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Corporate Tax Increases and Shareholder-Level Capital Income Tax Neutrality in Japan -An Analysis of Fundamental Reforms Using Effective Tax Rates-

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Corporate Tax Increases and Shareholder-Level Capital Income Tax Neutrality in Japan
-An Analysis of Fundamental Reforms Using Effective Tax Rates-[*]

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Abstract

Although Japan is considering increasing the corporate income tax rate, the tax base requires reforms to maintain or lower the effective tax rate from an economic perspective. In this case, capital income tax at the shareholder and corporate levels is important. This study focuses on financing neutrality and analyzes it using forward-looking effective tax rates. The reform proposals are the Comprehensive Income Business Tax (CBIT), Allowance for Corporate Equity (ACE), and Allowance for Corporate Capital (ACC). This study reveals that the CBIT ensures financing neutrality at both the corporate and shareholder levels but raises the cost of capital, effective marginal tax rate (EMTR), and effective average tax rate (EATR). In contrast, ACE/ACC lowers the costs of capital, EMTR, and EATR. At the corporate level, the ACC is more financing neutral than the ACE, though these policies have similar financing neutrality at the shareholder level. Therefore, whether to adopt the ACE or ACC depends on the practical perspective. In this regard, many countries adopt the ACE, and there is room for consideration as tax rates in Japan increase.

JEL classification: H25 and H32

Keywords: corporate tax, shareholder-level capital income tax neutrality, fundamental tax reforms, forward-looking effective tax rates

1. Introduction

The "Fiscal 2023 Tax Reform Proposal" approved by Japan's Cabinet on December 23, 2023 describes corporate taxation as "Tax measures to secure financial resources for strengthening defense capabilities". The following is an excerpt.

> In order to drastically strengthen Japan's defense capability, stable financial resources will be secured in terms of both expenditures and revenues. The tax portion will be implemented in phases over several years toward FY2027, and a little over 1 trillion yen will be secured in FY2027. Specifically, the following measures will be taken with respect to corporate tax, income tax, and cigarette tax.
> (1) Income Taxes
> A new additional tax at a rate of 4-4.5% will be imposed on the corporate tax amount. For small and medium-sized firms, 5 million yen shall be deducted from the corporate tax amount as the tax base. (Omitted below.)

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Therefore, an additional tax rate of 4-4.5% on corporate income tax is expected. On June 16, 2023, the House of Councillors passed the "Law for Securing Financial Resources for Defense" during a plenary session. On the same day, the Cabinet approved the "Basic Policies for Economic and Fiscal Management and Reform," which stated that the timing of the tax increase would be "flexibly determined based on the status of efforts so that it can be set at an appropriate time after 2025," thus pushing back the tax increase from the Tax Reform Proposal.

Japan's corporate tax rates have decreased over the past 30 years. The basic tax rates for large firms were 43.3% in 1984, 37.5% in 1990, 30% in 1999, and 25.5% in 2012.[1] The basic tax rate is currently at 23.2%. One can recall that a special reconstruction corporation tax was imposed for three years, starting in 2012, to secure funds for reconstruction after the Great East Japan Earthquake.[2] Nevertheless, this tax increase was temporary and did not change the major global trend of tax rate reduction. However, as the increase in the defense budget would likely be permanent, a tax rate increase in the future would be a major turning point in corporate tax reform.

Japan's corporate tax reforms used the Ministry of Finance's effective tax rate as a policy target.[3] However, the Ministry of Finance's effective tax rate is merely a combination of the statutory tax rates. Effective tax rates have a greater impact on firms' and households' investment behaviors. Despite an increase in the statutory tax rate increases, the effective tax rate may be the same depending on the tax base device. Therefore, even with a future increase in Japan's corporate tax rate, reforms to the tax base are necessary to maintain or lower the effective tax rate.

OECD.Stat reports forward-looking effective tax rates for Organization for Economic Co-operation and Development (OECD) countries.[4] The OECD emphasizes forward-looking effective tax rates rather than backward-looking effective tax rates because forward-looking ones are more important in investment decision making. As measurements of backward-looking effective tax rates use historical tax revenue and corporate data, the effective rate is eventually going to include economic fluctuations, corporate tax planning, and other factors. Therefore, I also use forward-looking effective tax rates in the analysis. Forward-looking effective tax rates include the Effective Average Tax Rate (EATR) and Effective Marginal Tax Rate (EMTR). According to Devereux and Griffith (2003), EATR affects the choice of investment country and assets to invested in, whereas EMTR affects the level of investment.

Thus, this study focuses on effective tax rates at the shareholder-level. King (1974), Auerbach (1979), and Bradford (1981) show that corporate investment decisions depend not only on corporate income taxes but also on taxes on interest payments, dividends, and capital gains at the shareholder level.

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[1] The reduced tax rate for small and medium-sized corporations with less than ¥8 million per year was 31% in 1984, 28% in 1990, 22% in 1999, and 19% since 2012. After 2009, a special reduced tax rate for small and medium-sized corporations was established, which is currently 15%.

[2] The tax was an additional 10% of the corporate tax amount. The Special Reconstruction Corporation Tax was originally scheduled for implementation through 2015, but was repealed one year ahead of schedule.

[3] For example, in the "Revised Strategy for the Revitalization of Japan 2014" and "Basic Policies for Economic and Fiscal Management and Reform" documents, the stated policy goal was to reduce the combined national and local effective corporate tax rate to the 20% level.

[4] See OECD.Stat (https://stats.oecd.org/), "Effective Tax Rates."

King and Fullerton (1984) present the concept of effective tax rates at the shareholder and corporate levels.

In Japan, the government's recent "Asset Income Doubling Plan" is part of a policy to redirect large amounts of household financial assets to investment funds under the slogan of "from savings to investment." Against this background, one must consider the impact of corporate tax reform on effective tax rates at both the corporate and shareholder levels. At the shareholder level, the corporate income tax should be viewed as a form of capital income tax.

This study examines the impact of upcoming corporate tax rate increases on effective tax rates at the shareholder- and corporate levels. To investigate the possibility of maintaining or reducing effective tax rates, I consider the cases of both a simple tax rate increase and fundamental reforms of capital income tax.[5] In fact, reforms to Japan's corporate income tax system not only includes a simple reduction in the tax rate but also includes an expansion of the tax base. Raising tax rates, such as by establishing an additional tax, simply raises effective tax rates; however, when accompanied by a change in the tax base, the effect on effective tax rates is not simple.

Therefore, I study the fundamental reforms of capital income tax aimed at financing neutrality, which other countries implemented in recent years, at both the shareholder and corporate levels, together with an increase in the tax rate. If financing neutrality improves, then the marginal effective tax rate can be lowered, even if the tax rate increases. Specific radical reforms include the Comprehensive Income Business Tax (CBIT), Allowance for Corporate Equity (ACE), and Allowance for Corporate Capital (ACC).[6] Many countries have introduced an ACE, and there is room for further consideration in Japan.[7]

Furthermore, this study focuses on the tax reforms that should be implemented as fundamental reforms of the capital income tax system, which aim to raise corporate tax rates and neutralize financing by measuring effective tax rates at the corporate and shareholder levels using a forward-looking effective tax rate model.

