax Reform Options

The current corporate tax system (both the existing system and the system after an agreement is reached on digital taxation), DBCFT, FA (with equal distribution of the three factors: sales, labor, and assets), FA (with 100% sales), and RPAI are compared based on the criteria outlined in Table 6.

Regarding the issues with the current corporate tax system, fairness among companies and countries, profit shifting, and tax competition may be partially resolved with the introduction of Pillars I and II. However, there is still room for improvement, as profit shifting and tax competition cannot be fully addressed, and the tax compliance cost is expected to rise.

The DBCFT is considered the most effective solution to the challenges of the current corporate tax system. However, if only one or a few countries initially adopt the DBCFT, it is assumed that profit shifting and tax competition will be exacerbated. As a result of tax competition, other countries will be forced to adopt the DBCFT, and it is expected that eventually, all countries will implement it. Therefore, the issue of only one or a few countries adopting the DBCFT is seen as a transitional phase, until all countries adopt it. Additionally, in order to implement the DBCFT, it is important to consider not only the revision of tax treaties but also its relationship with the WTO Agreement. Both philosophically and practically, significant changes will be required from the current corporate tax system.

Unlike the DBCFT, the RPAI does not limit the tax base to economic rent nor restrict deductions for interest payments, so it does not address the efficiency issues related to the scale of investment and the source of finance. Additionally, the RPAI leaves room for profit shifting and tax competition with respect to routine profits, meaning it cannot resolve all problems of the current tax system. However, it aligns with the principle of fairness among countries, as it preserves the taxing rights of both destination and origin countries. Moreover, it does not represent a drastic change from the current corporate tax system. Regarding the Pillar I, elements similar to the RPAI have been incorporated for certain companies.

VII. Conclusion

We have evaluated the DBCFT and RPAI, which are proposed as fundamental corporate tax reforms, as well as the current corporate tax system and corporate tax system after the introduction of digital taxation, from the perspective of a desirable corporate tax system. Based on this evaluation, we would like to highlight two additional points.

The first point is the need for international coordination. Whether the DBCFT or RPAI is introduced in one country or only a few countries, it will exacerbate tax avoidance and tax competition compared to the current corporate tax system, while also imposing a burdensome tax compliance cost on taxpayers. In cases where there is a significant divergence from the current corporate tax system and the allocation of taxable income is expected to

Table 6. Corporate Tax Reform Options to Solve Current Tax Issues

			Fairness		Economic efficiency			Robustness to tax avoidance	Robustness to tax competition	Tax compliance cost
			business-to-business	cross-national	Scale of Investment	Location	Form of financing			
Introduction of Pillar I and Pillar II + current tax system			○	○	△	○	△	○	○	×
Fundamental corporate tax reform options	DBCFT	Universal adoption	◎	△	◎	○	◎	◎	◎	○
		Unilateral adoption	△-×	△-×	◎	△-×	◎	△-×	△-×	△-× (Company) ○-× (transition countries) △-× (Non-migrating countries)
	FA	Three equally weighted factors: sales, labor, and assets	○-△	○	△	○-△	△	○	○	○-×
		Sales-only formula	◎	△	△	○	△	◎	◎	○
	RPAI	Universal adoption	○	○	○	○	△	○	○	○-△
		Unilateral adoption	△-×	△-×	○	△-×	△	△-×	△-×	△-× (Company) ○-× (transition countries) △-× (Non-migrating countries)

Note 1: ◎: Significant improvement compared to the current tax system, ○: Improvement compared to the current tax system △: Equal to the current tax system or no change measurable, ×: Worse than the current tax system.
Note 2: The fairness and efficiency (scale of investment and means of financing) of the introduction of a one country or a few countries are evaluated within the country of introduction. As for the tax compliance cost, the evaluation is made for enterprises, transition countries, and non-transition countries, respectively. For companies, it is assumed that they are operating in both transition and non-migration countries.
Note 3: For RPAI, different tax rates are assumed to be applied between routine profit and residual profit.

differ considerably, coordination among countries will become even more challenging. Additionally, when allocating taxable income to the destination country, a mechanism similar to the one-stop shop in the EU could be introduced, but careful consideration would also be required for implementing such a mechanism.

