

Corporate Tax Policy and Foreign Direct Investment:

Based on Empirical Analysis Considering Neighboring Countries' Policies

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Abstract

As economic globalization progresses, many developed countries have undertaken corporation tax reform to reduce outward foreign direct investment (FDI). Therefore, many researches which analyze the relationship between the reduction in corporation tax rates and FDI have carried out briskly. Although the conclusion is ambiguous, as far as I know, there are only a few researches that have analyzed the influence of corporation tax on FDI while considering the FDI of neighboring countries.

In practice, if the movement of capital and labor becomes active through accelerated globalization, it would seem the home-country's FDI and host-country's FDI interact with each other. The object of this paper is to analyze to what extent change in the corporation tax rate influences FDI while considering the FDI of neighboring countries. We empirically analyze FDI based on a pooled data of FDI stock among 16 countries over the period 1996-2006. Consequently, even if the FDI of neighboring countries is included in the model, the after-tax rates of return on capital in each country has a statistically significant positive effects on FDI.

I. Introduction

An accelerated globalization has affected each country's tax policy and trade policy. To reduce outward foreign direct investment (FDI) and to increase inward foreign direct investment can be an effective economic policy to increase each country's GDP and promote economic growth. Consequently, many developed countries have decreased their corporate tax rates.

Meanwhile, there has been much debate over the relationship between corporate tax and FDI. Hartman [1984] and Boskin and Gale [1984] have analyzed the effect of corporate tax on American FDI. On the other hand, Hoon [1996] has devised models to estimate the effects of corporate tax on Japanese or American FDI. Tashiro [2012] and Sato [2012] have conducted similar analyses with data from OECD countries' data.

Although, much research has been conducted on the relationship of corporate tax to FDI, it is important that we know what kind of tax policy or FDI exists in neighboring countries and its in-

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fluence on the relevant country. As, many multinational companies have experienced an increase in international capital movement, the corporate tax policy of some countries may be susceptible to the influence of those of neighboring countries. Also, it may be possible that each country's FDI will interact with each other. Therefore, we must estimate the effect of corporate tax policy on FDI while considering the FDI of neighboring countries.

The influence of the corporate tax on FDI while considering the FDI of neighboring countries is not well-documented and not much research has been done. In practice, the home-country's FDI may be influenced by the host-country's FDI in an accelerated form of globalization. This paper analyses the effect of corporate tax on FDI considering the FDI of neighboring countries with pooled data from Asian, European, and American countries.

II. Historical changes of the corporate tax rates of 16 countries

How have the corporate tax rates of 16 countries have changed up until 2006? Table I illustrates the historical changes in corporate tax rates in 16 countries from 1997 to 2006. As is discernible from this table, on average, corporate tax rates had trended downward, whereas the corporate tax rates of China, Taiwan, and Thailand, had not changed. This means that the lower income countries in Asian have a tendency to lower corporate tax rates to receive inward foreign direct investment. Consequently, the rapid growth of Asian countries has been produced by lowering corporate tax rates. Inward foreign direct investments has not only been beneficial for the Asian region, but has also contributed to economic globalization.

But each country's reduction of corporate tax rates has not always been connected with a reduction in outward foreign direct investment. Some countries, including China, and Taiwan, did not change their corporate tax rates during this period. Also, the corporate tax rate in the United States, Hong Kong, Great Britain, Malaysia only changed slightly. Indeed, Japan has a large amount of FDI in the United States, Great Britain, and China. So, I think that there are a variety of factors that influence FDI, for example per capita GDP, the difference in the corporate tax base, and exchange rates¹⁾.

Japan reduced its corporate tax rate from 51.6% to 42% between 1997 and 2000, and from 42% to 40.69% between 2000 and 2006, while, Korea reduced its corporate tax rate from 30.8% to 29.7% between 1997 and 2004, and from 29.7% to 27.5% between 2004 and 2006. A trend of decreasing corporate tax rate is common with both Japan and Korea.

1) FDI used for this paper refers to outward foreign direct investment.