The rest of this paper is organized as follows. Section 2 summarizes the concepts of the average and marginal effective tax rates. Section 3 presents the forward-looking effective tax rate model. Section 4 sets the parameters, while Section 5 presents the simulation results. Finally, section 6 concludes the study.

2. Average and Marginal Effective Tax Rates

In this section, I organize the concepts of average and marginal effective tax rates, referring to Creedy and Gemmell (2017) and present a conceptual diagram of both types in Figure 1. The vertical axis in Figure 1 shows the marginal rate of return, and the horizontal axis shows capital stock.

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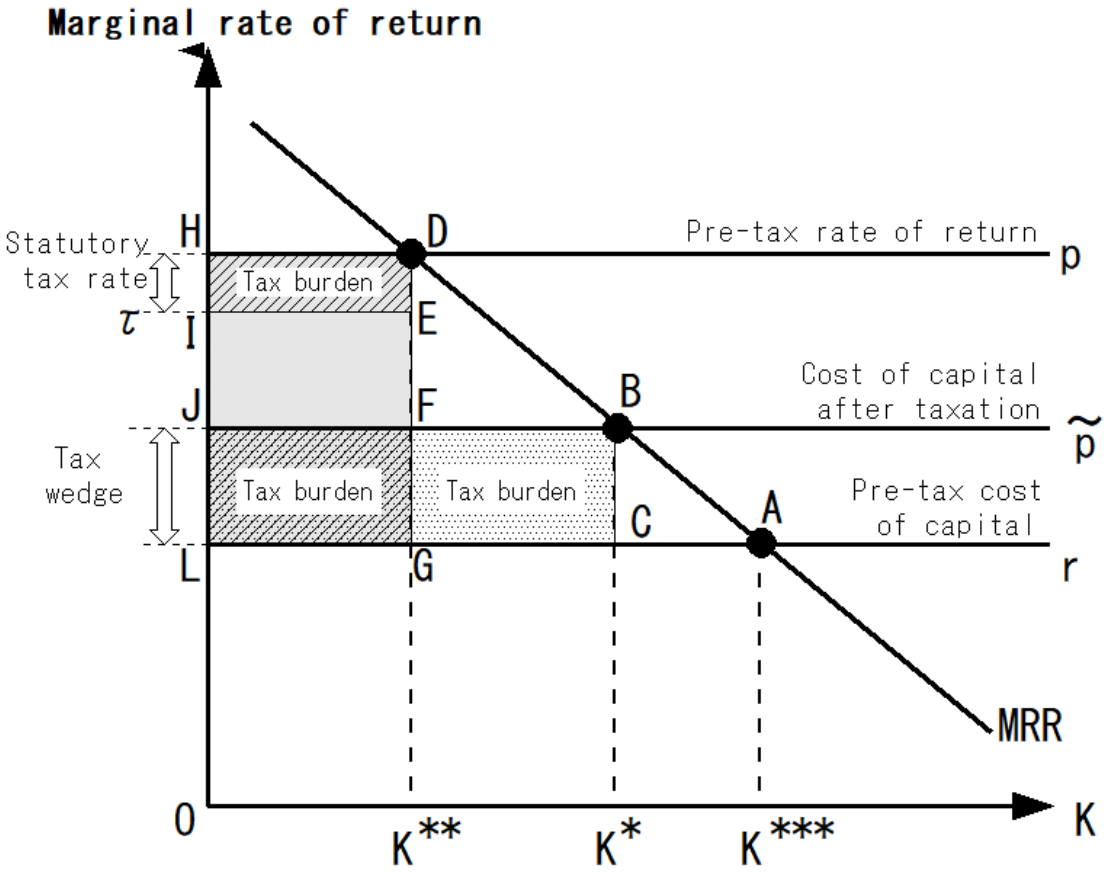
[5] Uemura (2023) analyzes corporate income taxes at the corporate level in terms of financing neutrality.

[6] See U.S. Department of the Treasury (1992) for CBIT, Institute of Fiscal Studies (1991), and Devereux and Freeman (1991) for ACE, and Broadway and Bruce (1984) for ACC.

[7] For example, Italy, Portugal, Malta, Brazil, Belgium, Poland, Turkey, Liechtenstein, and Cyprus; see Hebous and Klemm (2018) and Yamada (2020, 2021).

Figure 1 Concepts of Average and Marginal Effective Tax Rates



Let MRR be the Marginal Rate of Return from one unit of investment in capital stock by one investment project of a certain firm and r be the rate of return demanded by the firm's shareholders. The optimal pre-tax capital stock K^{***} is determined by point A, where MRR, which is a rightward curve, intersects the pre-tax cost of capital r. I assume a perfectly competitive market with no uncertainty, zero adjustment costs to capital stock, zero transaction costs in the capital market, a closed economic system with no international capital movements, constant tax rates, interest rates, inflation rates, and economic capital depletion rates over time.

Now, the pre-tax rate of return of firm p is higher than the post-tax cost of capital $\tilde{p}$— a rate of return that includes excess profit above the cost of capital after taxation ($p > \tilde{p}$). At point D, the intersection with the MRR, the capital stock K^{**} is higher than the after-tax cost of capital. Although this level of capital stock is not optimal, the effective tax rate at this point is the $EATR$. Devereux and Griffith (2003) define this as

$$EATR = \frac{(\tilde{p}-r)+(p-\tilde{p})\tau}{p}. \quad (1)$$

In addition, statutory tax rate τ and $(\tilde{p}-r)$ are called tax wedges. Figure 1 shows that the $EATR$ is equal to (JFGL + HDEI) / HDK**O. The EATR consists of taxation JFGL on normal profits, JFK**O, and taxation HDEI on excess profits, HDFJ.

Because the pre-tax rate of return includes excess profits, when investment is carried out until capital stock reaches its optimal level, the rate of return declines to the $\tilde{p}$, where excess profits decline to zero and only normal profits, JBK*O, are available. The optimal capital stock K^* is at point B, which is the intersection of the MRR. The effective tax rate at this point is the $EMTR$, defined by King and Fullerton (1984) as

$$EMTR = \frac{\tilde{p}-r}{\tilde{p}}. \tag{2}$$

According to Figure 1, the $EMTR$ is a tax on normal profits and corresponds to JBCL / JBK*O. The relationship between the $EATR$ and $EMTR$ can be summarized as follows:

$$EATR = EMTR\frac{\tilde{p}}{p} + \left(1 - \frac{\tilde{p}}{p}\right)\tau. \tag{3}$$

In other words, the average effective tax rate is the weighted average of the marginal effective tax rate and statutory tax rate τ by the cost of capital $\tilde{p}$, as demonstrated by Devereux and Griffith (2003).

This relationship illustrates that when the statutory tax rate increases because of a rate increase, the average effective tax rate increases, but the marginal effective tax rate does not necessarily increase. For example, if an increase in the statutory tax rate increases tax savings from depreciation, then the marginal effective tax rate may decrease. In addition, if financing neutrality is ensured as targeted by various fundamental reforms, the average and marginal effective tax rates decline. Thus, if the tax rate increases and fundamental reforms are implemented simultaneously, movement in effective tax rates cannot be determined.