The second point is the tax compliance cost during the reform process and its impact on changes in tax payments and tax revenues. A system that deviates significantly from the current corporate tax system will incur substantial costs during the transition, including system revisions, changes in administrative processes, and the need to update the knowledge of tax staff. Additionally, the amount of tax payments for taxpayers and tax revenue for tax authorities and the government will change significantly.

Regarding the future direction of corporate taxation, fundamental corporate tax reform options will not be implemented immediately. Instead, practical issues and the resolution of challenges facing the current corporate tax system will be addressed after the introduction and establishment of digital taxation. If fundamental corporate tax reform options are deemed necessary, the scope of RPA introduction will be expanded as an extension of Pillar I, and the introduction of RPAI will be considered in the future. If further reform is deemed necessary, the introduction of the DBCFT will be discussed within the framework of an international agreement.

References

Avi-Yonah, R. S., & Benshalom, I. (2011). "Formulary apportionment: Myths and prospects—Promoting better international policy and utilizing the misunderstood and under-theorized formulary alternative." World Tax Journal, 3(3), 37-198.

Beer, S., de Mooij, R. A., Hebous, S., Keen, M., & Liu, L. (2023). "Exploring residual profit allocation." American Economic Journal: Economic Policy, 15(1), 70-109.

Bond, S. R., & Devereux, M. P. (2002). "Cash flow taxes in an open economy." CEPR Discussion Paper, No. 3401.

de Mooij, R. A., Liu, L., & Prihardini, D. (2019). "An assessment of global formula apportionment." IMF Policy Paper, No. 2019/213.

Devereux, M. P., Auerbach, A. J., Keen, M., Oosterhuis, P., Schön, W., & Vella, J. (2021). Taxing profit in a global economy. Oxford University Press.

Doi, T. (2011). "An economic analysis of destination-based corporate taxation." Financial Review, 102, 128-145.

European Commission. (2016). "Council directive on a common corporate tax base." https://taxation-customs.ec.europa.eu/system/files/2016-10/com_2016_685_en.pdf

Feld, L. P., & Heckemeyer, J. H. (2011). "FDI and taxation: A meta-study." Journal of Economic Surveys, 25(2), 233-272.

Grinberg, I. (2017). "A destination-based cash flow tax can be structured to comply with World Trade Organization rules." National Tax Journal, 70(4), 803-818.

Hebous, S., Klemm, A. D., & Stausholm, S. (2019). "Revenue implications of destina-

tion-based cash-flow taxation." IMF Policy Paper, No. 2019/007.
IMF. (2019). "Corporate taxation in the global economy." IMF Policy Paper, No. 2019/007.
IMF. (2023). "International corporate tax reform." IMF Policy Paper, No. 2023/001.
Institute for Fiscal Studies (IFS), & Mirrlees, J. (Eds.). (2011). Tax by design: The Mirrlees Review. Oxford University Press.
Kurihara, K. (2021). "On the principle of independent enterprise (ALP) and formal allocation." Tsukuba Law Journal, 31, 1-38.
Meade Committee. (1978). "The structure and reform of direct taxation: Report of a committee chaired by Professor J. E. Meade." Institute for Fiscal Studies.
OECD. (2021). "Updated guidance on tax treaties and the impact of COVID-19 pandemic."
Oka, N. (2023). "Considering the tax compliance cost of a 15% global minimum tax." https://www.tkfd.or.jp/research/detail.php?id=4273
Schön, W. (2016). "Destination-based income taxation and WTO law: A note." In H. Jochum, P. Essers, M. Lang, N. Winkeljohann, & B. Wiman (Eds.), Practical problems in European and international tax law: Essays in honour of Manfred Mössner (pp. 429-451). IBFD.
Suzuki, M. (2020). "Future corporate tax direction." In Securities Taxation Study Group (Ed.), Recent Developments in Corporate Taxation (pp. 173-206). Japan Securities Research Institute. https://www.jsri.or.jp/publish/general/pdf/g29/07.pdf
Tax Foundation. (2023). "State tax changes taking effect January 1, 2023." https://taxfoundation.org/research/all/state/2023-state-tax-changes/