In addition, one can distinguish between effective tax rates at the corporate and shareholder levels. Corporate-level effective tax rates include corporate taxation, local corporate taxation, corporate inhabitant tax, corporate enterprise tax, special corporate enterprise tax, and property tax, while shareholder-level effective tax rates include interest income tax, dividend income tax, and capital gains tax as shareholder-level taxes.

In the subsequent sections, I present a theoretical model of forward-looking effective tax rates and conduct a simulation analysis with parameters set for Japan to analyze how the corporate tax rate increases and fundamental reforms affect effective tax rates at the corporate and shareholder levels.

3. Theoretical Model: Forward-Looking Effective Tax Rates for Capital Income Tax

Following Hanappi (2018), OECD (2020), and Spengel et al. (2020), I formulate forward-looking effective tax rates for capital income tax. I begin with the capital market arbitrage conditions that investors face, as King (1974) indicates:

$$\left\{1 + \left(1 - m^i\right)i\right\}V_t = (1 - m^d)D_t - N_t + V_{t+1} - z(V_{t+1} - N_t - V_t), \tag{4}$$

where t is time, m^i is the interest income tax rate, i is the nominal interest rate, V is firm value, m^d is the dividend income tax rate, D is dividends, N is new share issuances, and z is the effective tax rate on capital gains. From this perspective, I obtain

$$V_t = \frac{\{\gamma D_t - N_t + V_{t+1}\}}{1+\rho}, \qquad \rho = \frac{(1-m^i)i}{1-z}, \qquad \gamma = \frac{1-m^d}{1-z}, \tag{5}$$

where the shareholders' nominal discount rate (ρ) and the composite tax rate (γ) represent the tax

treatments of dividends and capital gains, respectively. This composite tax rate is a combination of tax rates at the shareholder level and plays an important role in the effective tax rate at this level. Following King and Fullerton (1984), z is the statutory tax rate on capital gains z^*, and the ratio of realized gains to unrealized gains $\lambda \in [0,1]$ is assumed to be constant.

$$z = \lambda z^* \sum_{j=0}^{\infty} \left(\frac{1-\lambda}{1+\rho}\right)^j = \frac{\lambda z^*}{\lambda+\rho} \tag{6}$$

Using the accounting identity formula for the firm, I can state D as

$$D_t = Q(K_{t-1})(1-\tau) - I_t + B_t - \{1 + i(1-\theta\tau)\}B_{t-1} + \tau\varphi(K_{t-1}^T) - \tau_e(1-\tau)K_{t-1}^T + N_t, \tag{7}$$

which includes the production function $Q(K)$, capital stock K, statutory corporate income tax rate τ, investment I, debt B, interest expense deductible rate $\theta \in [0,1]$, statutory rate of depreciation φ, statutory property tax rate τ_e, and the accounting book value of assets K^T. I standardize the prices of the firm's output and investment goods at the end of period t at 1, and the prices increase annually by the inflation rate π. Capital stock K and accounting book value of assets K^T are stated as follows:

$$K_t = (1-\delta)K_{t-1} + I_t \tag{8}$$

$$K_t^T = (1-\varphi)K_{t-1}^T + I_t, \tag{9}$$

where the economic capital depletion rate is δ. Here, the economic rent R is

$$R = (1+\rho)dV_t = \sum_{s=0}^{\infty}\left\{\frac{\gamma dD_{t+s} - dN_{t+s}}{(1+\rho)^s}\right\}. \tag{10}$$

I obtain the economic rent R^{RE} when the firm invests with retained earnings ($dB = dN = 0$):

$$R^{RE} = \sum_{s=0}^{\infty} \frac{\gamma dD_{t+s}}{(1+\rho)^s}$$

$$= \gamma\left\{\sum_{s=0}^{\infty}\frac{dQ(K_{t-1+s})(1-\tau)}{(1+\rho)^s} - \sum_{s=0}^{\infty}\frac{dI_{t+s}}{(1+\rho)^s} + \tau\varphi\sum_{s=0}^{\infty}\frac{dK_{t-1+s}^T}{(1+\rho)^s} - \tau_e(1-\tau)\sum_{s=0}^{\infty}\frac{dK_{t-1+s}^T}{(1+\rho)^s}\right\}. \tag{11}$$

Similar to the assumptions of Devereux and Griffith (2003), when a firm uses its retained earnings to invest 1 unit in period 0 and sells its capital stock in period 1 (one-period perturbation), R^{RE} is

$$R^{RE} = -\gamma\{1 - A + \tau_e(1-\tau)\} - v\tau\pi + \frac{\gamma}{1+\rho}\{(p+\delta)(1+\pi)(1-\tau) + (1-\delta)(1+\pi)(1-A)\}. \tag{12}$$

The first term on the right-hand side is the effect of 1 unit of investment in period 0, which reduces dividends to shareholders. The second term on the right-hand side is the effect of changes in asset values due to inflation on taxation. The third term on the right-hand side is the after-tax dividends to shareholders in period 1 and the gain on the sale of assets. $v = \{0, 0.5, 1\}$ is the asset valuation method, where $v = 0$ is the LIFO (Last In First Out) method, $v = 1$ is FIFO (First In First Out), and $v = 0.5$ is treated as a mixture of the two. When p is the pre-tax rate of return, the marginal productivity of capital is $Q(K_{t+1}) = (p+\delta)(1+\pi)$ and A is the discounted present value of the tax savings from the depreciation system.

The discounted present value of tax savings from depreciation system A consists of the statutory corporate income tax rate τ and the discounted present value of depreciation allowance PDV.

$$A = \tau \cdot PDV \tag{13}$$

The Japanese depreciation system uses the straight-line method (SL) for buildings and intangibles and the declining-balance method with a switch to straight-line (DBSL) for machinery. The DBSL depreciation method initially uses the declining-balance method but switches to the straight-line method midway through the depreciation period. The discounted present value of each depreciation PDV is

$$PDV = PDV_{SL} = \varphi\left\{1 + \left(\frac{1}{1+\rho}\right) + \left(\frac{1}{1+\rho}\right)^2 + \cdots + \left(\frac{1}{1+\rho}\right)^{L-1}\right\} = \frac{\varphi(1+\rho)}{\rho}\left\{1 - \left(\frac{1}{1+\rho}\right)^{1/\varphi}\right\} \tag{14}$$

$$PDV = PDV_{DBSL}$$

$$= \frac{\varepsilon}{1+\rho}\left\{1 + \left(\frac{1-\varepsilon}{1+\rho}\right) + \left(\frac{1-\varepsilon}{1+\rho}\right)^2 + \cdots + \left(\frac{1-\varepsilon}{1+\rho}\right)^{L^*-1}\right\} + \frac{(1-\varepsilon)^{L^*}}{L-L^*}\left\{\left(\frac{1}{1+\rho}\right)^{L^*+1} + \cdots + \left(\frac{1}{1+\rho}\right)^{L}\right\} \tag{15}$$

Here, the statutory useful life L, period L^* $(0 \le L^* \le L)$ during which the declining-balance method is applied, and the statutory depreciation rate $\varphi = 1/L^*$ for the period of the declining-balance method. With an additional parameter a that accelerates depreciation, $\varepsilon = a\varphi$. Under the 200% declining-balance method in Japan, $a = 2$.

Next, I consider the case in which the firm invests in 1 unit by issuing new shares and raising external funds such as debt. In the case of a new stock issue, $dB = 0$ and $dN = 1$ and in the case of debt financing, $dB = 1$ and $dN = 0$; then, the external cost of external financing F is

$$F = \gamma \mathrm{d}B_t\left\{1 - \frac{1+i(1-\theta\tau)}{1+\rho}\right\} - (1-\gamma)dN_t\left(1 - \frac{1}{1+\rho}\right). \tag{16}$$

The economic rent R with added external costs F is

$$R = R^{RE} + F, \qquad F = \begin{cases} F^{RE} = 0 \\ F^{NE} = -\frac{\rho}{1+\rho}\{1 + \tau_e(1-\tau)\}(1-\gamma) \\ F^{DE} = \frac{\gamma}{1+\rho}\{1 + \tau_e(1-\tau)\}\{\rho - i(1-\theta\tau)\} \end{cases}, \tag{17}$$

where is the external cost of retained earnings F^{RE} is the external cost of new share issuance F^{NE}, and is the external cost of debt F^{DE}.

Now that I have the economic rent with taxation R, I can now formulate the economic rent R^* in the no-taxation case ($\tau = z = m^i = m^d = \tau_e = 0$):

$$R^* = \frac{p-r}{1+r}. \tag{18}$$

Here, I use $(1+i) = (1+r)(1+\pi)$. With this set up, I obtain the $EATR$:

$$EATR = \frac{R^* - (1-z)R}{p/(1+r)}. \tag{19}$$

The economic rent R is zero; that is, the pre-tax rate of return when the investment reaches the optimal capital stock, and the cost of capital $\tilde{p}$ is

$$\tilde{p} = \frac{(1-A)\{\rho + \delta(1+\pi) - \pi\} + \nu\tau\pi + (1+\rho)(1-\tau)\tau_e}{(1+\pi)(1-\tau)} - \frac{F(1+\rho)}{\gamma(1+\pi)(1-\tau)} - \delta. \tag{20}$$

Using these settings, I can restate the $EMTR$ as

$$EMTR = \frac{\tilde{p}-r}{\tilde{p}}. \quad (21)$$

I calculate the $\tilde{p}$, $EATR$, and $EMTR$ using assets and financing. Spengel et al. (2020) measure the composite cost of capital $\bar{\tilde{p}}$, composite average effective tax rate ($\overline{EATR}$) and the composite marginal effective tax rate ($\overline{EMTR}$) using the asset and financing share parameters of a representative firm:

$$\bar{\tilde{p}} = \sum \alpha_k \beta_f \widetilde{p_{k,f}}, \qquad \overline{EATR} = \sum \alpha_k \beta_f EATR_{k,f}, \qquad \overline{EMTR} = \frac{\bar{\tilde{p}}-r}{\bar{\tilde{p}}}, \quad (22)$$

where α_k is the asset share, β_f is the funding share, the subscript k represents assets, and the subscript f indicates financing for a representative firm. The sum of the asset and financing shares are 1.

$$\sum \alpha_k = \sum \beta_f = 1 \quad (23)$$

Spengel et al. (2020) consider five assets: industrial buildings ($k = 1$), intangibles ($k = 2$), machinery ($k = 3$), financial assets ($k = 4$), inventory ($k = 5$), and three types of financing: retained earnings ($f = 1$), new stock issuance ($f = 2$), and debt ($f = 3$).

4. Financing Neutrality through Parameter Setting and Fundamental Reforms

I perform a simulation analysis by assigning appropriate parameters to the theoretical model of forward-looking effective tax rates presented in the previous section. Table 1 lists the assumptions and parameters for each case. I set the at the (i) corporate level (large firms), (ii) shareholder level (large firms), (iii) shareholder level (SMEs: basic rate), and (iv) shareholder level SMEs (reduced rate).

I distinguish between large firms with capital of over 100 million yen and small- and medium-sized firms with capital of less than 100 million yen. Small and medium-sized firms (SMEs) are assumed to have an annual income of more than 4 million yen and less than 8 million yen and are subject to the reduced national corporate income tax rate and reduced corporate enterprise tax rate.[8] Since 2009, the national government has implemented a special transitional measure for the reduced corporate income tax rate; therefore, I also consider such cases.

In principle, the parameters are based on the 2020 Japanese case of Spengel et al.'s (2020) international comparative study.[9] The economic depreciation rate, real interest rate, inflation rate, pre-tax rate of return, useful life of depreciable assets, property tax rate, valuation method for financial assets and inventory, personal income tax rate at the shareholder level, and asset and financing share parameters are the same as those for Japan in Spengel et al. (2020). Note that for (i) corporate level (large) firms, personal income tax rates are set to 0 because they are unnecessary.

[8] The national corporate tax rate is a basic rate for large firms and a reduced rate for small and medium-sized firms with income of ¥8 million or less per year. Special exceptions are set for the reduced tax rates. The corporate enterprise tax rate on income is 3.5% for income of 4 million yen or less annually, 5.3% for income exceeding 4 million yen and 8 million yen annually, and 7.0% for income exceeding 8 million yen annually.

[9] Note that for the Japanese case in Spengel et al. (2020), their calculation results are reproduced by giving parameters to the model.