Addendum

This section presents the case details for the analysis of corporate tax reform proposals and the allocation of taxable income discussed in Section VI-1. Case 1 refers to the example in Table 3, where the manufacturing base and the headquarters are located in the same country. Case 2 is a variation of Case 1, with an increase in the price of intermediate goods among the manufacturing costs.

(1) Case 1

Setting the conditions for corporate activities

			Case1 Headquarters : Country A				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		2,500.0	500.0	500.0	0.0	3,500.0
Manufacture	Quantity produced		200.0	0.0	0.0	0.0	200.0
	Intra-group transactions		176.0	-96.0	-80.0	0.0	0.0
Sales	Quantity sold		24.0	96.0	80.0	0.0	200.0
	Price per unit		10.0	10.0	15.0	0.0	
	Revenues		240.0	960.0	1,200.0	0.0	2,400.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	1.0	1.0	1.0	0.0	
		Other cost of goods sold	1.5	1.5	2.0	0.0	
	Allocable costs	Purchase of intermediate goods	200.0	0.0	0.0	0.0	200.0
		Other cost of goods sold	340.0	0.0	0.0	0.0	340.0
		Sales & Marketing: Local	40.0	200.0	180.0	0.0	420.0
		Total allocable costs	580.0	200.0	180.0	0.0	960.0
	Non- allocable costs	Sales & Marketing: Global	200.0	0.0	0.0	0.0	200.0
		General and Administrative (G&A)	100.0	0.0	0.0	0.0	100.0
		Research and Development (R&D)	300.0	0.0	0.0	0.0	300.0
		Total non- allocable costs	600.0	0.0	0.0	0.0	600.0
	Cost of goods sold		540.0	0.0	0.0	0.0	540.0
	Sales, General and Administrative Expenses		640.0	200.0	180.0	0.0	1,020.0
	Labor costs(included in the above amount)		190.0	600.0	90.0	0.0	880.0
	Total costs		1,180.0	200.0	180.0	0.0	1,560.0
Operating income (consolidated)							840.0
Indicators	**Sales ratio by country (group-wide)**		10.0%	40.0%	50.0%	0.0%	100.0%
	Cost ratio by country (group-wide)		75.6%	12.8%	11.5%	0.0%	100.0%
	Asset ratio by country (group-wide)		71.4%	14.3%	14.3%	0.0%	100.0%
	Labor costs ratio by country (group-wide)		21.6%	68.2%	10.2%	0.0%	100.0%
	Gross profit margin (excluding internal profits)		75.0%	75.0%	80.0%		77.5%
	Operating profit margin						35.0%
	Return on costs (Gross profit／Total Cost)						53.8%

Source: Prepared by the author

Profit Allocation

		Case1 Headquarters : Country A				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	707.0	70.0	63.0	0.0	840.0
	Current Corporate tax+Pillar1	580.2	124.2	135.7	0.0	840.0
	DBCFT① (Allocate non- allocable costs based on gross profit)	-595.7	631.4	904.3	0.0	940.0
	DBCFT② (All non- allocable costs are recorded at the location where they are incurred)	-840.0	760.0	1,020.0	0.0	940.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	288.5	342.9	208.6	0.0	840.0
	Formulary apportionment(sales-only formula)	84.0	336.0	420.0	0.0	840.0
	RPAI	152.8	274.8	412.4	0.0	840.0
	RPA(Avi-Yonah)	160.8	304.2	375.0	0.0	840.0
	Current Corporate tax（Cost plus Method)	257.0	200.2	382.8	0.0	840.0
	Current Corporate tax+Pillar1（Cost plus Method)	221.8	227.8	390.4	0.0	840.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	-381.4	569.4	752.0	0.0	940.0