Table 1 Assumptions and Parameters for Each Case

		(i) Corporate level (Large firm)	(ii) Shareholder level (Large firm)	(iii) Shareholder level (SMEs: Basic rate)	(iv) Shareholder level (SMEs: Reduced rate)
Capital stock		Over 100 million yen		Less than 100 million yen	
Assumed income amount		Over 8 million yen per year		Over 4 million yen per year Less than 8 million yen per year	
Economic depreciation rate					
Industrial buildings ($k = 1$)	δ_1	3.1%			
Intangibles ($k = 2$)	δ_2	15.35%			
Machinery ($k = 3$)	δ_3	17.5%			
Real rate of interest	r	5%			
Inflation rate	π	2 %			
Pre-tax rate of return	p	20%			
National corporate income tax rate	τ_C	23.2%		19.0%	15.0%
Local corporate tax rate	τ_L	10.3%			
Corporate inhabitant tax rate	τ_R	7.0% (= 1.0% prefectural tax + 6.0% municipal inhabitant tax)			
Corporate enterprise tax rate per income	τ_B	1.0%		5.3%	
Special corporate enterprise tax rate	τ_S	260.0%		37.0%	
Rate of corporate enterprise tax on value-added	τ_V	1.2%		0.0%	
New Additional Tax Rates	τ_N	Before tax increase: 0.0% At the time of the tax increase: 4.0% (assuming an income of over ¥5 million per year for SMEs)			
Statutory depreciation rate					
Industrial buildings ($k = 1$)	φ_1	2.7% ($L = 38$) SL			
Intangibles ($k = 2$)	φ_2	12.5% ($L = 8$) SL			
Machinery ($k = 3$)	φ_3	20% ($L = 10$) DBSL ($a = 2,\ L^* = 5$)			
Percentage of interest expense deductible for tax purposes	θ	96.34%		100.00%	
Statutory property tax rate	τ_e	1.4%			
Financial assets ($k = 4$) Valuation method	v_4	1.0			
Inventory ($k = 5$) Valuation method	v_5	0.5			
Personal income tax					
Interest income tax rate	m^i	0.0%	20.64%		
Dividend income tax rate	m^d	0.0%	49.55%		
Capital gains tax rate	z^*	0.0%	20.64%		
Percentage of realized profit	λ	0.0%	10.0%		
Asset Share Parameters					
Industrial buildings ($k = 1$)	α_1	20%			
Intangibles ($k = 2$)	α_2	20%			
Machinery ($k = 3$)	α_3	20%			
Financial assets ($k = 4$)	α_4	20%			
Inventory ($k = 5$)	α_5	20%			
Financing Share Parameters					
Retained earnings ($f = 1$)	β_1	55%			
Issuance of new shares ($f = 2$)	β_2	10%			
Liabilities ($f = 3$)	β_3	35%			

Some parameters are provided by Spengel et al. (2020) for the Japanese case and modified to

fit the Japanese system. The period to which the declining-balance method is applied for machinery L^* is set according to the "Ministerial Ordinance Concerning the Useful Life of Depreciable Assets, etc." Spengel et al. (2020) also account for the city planning tax, which I omit because it is imposed only in specific areas. I establish the deductibility ratio of interest expenses considering that the value-added portion of corporate enterprise tax is not deductible. Note that the value-added discount rate does not apply to SMEs.

The statutory tax rate (τ) in the theoretical model discussed in the previous section is given below using a formula based on the Ministry of Finance-type effective tax rate.

$$\tau = \frac{\tau_C(1+\tau_L+\tau_R+\tau_N)+\tau_B(1+\tau_S)+\tau_V}{1+\tau_B(1+\tau_S)+\tau_V} \tag{24}$$

Here, τ_C is the national corporate tax rate, τ_L is the local corporation tax rate, τ_R is the corporate inhabitant tax rate, τ_B is the tax rate of corporate enterprise tax per income, τ_S is the special corporate enterprise tax rate, and τ_V is rate of enterprise tax on value-added. The denominator includes the corporate enterprise tax rate because it is a deductible expense. The tax base of the special enterprise tax is the enterprise tax on income, and I use the standard tax rate for local taxes.

Note that I include the new additional tax rate τ_N. According to the "Outline of Tax Reform for FY2023," the assumed additional tax rate is 4.0-4.5%; hence, I assume a tax rate of 4.0% when the tax rate increases. According to the "Outline," SMEs are not subject to tax on income up to 5 million yen per year; therefore, I assume that the SMEs analyzed in this study have income in excess of 5 million yen per year.

This study focuses on the fundamental reforms of capital income tax as well as the increase in the corporate income tax rate. An analysis of the former requires modifications to the theoretical models related to the retained earnings, new share issuances, debt financing, and personal income tax parameters at the shareholder level.

First, I modify the model to analyze the CBIT. Assuming the simplest CBIT method, the deductibility ratio of the interest expenses is set to zero ($\theta = 0$). Therefore, the external cost of the CBIT F_{CBIT} is set as follows: The external costs of retained earnings and new share issuances need not be adjusted.

$$F = \begin{cases} F_{CBIT}^{RE} = 0 \\ F_{CBIT}^{NE} = -\frac{\rho}{1+\rho}\{1+\tau_e(1-\tau)\}(1-\gamma) \\ F_{CBIT}^{DE} = \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}\{\rho - i\} \end{cases} \tag{25}$$

Personal income taxes at the shareholder level are eliminated in the simplest CBIT considered here ($m^i = m^d = z = 0$). Therefore, the composite tax rate $\gamma = (1-m^d)/(1-z) = 1$ and discount rate $\rho = (1-m^i)i/(1-z) = i$ are the same as the composite tax and discount rates. In this case, $F_{CBIT}^{RE} = F_{CBIT}^{NE} = F_{CBIT}^{DE} = 0$. Thus, the CBIT can ensure financing neutrality at both the corporate and shareholder levels ($F_{CBIT}^{RE} = F_{CBIT}^{NE} = F_{CBIT}^{DE} = 0$).

Second, I modify the model using ACE, which establishes additional costs in retained earnings and new share issuances through deemed interest. Assuming a deemed profit rate i^{ord}, tax rate τ^{res} applying ACE, and tax rate τ^{ord} not applying ACE, the external cost of ACE, F_{ACE}, is set as follows, where in ACE, the external financing of debt requires no changes.

$$F = \begin{cases} F_{ACE}^{RE} = F^{RE} + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} \\ F_{ACE}^{NE} = F^{NE} + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} \\ F_{ACE}^{DE} = \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}\{\rho - i(1-\theta\tau)\} \end{cases} \quad (26)$$

I assume the simplest ACE. That is, i^{ord} is equal to the nominal interest rate ($i^{ord} = i$), τ^{res} is equal to the statutory corporate income tax rate ($\tau^{res} = \tau$), and τ^{ord} is equal to 0% ($\tau^{ord} = 0$). In this case, retained earnings and new share issuances would allow for additional costs due to deemed interest. Note that personal income taxes at the shareholder level remain in place in the ACE. In this case, the ACE's retained earnings and the additional cost of issuing new shares to the F_{ACE} are

$$F_{ACE}^{RE} = 0 + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} \quad (27)$$

$$\begin{aligned} F_{ACE}^{NE} &= -\frac{\rho}{1+\rho}\{1+\tau_e(1-\tau)\}(1-\gamma) + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} \\ &= \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} - \frac{\gamma}{1+\rho}\rho(1-\gamma). \end{aligned} \quad (28)$$

The difference between these two equations is the second term on the right side of F_{ACE}^{NE}, which represents the additional cost of issuing new shares. At the corporate level, where personal income taxes are ignored, the second term on the right-hand side is 0 because the composite tax rate $\gamma = 1$, and the two coincide ($F_{ACE}^{RE} = F_{ACE}^{NE}$). In other words, at the corporate level, the ACE ensures financing neutrality by equalizing the additional costs of retained earnings and new share issuance. However, it is not neutral with the additional cost of debt financing F_{ACE}^{DE}, even at the corporate level and nor at the shareholder level ($F_{ACE}^{RE} = F_{ACE}^{NE} \neq F_{ACE}^{DE}$) either.