Source: Prepared by the author

(2) Case 2

Setting the conditions for corporate activities

			Case2 Headquarters : Country B				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		500.0	2,500.0	500.0	0.0	3,500.0
Manufacture	Quantity produced		0.0	200.0	0.0	0.0	200.0
	Intra-group transactions		-96.0	176.0	-80.0	0.0	0.0
Sales	Quantity sold		96.0	24.0	80.0	0.0	200.0
	Price per unit		10.0	10.0	15.0	0.0	
	Revenues		960.0	240.0	1,200.0	0.0	2,400.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	4.0	4.0	4.0	0.0	
		Other cost of goods sold	1.5	1.5	2.0	0.0	
	Allocable costs	Purchase of intermediate goods	0.0	800.0	0.0	0.0	800.0
		Other cost of goods sold	0.0	340.0	0.0	0.0	340.0
		Sales & Marketing: Local	200.0	40.0	180.0	0.0	420.0
		Total allocable costs	200.0	1,180.0	180.0	0.0	1,560.0
	Non- allocable costs	Sales & Marketing: Global	0.0	200.0	0.0	0.0	200.0
		General and Administrative (G&A)	0.0	100.0	0.0	0.0	100.0
		Research and Development (R&D)	0.0	300.0	0.0	0.0	300.0
		Total non- allocable costs	0.0	600.0	0.0	0.0	600.0
	Cost of goods sold		0.0	1,140.0	0.0	0.0	1,140.0
	Sales, General and Administrative Expenses		200.0	640.0	180.0	0.0	1,020.0
	Labor costs(included in the above amount)		600.0	190.0	90.0	0.0	880.0
	Total costs		200.0	1,780.0	180.0	0.0	2,160.0
Operating income (consolidated)							240.0
Indicators	**Sales ratio by country (group-wide)**		40.0%	10.0%	50.0%	0.0%	100.0%
	Cost ratio by country (group-wide)		9.3%	82.4%	8.3%	0.0%	100.0%
	Asset ratio by country (group-wide)		14.3%	71.4%	14.3%	0.0%	100.0%
	Labor costs ratio by country (group-wide)		68.2%	21.6%	10.2%	0.0%	100.0%
	Gross profit margin (excluding internal profits)		45.0%	45.0%	60.0%		52.5%
	Operating profit margin						10.0%
	Return on costs (Gross profit／Total Cost)						11.1%

Source: Prepared by the author

Profit Allocation

		Case2 Headquarters : Country B				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	20.0	202.0	18.0	0.0	240.0
	Current Corporate tax+Pillar1	21.9	197.6	20.6	0.0	240.0
	DBCFT① (Allocate non- allocable costs based on gross profit)	560.0	-760.0	840.0	0.0	640.0
	DBCFT② (All non- allocable costs are recorded at the location where they are incurred)	760.0	-1,140.0	1,020.0	0.0	640.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	98.0	82.4	59.6	0.0	240.0
	Formulary apportionment(sales-only formula)	96.0	24.0	120.0	0.0	240.0
	RPAI	47.0	92.1	100.8	0.0	240.0
	RPA(Avi-Yonah)	46.2	141.3	52.5	0.0	240.0
	Current Corporate tax (Cost plus Method)	-4.4	75.2	169.2	0.0	240.0
	Current Corporate tax+Pillar1 (Cost plus Method)	-1.9	74.0	168.0	0.0	240.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	582.2	-644.8	702.5	0.0	640.0