Third, I modify the model using the ACC, which, in addition to the ACE, sets additional debt financing costs through a deemed interest rate. Equation (29) defines the ACC's external financing F_{ACC}, and the external financing for retained earnings and new share issuances is the same as in the ACE.

$$F = \begin{cases} F_{ACC}^{RE} = F_{ACE}^{RE} \\ F_{ACC}^{NE} = F_{ACE}^{NE} \\ F_{ACC}^{DE} = F^{DE} + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}\{(\tau^{res}-\tau^{ord})i^{ord} - \theta i\tau\} \end{cases} \quad (29)$$

Since I assume the simplest ACC, the deemed profit rate i^{ord}, the tax rate to which ACC is applied τ^{res} and the tax rate without ACC τ^{ord}, are assumed to be the same as in the ACE case ($i^{ord} = i$, $\tau^{res} = \tau$ and $\tau^{ord} = 0$). In this case, in addition to retained earnings and new share issuances, the additional cost of deemed interest is allowed in debt financing. Furthermore, as in the case of the ACE, personal income taxes at the shareholder level remain in place.

The additional cost of the ACC's debt financing F_{ACC}^{DE} is

$$\begin{aligned} F_{ACC}^{DE} &= \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}\{\rho - i(1-\theta\tau)\} + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}\{(\tau^{res}-\tau^{ord})i^{ord} - \theta i\tau\} \\ &= \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}[\rho - i + (\tau^{res}-\tau^{ord})i^{ord}] \\ &= \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\tau^{res}-\tau^{ord})i^{ord} + \frac{\gamma}{1+\rho}\{1+\tau_e(1-\tau)\}(\rho - i). \end{aligned} \quad (30)$$

Table 2: Model Modifications and Financing Neutrality through Fundamental Reforms

	CBIT	ACE	ACC
Additional cost of retained earnings F^{RE}	No modification required	Revision required Establishment of deemed interest	Revision required Establishment of deemed interest
Additional costs of issuing new shares F^{NE}	No modification required	Revision required Establishment of deemed interest	Revision required Establishment of deemed interest
Additional cost of debt F^{DE}	Revision required Abolition of deductibility of interest expenses $\theta = 0$	No modification required	Revision required Establishment of deemed interest
Personal income tax	Revision required Abolition of personal income taxes $m^i = m^d = z^* = 0$	No modification required	No modification required
Corporate level Financing Neutrality	Yes $F^{RE}_{CBIT} = F^{NE}_{CBIT} = F^{DE}_{CBIT} = 0$	Weak $F^{RE}_{ACE} = F^{NE}_{ACE} \neq F^{DE}_{ACE}$	Yes $F^{RE}_{ACC} = F^{NE}_{ACC} = F^{DE}_{ACC}$
Shareholder level Financing Neutrality	Yes $F^{RE}_{CBIT} = F^{NE}_{CBIT} = F^{DE}_{CBIT} = 0$	No	No

Thus, the difference from the additional cost of the ACE is the second term on the right-hand side. At the corporate level, which excludes personal income taxes, the discount rate equals the nominal interest rate ($\rho = i$), the second term on the right-hand side is 0, and retained earnings, new stock issuance, and external financing of debt are all equal ($F_{ACC}^{RE} = F_{ACC}^{NE} = F_{ACC}^{DE}$). In other words, at the corporate level, the additional cost of all financing is equal in the ACC, which ensures neutral financing However, neutrality is not ensured at the shareholder level.

Table 2 summarizes the model modifications and financing neutrality.

5. Simulation Analysis of a Corporate Tax Increase and Fundamental Reforms

In the simulation analysis, I consider five cases: "Current Tax System," "Simple Tax Increase," "CBIT," "ACE," and "ACC." The "Current Tax System" case assumes a tax increase before the additional tax rate increases and is used as a comparison. The four other cases assume an additional tax increase of 4.0%.

Table 3 presents the simulation analysis of the additional tax rate increase. Compared with the current tax system, a simple tax increase raises the cost of capital, as well as the EMTR and EATR. Introducing the CBIT raises the cost of capital more than a simple tax increase as it eliminates the deductibility of interest expenses, while introducing the ACE and ACC instead of the CBIT considerably lowers the cost of capital and lowers the EMTR and EATR. In particular, the EMTR at the corporate level (i) is negative.[10]

Second, Table 4 presents the simulation results for the cost of capital, EMTR, and EATR through financing under a tax increase at a constant additional tax rate. In the case of a simple tax increase, retained earnings and new share issuances raise the cost of capital, EMTR, and EATR relative to the current tax system, while debt financing lowers them. The cost of capital with debt financing decreases because interest expenses would be deductible.

The CBIT's cost of capital, EMTR, and EATR are equal for all its retained earnings, new share issuance, and debt financing, ensuring neutral financing. The results confirm this finding at both the corporate (i) and shareholder levels (ii), (iii), and (iv) because the CBIT eliminates personal income taxes at the shareholder-level.

The ACE ensures the neutrality of all fundraising between retained earnings and new share issuance at the corporate level (i) and the neutrality of all fundraising between retained earnings and new share issuance at the corporate level (i). Furthermore, the ACC can ensure financing neutrality at the corporate level (i). However, the ACE and ACC cannot ensure financing neutrality in new share issuances at the shareholder level (ii)(iii)(iv) because the ACE and ACC do not eliminate personal income taxes.

[10] The EMTR is negative because the rate of depreciation in this system is faster than the economic capital depletion rate.

Table 3: Simulation Results at Constant Additional Tax Rates (1) (%)

		Statutory tax rate τ	Additional tax rate τ_N	Composite cost of capital	Composite EMTR	Composite EATR
(i) Corporate level (Large firm)	Current tax system	30.55	0.00	6.91	27.68	29.56
	Simple tax increase	31.43 (Constant)	4.00 (Constant)	6.97(↑)	28.26	30.33
	CBIT			8.05(↑)	37.88	34.03
	ACE			4.89(↓)	-2.30	23.19
	ACC			4.85(↓)	-3.19	23.04
(ii) Shareholder level (Large firm)	Current tax system	30.55	0.00	7.64	53.35	55.20
	Simple tax increase	31.43 (Constant)	4.00 (Constant)	7.70(↑)	53.75	55.55
	CBIT			8.05(↑)	37.88	34.03
	ACE			5.62(↓)	36.61	52.26
	ACC			5.58(↓)	36.14	52.20
(iii) Shareholder level (SMEs: Basic rate)	Current tax system	27.55	0.00	7.39	51.81	53.94
	Simple tax increase	28.26 (Constant)	4.00 (Constant)	7.44(↑)	52.11	54.22
	CBIT			7.70(↑)	35.08	30.88
	ACE			5.65(↓)	36.95	51.26
	ACC			5.65(↓)	36.95	51.26
(iv) Shareholder level (SMEs: Reduced rate)	Current tax system	23.17	0.00	7.12	49.99	52.19
	Simple tax increase	23.73 (Constant)	4.00 (Constant)	7.16(↑)	50.21	52.41
	CBIT			7.26(↑)	31.11	26.41
	ACE			5.74(↓)	37.96	49.92
	ACC			5.74(↓)	37.96	49.92

Note: Arrows next to the right side of the cost of capital indicate an increase or decrease in the cost of capital compared with the current tax system.