Source: Prepared by the author

(3) Case 3

Setting the conditions for corporate activities

			Case3 Headquarters : Country B				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		36,666.7	73,333.3	26,666.7	13,333.3	150,000.0
Manufacture	Quantity produced		2,000.0	4,000.0	2,000.0	1,000.0	9,000.0
	Intra-group transactions		-500.0	2,000.0	0.0	-1,500.0	0.0
Sales	Quantity sold		2,500.0	2,000.0	2,000.0	2,500.0	9,000.0
	Price per unit		4.0	4.0	4.0	4.0	
	Revenues		10,000.0	8,000.0	8,000.0	10,000.0	36,000.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	2.0	2.0	2.0	2.0	
		Other cost of goods sold	1.3	1.3	1.3	1.3	
	Allocable costs	Purchase of intermediate goods	4,000.0	8,000.0	4,000.0	2,000.0	18,000.0
		Other cost of goods sold	2,600.0	5,200.0	2,600.0	1,300.0	11,700.0
		Sales & Marketing: Local	600.0	550.0	600.0	550.0	2,300.0
		Total allocable costs	7,200.0	13,750.0	7,200.0	3,850.0	32,000.0
	Non- allocable costs	Sales & Marketing: Global	0.0	200.0	0.0	0.0	200.0
		General and Administrative (G&A)	0.0	300.0	0.0	0.0	300.0
		Research and Development (R&D)	600.0	600.0	0.0	0.0	1,200.0
		Total non- allocable costs	600.0	1,100.0	0.0	0.0	1,700.0
	Cost of goods sold		6,600.0	13,200.0	6,600.0	3,300.0	29,700.0
	Sales, General and Administrative Expenses		1,200.0	1,650.0	600.0	550.0	4,000.0
	Labor costs(included in the above amount)		1,520.0	2,860.0	1,280.0	740.0	6,400.0
	Total costs		7,800.0	14,850.0	7,200.0	3,850.0	33,700.0
Operating income (consolidated)							2,300.0
Indicators	**Sales ratio by country (group-wide)**		27.8%	22.2%	22.2%	27.8%	100.0%
	Cost ratio by country (group-wide)		23.1%	44.1%	21.4%	11.4%	100.0%
	Asset ratio by country (group-wide)		24.4%	48.9%	17.8%	8.9%	100.0%
	Labor costs ratio by country (group-wide)		23.8%	44.7%	20.0%	11.6%	100.0%
	Gross profit margin (excluding internal profits)		17.5%	17.5%	17.5%	17.5%	17.5%
	Operating profit margin						6.4%
	Return on costs (Gross profit／Total Cost)						6.8%

Source: Prepared by the author

Profit Allocation

		Case3 Headquarters : Country B				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	579.1	933.0	422.2	365.7	2,300.0
	Current Corporate tax+Pillar1	579.1	933.0	422.2	365.7	2,300.0
	DBCFT① (Allocate non- allocable costs based on gross profit)	4,364.3	-2,298.1	2,422.2	6,811.6	11,300.0
	DBCFT② (All non- allocable costs are recorded at the location where they are incurred)	4,200.0	-2,850.0	2,800.0	7,150.0	11,300.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	582.5	887.8	460.0	369.8	2,300.0
	Formulary apportionment(sales-only formula)	638.9	511.1	511.1	638.9	2,300.0
	RPAI	604.8	812.7	453.4	429.1	2,300.0
	RPA(Avi-Yonah)	532.3	1,013.5	491.4	262.8	2,300.0
	Current Corporate tax（Cost plus Method)	595.6	801.1	422.2	481.1	2,300.0
	Current Corporate tax+Pillar1（Cost plus Method)	595.6	801.1	422.2	481.1	2,300.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	4,358.2	-2,249.3	2,422.2	6,768.9	11,300.0

Source: Prepared by the author

(4) Case 4

Setting the conditions for corporate activities

			Case4 Headquarters : Country B				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		2,400.0	1,900.0	35.0	900.0	5,235.0
Manufacture	Quantity produced		3,209.2	2,540.6	46.8	1,203.4	7,000.0
	Intra-group transactions		1,142.5	873.9	-486.5	-1,529.9	0.0
Sales	Quantity sold		2,066.7	1,666.7	533.3	2,733.3	7,000.0
	Price per unit		1.5	1.5	1.5	1.5	
	Revenues		3,100.0	2,500.0	800.0	4,100.0	10,500.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	0.5	0.5	0.5	0.5	3,150.0
		Other cost of goods sold	0.4	0.4	0.4	0.4	2,800.0
	Allocable costs	Purchase of intermediate goods	1,444.1	1,143.3	21.1	541.5	3,150.0
		Other cost of goods sold	1,283.7	1,016.2	18.7	481.4	2,800.0
		Sales & Marketing: Local	442.9	357.1	114.3	585.7	1,500.0
		Total allocable costs	3,170.7	2,516.6	154.1	1,608.6	7,450.0
	Non- allocable costs	Sales & Marketing: Global	0.0	200.0	0.0	0.0	200.0
		General and Administrative (G&A)	0.0	300.0	0.0	0.0	300.0
		Research and Development (R&D)	375.0	275.0	0.0	100.0	750.0
		Total non- allocable costs	375.0	775.0	0.0	100.0	1,250.0
	Cost of goods sold		3,102.8	2,434.5	39.8	1,122.9	6,700.0
	Sales, General and Administrative Expenses		442.9	857.1	114.3	585.7	2,000.0
	Labor costs(included in the above amount)		840.6	979.4	53.2	466.8	2,340.0
	Total costs		3,545.7	3,291.6	154.1	1,708.6	8,700.0
Operating income (consolidated)							1,800.0
Indicators	**Sales ratio by country (group-wide)**		29.5%	23.8%	7.6%	39.0%	100.0%
	Cost ratio by country (group-wide)		40.8%	37.8%	1.8%	19.6%	100.0%
	Asset ratio by country (group-wide)		45.8%	36.3%	0.7%	17.2%	100.0%
	Labor costs ratio by country (group-wide)		35.9%	41.9%	2.3%	20.0%	100.0%
	Gross profit margin (excluding internal profits)		43.3%	43.3%	43.3%	43.3%	36.2%
	Operating profit margin						17.1%
	Return on costs (Gross profit／Total Cost)						20.7%

Source: Prepared by the author

Profit Allocation

		Case4 Headquarters : Country B				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	754.0	598.8	33.4	413.9	1,800.0
	Current Corporate tax＋Pillar1	725.2	576.8	46.8	451.2	1,800.0
	DBCFT① (Allocate non- allocable costs based on gross profit)	198.1	192.9	600.5	2,383.5	3,375.0
	DBCFT② (All non- allocable costs are recorded at the location where they are incurred)	276.4	-220.0	656.5	2,662.1	3,375.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	667.8	611.7	63.4	457.1	1,800.0
	Formulary apportionment(sales-only formula)	531.4	428.6	137.1	702.9	1,800.0
	RPAI	585.1	492.2	110.1	612.6	1,800.0
	RPA(Avi-Yonah)	604.7	520.1	99.0	576.2	1,800.0
	Current Corporate tax (Cost plus Method)	677.2	540.0	75.1	507.7	1,800.0
	Current Corporate tax＋Pillar1 (Cost plus Method)	658.3	525.6	83.1	532.9	1,800.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	227.2	215.1	584.7	2,348.0	3,375.0