Table 4: Simulation Results at Constant Additional Tax Rates (2) (%)

		Composite cost of capital			Composite EMTR			Composite EATR		
		Retained earnings	Issuing new shares	Debt	Retained earnings	Issuing new shares	Debt	Retained earnings	Issuing new shares	Debt
(i) Corporate level (Large firm)	Current tax system	7.95	7.95	4.99	37.10	37.10	-0.19	33.15	33.15	22.88
	Simple tax increase	8.05(↑)	8.05(↑)	4.97(↓)	37.88	37.88	-0.70	34.03	34.03	23.46
	CBIT	8.05(↑)	8.05(↑)	8.05(↑)	37.88	37.88	37.88	34.03	34.03	34.03
	ACE	4.85(↓)	4.85(↓)	4.97(↓)	-3.19	-3.19	-0.70	23.04	24.04	23.46
	ACC	4.85(↓)	4.85(↓)	4.85(↓)	-3.19	-3.19	-3.19	23.04	23.04	23.04
(ii) Shareholder level (Large firm)	Current tax system	7.95	15.20	4.99	55.17	76.55	28.60	55.70	67.31	50.96
	Simple tax increase	8.05(↑)	15.39(↑)	4.97(↓)	55.73	76.85	27.24	56.10	67.71	51.22
	CBIT	8.05(↑)	8.05(↓)	8.05(↑)	37.88	37.88	38.88	34.03	34.03	34.03
	ACE	4.85(↓)	12.19(↓)	4.97(↓)	26.46	70.76	28.24	51.03	62.65	51.22
	ACC	4.85(↓)	12.19(↓)	4.85(↓)	26.46	70.76	26.46	51.03	62.65	51.03
(iii) Shareholder level (SMEs: Basic rate)	Current tax system	7.63	14.58	4.97	53.29	75.56	28.33	54.33	65.94	49.89
	Simple tax increase	7.70(↑)	14.72(↑)	4.95(↓)	53.74	75.79	28.01	54.65	66.26	50.10
	CBIT	7.70(↑)	7.70(↓)	7.70(↑)	35.08	35.08	35.08	30.88	30.88	30.88
	ACE	4.95(↓)	11.97(↓)	4.95(↓)	28.01	70.23	28.01	50.10	61.71	50.10
	ACC	4.95(↓)	11.97(↓)	4.95(↓)	29.90	70.23	28.01	50.10	61.71	50.10
(iv) Shareholder level (SMEs: Reduced rate)	Current tax system	7.21	13.76	5.10	50.56	74.11	30.11	52.33	63.95	48.60
	Simple tax increase	7.26(↑)	13.86(↑)	5.08(↓)	50.91	74.29	29.90	52.59	64.20	48.76
	CBIT	7.26(↑)	7.26(↓)	7.26(↑)	31.11	31.11	31.11	26.41	26.41	26.41
	ACE	5.08(↓)	11.69(↓)	5.08(↓)	28.01	69.51	29.90	48.76	60.38	48.76
	ACC	5.08(↓)	11.69(↓)	5.08(↓)	29.90	69.51	29.90	48.76	60.38	48.76

Note: Arrows next to the right side of the cost of capital indicate an increase or decrease in the cost of capital compared with the current tax system.

Table 5 Simulation Results at Constant EATR (1) (%)

		Statutory tax rate τ	Additional tax rate τ_N	Composite cost of capital	Composite EMTR	Composite EATR
(i) Corporate level (Large firm)	Current tax system (reiterated)	30.55	0.00	6.91	27.68	29.56
	Simple tax increase (reiterated)	31.43	4.00	6.97(↑)	28.26	
	CBIT	27.70	-12.88	7.64(↑)	34.59	30.33
	ACE	42.50	54.01	4.46(↓)	-12.07	(Constant)
	ACC	42.81	55.39	4.38(↓)	-14.19	
(ii) Shareholder level (Large firm)	Current tax system (reiterated)	30.55	0.00	7.64	53.35	55.20
	Simple tax increase (reiterated)	31.43	4.00	7.70(↑)	53.75	
	CBIT	53.20	102.31	11.69(↑)	57.22	55.55
	ACE	42.49	53.93	5.34(↓)	33.23	(Constant)
	ACC	42.79	55.30	5.26(↓)	32.25	
(iii) Shareholder level (SMEs: Basic rate)	Current tax system (reiterated)	27.55	0.00	7.39	51.81	53.94
	Simple tax increase (reiterated)	28.26	4.00	7.44(↑)	52.11	
	CBIT	51.85	137.20	11.37(↑)	56.02	54.22
	ACE	38.29	60.63	5.40(↓)	34.01	(Constant)
	ACC	38.29	60.63	5.40(↓)	34.01	
(iv) Shareholder level (SMEs: Reduced rate)	Current tax system (reiterated)	23.17	0.00	7.12	49.99	52.19
	Simple tax increase (reiterated)	23.73	4.00	7.16(↑)	50.21	
	CBIT	50.02	191.98	10.96(↑)	54.38	52.41
	ACE	32.16	65.25	5.40(↓)	35.94	(Constant)
	ACC	32.16	64.25	5.56(↓)	35.94	

Note: Arrows next to the right side of the cost of capital indicate an increase or decrease in the cost of capital compared with the current tax system.

Table 6 Simulation Results at Constant EATR (2) (%)

		Composite cost of capital			Composite EMTR			Composite EATR		
		Retained earnings	Issuing new shares	Debt	Retained earnings	Issuing new shares	Debt	Retained earnings	Issuing new shares	Debt
(i) Corporate level (Large firm)	Current tax system	7.95	7.95	4.99	37.10	37.10	-0.19	33.15	33.15	22.88
	Simple tax increase	8.05(↑)	8.05(↑)	4.97(↓)	37.88	37.88	-0.70	34.03	34.03	23.46
	CBIT	7.64(↑)	7.64(↑)	7.64(↑)	34.59	34.59	34.59	30.33	30.33	30.33
	ACE	4.39(↓)	4.39(↓)	4.59(↓)	-13.80	-13.80	-9.00	30.14	30.14	30.69
	ACC	4.38(↓)	4.38(↓)	4.38(↓)	-14.19	-14.19	-14.19	30.33	30.33	30.33
(ii) Shareholder level (Large firm)	Current tax system	7.95	15.20	4.99	55.17	76.55	28.60	55.70	67.31	50.96
	Simple tax increase	8.05(↑)	15.39(↑)	4.97(↓)	55.73	76.85	28.24	56.10	67.71	51.22
	CBIT	11.69(↑)	11.69(↓)	11.69(↑)	57.22	57.22	57.22	55.55	55.55	55.55
	ACE	4.39(↓)	13.14(↓)	4.59(↓)	18.92	72.89	22.33	54.30	65.90	54.56
	ACC	4.38(↓)	13.17(↓)	4.38(↓)	18.64	72.95	18.64	54.39	65.99	54.39
(iii) Shareholder level (SMEs: Basic rate)	Current tax system	7.63	14.58	4.97	53.29	75.56	28.33	54.33	65.94	49.89
	Simple tax increase	7.70(↑)	14.72(↑)	4.95(↓)	53.74	75.79	28.01	54.65	66.26	50.10
	CBIT	11.37(↑)	11.37(↑)	11.37(↑)	56.02	56.02	56.02	54.22	54.22	54.22
	ACE	4.58(↓)	12.74(↓)	4.58(↓)	22.28	72.03	22.28	53.06	64.67	53.06
	ACC	4.58(↓)	12.74(↓)	4.58(↓)	22.28	72.03	22.28	53.06	64.67	53.06
(iv) Shareholder level (SMEs: Reduced rate)	Current tax system	7.21	13.76	5.10	50.56	74.11	30.11	52.33	63.95	48.60
	Simple tax increase	7.26(↑)	13.86(↑)	5.08(↓)	50.91	74.29	29.90	52.59	64.20	48.76
	CBIT	10.96(↑)	10.96(↓)	10.96(↑)	54.38	54.38	54.38	52.41	52.41	52.41
	ACE	4.82(↓)	12.24(↓)	4.82(↓)	26.08	70.89	26.08	51.25	62.86	51.25
	ACC	4.82(↓)	12.24(↓)	4.82(↓)	26.08	70.89	26.08	51.25	62.86	51.25