Source: Prepared by the author

(5) Case 5

Setting the conditions for corporate activities

			Case5 Headquarters : Country A				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		35,000.0	1,000.0	2,000.0	4,000.0	42,000.0
Manufacture	Quantity produced		329,166.7	9,404.8	18,809.5	37,619.0	395,000.0
	Intra-group transactions		159,166.7	-16,595.2	-55,190.5	-87,381.0	0.0
Sales	Quantity sold		170,000.0	26,000.0	74,000.0	125,000.0	395,000.0
	Price per unit		1.0	1.0	1.0	1.0	
	Revenues		170,000.0	26,000.0	74,000.0	125,000.0	395,000.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	0.3	0.3	0.3	0.3	118,500.0
		Other cost of goods sold	0.3	0.3	0.3	0.3	102,700.0
	Allocable costs	Purchase of intermediate goods	98,750.0	2,821.4	5,642.9	11,285.7	118,500.0
		Other cost of goods sold	85,583.3	2,445.2	4,890.5	9,781.0	102,700.0
		Sales & Marketing: Local	8,607.6	1,316.5	3,746.8	6,329.1	20,000.0
		Total allocable costs	192,940.9	6,583.1	14,280.2	27,395.8	241,200.0
	Non- allocable costs	Sales & Marketing: Global	2,000.0	0.0	0.0	0.0	2,000.0
		General and Administrative (G&A)	3,000.0	0.0	0.0	0.0	3,000.0
		Research and Development (R&D)	25,000.0	250.0	500.0	1,000.0	26,750.0
		Total non- allocable costs	30,000.0	250.0	500.0	1,000.0	31,750.0
	Cost of goods sold		184,333.3	5,266.7	10,533.3	21,066.7	221,200.0
	Sales, General and Administrative Expenses		38,607.6	1,566.5	4,246.8	7,329.1	51,750.0
	Labor costs(included in the above amount)		50,876.4	1,604.7	3,654.9	6,844.0	62,980.0
	Total costs		222,940.9	6,833.1	14,780.2	28,395.8	272,950.0
Operating income (consolidated)							122,050.0
Indicators	**Sales ratio by country (group-wide)**		43.0%	6.6%	18.7%	31.6%	100.0%
	Cost ratio by country (group-wide)		81.7%	2.5%	5.4%	10.4%	100.0%
	Asset ratio by country (group-wide)		83.3%	2.4%	4.8%	9.5%	100.0%
	Labor costs ratio by country (group-wide)		80.8%	2.5%	5.8%	10.9%	100.0%
	Gross profit margin (excluding internal profits)		44.0%	44.0%	44.0%	44.0%	44.0%
	Operating profit margin						30.9%
	Return on costs (Gross profit／Total Cost)						44.7%

Source: Prepared by the author

Profit Allocation

		Case5 Headquarters : Country A				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	96,368.2	3,529.7	7,545.7	14,606.4	122,050.0
	Current Corporate tax+Pillar1	87,859.2	4,403.9	10,519.0	19,267.9	122,050.0
	DBCFT① (Allocate non-allocable costs based on gross profit)	2,970.6	19,744.4	60,017.2	98,567.7	181,300.0
	DBCFT② (All non-allocable costs are recorded at the location where they are incurred)	-3,565.9	20,577.6	62,041.3	102,247.1	181,300.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	84,276.8	4,683.1	11,920.0	21,170.1	122,050.0
	Formulary apportionment(sales-only formula)	52,527.8	8,033.7	22,865.1	38,623.4	122,050.0
	RPAI	58,157.3	7,434.7	20,932.1	35,525.9	122,050.0
	RPA(Avi-Yonah)	60,438.0	7,198.7	20,138.5	34,274.9	122,050.0
	Current Corporate tax（Cost plus Method)	85,103.0	4,637.3	11,569.7	20,740.0	122,050.0
	Current Corporate tax+Pillar1（Cost plus Method)	78,780.5	5,296.5	13,762.1	24,211.0	122,050.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	5,488.6	19,496.9	59,117.8	97,196.8	181,300.0

Source: Prepared by the author

(6) Case 6

Setting the conditions for corporate activities

			Case6 Headquarters : Country A				
			Country A	Country B	Country C	Country D	Total
Assets	Fixed assets		85,000.0	7,000.0	1,000.0	19,000.0	112,000.0
Manufacture	Quantity produced		207,407.4	0.0	0.0	0.0	207,407.4
	Intra-group transactions		107,407.4	-22,222.2	-2,222.2	-82,963.0	0.0
Sales	Quantity sold		100,000.0	22,222.2	2,222.2	82,963.0	207,407.4
	Price per unit		1.4	1.4	1.4	1.4	
	Revenues		135,000.0	30,000.0	3,000.0	112,000.0	280,000.0
Costs	*(manufacturing cost of sold products per unit)*	*Purchase of intermediate goods*	0.2	0.2	0.2	0.2	50,000.0
		Other cost of goods sold	0.4	0.4	0.4	0.4	75,000.0
	Allocable costs	Purchase of intermediate goods	50,000.0	0.0	0.0	0.0	50,000.0
		Other cost of goods sold	75,000.0	0.0	0.0	0.0	75,000.0
		Sales & Marketing: Local	15,428.6	3,428.6	342.9	12,800.0	32,000.0
		Total allocable costs	140,428.6	3,428.6	342.9	12,800.0	157,000.0
	Non- allocable costs	Sales & Marketing: Global	3,000.0	0.0	0.0	0.0	3,000.0
		General and Administrative (G&A)	5,000.0	0.0	0.0	0.0	5,000.0
		Research and Development (R&D)	30,000.0	1,000.0	0.0	8,500.0	39,500.0
		Total non- allocable costs	38,000.0	1,000.0	0.0	8,500.0	47,500.0
	Cost of goods sold		125,000.0	0.0	0.0	0.0	125,000.0
	Sales, General and Administrative Expenses		53,428.6	4,428.6	342.9	21,300.0	79,500.0
	Labor costs(included in the above amount)		53,371.4	1,771.4	137.1	8,520.0	63,800.0
	Total costs		178,428.6	4,428.6	342.9	21,300.0	204,500.0
Operating income (consolidated)							75,500.0
Indicators	**Sales ratio by country (group-wide)**		48.2%	10.7%	1.1%	40.0%	100.0%
	Cost ratio by country (group-wide)		87.3%	2.2%	0.2%	10.4%	100.0%
	Asset ratio by country (group-wide)		75.9%	6.3%	0.9%	17.0%	100.0%
	Labor costs ratio by country (group-wide)		83.7%	2.8%	0.2%	13.4%	100.0%
	Gross profit margin (excluding internal profits)		55.4%	55.4%	55.4%	55.4%	55.4%
	Operating profit margin						27.0%
	Return on costs (Gross profit／Total Cost)						36.9%

Source: Prepared by the author

Profit Allocation

		Case6 Headquarters : Country A				
		Country A	Country B	Country C	Country D	Total
Taxable income	**Current Corporate tax**	71,031.6	924.5	92.4	3,451.4	75,500.0
	Current Corporate tax＋Pillar1	64,719.1	2,230.5	223.1	8,327.3	75,500.0
	DBCFT① (Allocate non- allocable costs based on gross profit)	-18,631.9	24,648.0	2,464.8	92,019.1	100,500.0
	DBCFT② (All non- allocable costs are recorded at the location where they are incurred)	-18,428.6	25,571.4	2,657.1	90,700.0	100,500.0
	Formulary apportionment(three equally weighted factors : sales, labor and assets)	52,286.6	4,968.1	548.4	17,696.8	75,500.0
	Formulary apportionment(sales-only formula)	36,401.8	8,089.3	808.9	30,200.0	75,500.0
	RPAI	41,588.4	6,919.6	682.0	26,310.0	75,500.0
	RPA(Avi-Yonah)	42,389.1	6,778.1	670.3	25,662.5	75,500.0
	Current Corporate tax（Cost plus Method)	52,976.7	4,660.0	466.0	17,397.3	75,500.0
	Current Corporate tax＋Pillar1（Cost plus Method)	49,955.3	5,285.1	528.5	19,731.1	75,500.0
	DBCFT① (Allocate non- allocable costs based on gross profit and Cost plus Method)	-10,654.1	22,997.4	2,299.7	85,857.0	100,500.0

Source: Prepared by the author