Note: Arrows next to the right side of the cost of capital indicate an increase or decrease in the cost of capital compared with the current tax system.

What is interesting in Tables 3 and 4 is the comparison of the cost of capital at the (ii) shareholder level (large firms), (iii) shareholder level (SMEs: basic rate), and (iv) shareholder level (SMEs: reduced rate) for the ACE and ACC. Intuitively, the cost of capital would be lower for (iii) and (iv) SMEs than for (ii) large firms, and even more so for (iv) the reduced rate than for (iii) the basic rate because the statutory corporate tax rate is lower. In fact, the results for the current tax system, simple tax increases, and the CBIT are consistent with this intuition.

However, the cost of capital is higher under the ACE and ACC for (iii) and (iv) smaller firms than for (ii) larger firms and for (iv) reduced rate than for (iii) basic rate; therefore, EMTR and EATR are also higher. This increase occurs owing to the additional cost of the deemed interest allowed in the ACE and ACC, as the additional cost of deemed interest is lower under a lower tax rate.

The simulation analysis results in Tables 3 and 4 indicate that the CBIT is a desirable tax system because it ensures the neutrality of all financing at both the corporate (i) and shareholder (ii), (iii), and (iv) levels. However, because it eliminates the deductibility of interest expenses, the firm would be prepared to incur a considerably higher cost of capital and EMTR. I should note that the assumptions in Tables 3 and 4 show that increasing additional tax rates result in varying tax revenues.

Therefore, in the following simulation analysis, I adjust the additional tax rate such that the composite EATR remains constant after a tax increase. Because the model in this study is based on a forward-looking effective tax rate, no variable expresses tax revenue in the model. This is because tax revenue is originally calculated using a backward-looking effective tax rate. However, as the conceptual diagram in Figure 1 illustrates, the EATR in the forward-looking effective tax rate includes the taxation of excess and normal profits, meaning that the effective tax rate includes an element that leads to future tax revenues. Therefore, I implement the EATR constant assumption as it provides a basis for evaluating the cost of capital and EMTR.

Table 5 shows the results of a simulation analysis that back-calculates the additional tax rate that would realize EATR in the case of a 4.0% additional tax increase for the respective cases of CBIT, ACE, and ACC using EATR in the case of an increase in the additional tax rate. The CBIT has a negative additional tax rate at the corporate level (i) because it eliminates the deductibility of interest expenses, which widens the tax base. The additional tax rate must be negative to maintain a constant EATR.[11] However, introducing the CBIT raises the cost of capital and EATR; under a constant EATR, introducing ACE or ACC lowers the cost of capital and EMTR.

Table 6 reports the cost of capital, EMTR, and EATR through financing under constant EATR. The CBIT raises the costs of capital, EMTR, and EATR, whereas ACE and ACC lower them. At the corporate level (i), the CBIT and ACC ensure financing neutrality. At the shareholder level (ii),

[11] At the shareholder levels (ii), (iii), and (iv) in Table 5, the additional tax rate for CBIT is above 100%, but this is not unusual for additional taxes where the tax base is a tax amount. For example, the special corporate enterprise tax uses the corporate enterprise income tax rate as its tax base, but as Table 1 shows, the current tax rate is 260%.

(iii), and (iv), the CBIT ensures financing neutrality, but the ACE and ACC do not. At the shareholder level for (ii), (iii), and (iv), the results for the ACE and ACC are almost the same.

6. Summary

In this study, I conduct a simulation analysis of the forward-looking effective tax rate based on the viewpoint that even if the corporate tax rate is raised, it is necessary to reform the tax base to maintain or lower the effective tax rate in Japan, where the corporate tax rate is scheduled to increase to support a higher defense budget. I examine the capital income tax system, including corporate and shareholder income tax, by shifting the perspective from the corporate level to the shareholder level. In particular, I examine the CBIT, ACE, and ACC policies, which are fundamental reforms of capital income tax proposed to ensure neutral financing.

This study determines the ideal policy for the fundamental reforms to the capital income tax system at the shareholder level, in conjunction with an increase in additional tax. Introducing the CBIT ensures financing neutrality at both the corporate and shareholder levels. However, eliminating interest expense deductibility raises the EMTR and EATR. Therefore, I consider lowering the cost of capital and EMTR by introducing ACE and ACC.[12]

At the corporate level, the ACC is a more effective way to ensure financing neutrality than the ACE, but at the shareholder level, these policies have the same financing neutrality. Therefore, practical considerations are more important in deciding whether to adopt ACE or ACC. The ACE has lower hurdles to adoption, as the policy is already common in many countries. Therefore, if Japan intends to increase its additional corporate income tax in the future, it may consider introducing the ACE in conjunction with the ACE to control the increase in EMTR for capital income tax.

The analysis in this study has some issues that can be addressed in future studies. First, the simulation analysis assumes a constant EATR, which is not perfectly consistent with constant tax revenue. Spengel et al. (2016) employ a similar analytical approach. Second, this study focuses on representative firms, such as large firms, SMEs, and SMEs subject to the regular and special tax rates. However, the analysis can be extended to individual firms using financial statement data. It is important to consider the impact of the tax reforms in the analysis of individual firms' effective tax rates. Third, while I assume the simplest CBIT, ACE, and ACC as the subjects of analysis, realistic tax reforms could be more moderate. For example, the allowable percentage of interest expense deductibility and the tax rate for ACE/ACC have wide ranges. Although the analysis in this study is simplistic, it considers the effects of fundamental reforms to effective tax rates.

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[12] Germany has a business tax as a form of corporate income taxation for local governments. In 2008, the government removed the deductibility of business tax, which had been deductible, and implemented a reform to broaden the tax base and lower the tax rate. Arguably, this reform moves closer to CBIT. Therefore, Japan may also consider a reform to eliminate corporate enterprise tax deductibility, which is a local corporate income tax.

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