Table I Historical changes in the corporate tax rates of 16 countries (%)

year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Japan	51.6	51.6	48	42	42	42	42	42	40.69	40.69
China	33	33	33	33	33	33	33	33	33	33
Hong Kong	16.5	16.5	16	16	16	16	16	17.5	17.5	17.5
South Korea	30.8	30.8	30.8	30.8	30.8	29.7	29.7	29.7	27.5	27.5
Taiwan	25	25	25	25	25	25	25	25	25	25
Indonesia	30	30	30	30	30	39	30	30	30	30
Singapore	26	26	26	26	25.5	24.5	22	22	20	20
Thailand	30	30	30	30	30	30	30	30	30	30
Philippines	35	34	33	33	32	32	32	32	32	35
Malaysia	30	28	28	28	28	28	28	28	28	28
India	35	35	35	38.5	39.55	35.7	36.75	35.88	36.59	33.66
America	40	40	40	40	40	40	34	34	40	40
Italy	53.2	41.25	41.25	41.25	40.25	40.25	38.25	37.25	37.25	37.25
England	31	31	31	30	30	30	30	30	30	30
Germany	57.5	56.6	52.3	51.6	38.36	38.36	39.58	38.29	38.31	38.34
France	36.66	41.66	40	36.66	35.33	34.33	34.33	34.33	33.83	33.33

Note: The corporation tax rate of data for Taiwan in 1997 and 1998 was collected from 328 pages edited by Arthur Andersen, a morning-sun audit corporation.

Source: KPMG [2006]

http://www.kpmg.or.jp/resources/research/r_tax200706_1.pdf; Accessed September.15 2009; p. 328.

III. Each country's corporate tax policy

Corporate tax is levied on corporate income, calculated by the net profit of a corporation. Corporate tax rates are decided to provide a good balance between income tax and other types of taxes for maintaining tax revenue, and reflecting financial and economic circumstances.

Japan's corporate tax reform has been conducted in the four stages. For example, Japan's basic corporate tax rates changed from 42% to 37.5% in fiscal year 1988 (Showa 63). Furthermore, the basic corporate tax rate was reduced from 34.5% to 30% after considering the economic circumstances but without reconsidering the tax base in the tax reform of fiscal year 1998 (Heisei 10). Secondly, to improve the neutrality of taxation to match economic activity, the basic corporate tax rates was reduced from 37.5% to 34.5% in fiscal year 1999 (Heisei 11).

What kind of corporate tax policies influence on FDI? For example, Return on investment will be damaged by investing in the host-country without calculating depreciation. Methods of calculating depreciation include the declining balance and straight line methods of depreciation. According to Korean corporate tax policy, foreigner's investment companies can be accepted under the foreign investment promotion law. The model to calculate depreciation under the Korean tax system resembles that used under the Japanese tax system. The Korean corporate tax system has adopted the straight-line method or declining balance method for tangible fixed

assets and only the former for intangible fixed assets. Otherwise, the methods for calculating depreciation in Great-Britain, France, and the United States are the declining balance and straight line methods of depreciation just like in Japan.

However, Germany only accepts the straight line method. Also, China has adopted the straight line method to set the salvage value at approximately 10% as a fundamental principle²⁾. Taking account of the capital-gains taxation of companies in host-countries, in the United States it was possible to reduce capital-gain taxation of companies during the Bush administration. Under Germany's corporation tax law, 95% of realized capital gain from stock sales is exempted from corporate tax. In China, investment companies of foreign merchants are exempt from taxation of dividend income acquired by investing in different companies within the country. Also, capital-gains of Hong-Kong, Singapore, and Malaysia are not taxed in principle.

Although, dividends income in Taiwan is partly taxed, capital gains on land are subject to taxation. In the Philippines, taxable incomes includes income earned from a business, royalties made by trading assets, and dividends, while dividends of domestic corporation are partly exempt from taxation. Thus, because taxation of capital-gains varies by country, the investment activities of multinational corporations differ in response. In Hong-Kong, tax preferences to contain the method to calculate depreciation or capital-gain non-taxation have been carried out. Table II provides an outline of each country's corporate tax policy.

Table II Each country's corporate tax policy

	depreciation	capital-gain taxation		depreciation	capital-gain taxation
China	△	×	Philippines	○	△
Hong Kong	○	×	Malaysia	△	×
South Korea	○	○	India	△	○
Taiwan	△	△	United State	○	△
Indonesia	○	○	Italy	△	○
Singapore	×	×	Britain	○	○
Thailand	○	○	Germany	△	△
France	○	○	Japan	○	△

Note: Depreciation, ○=; declining balance and straight line method of depreciation

△=; straight line method only, ×=; no tax preference for calculating depreciation

Capital-gains taxation, ○=; tax is imposed, △=; Although a tax is imposed, it has special preferential treatment,

×=; no-tax is imposed

Source: Data collected from Tohmatsu [2007], pp. 2-800; Tohmatsu [2008], pp. 114-536; Kawakami [2008], p. 253.

2) Moreover, it is important to consider whether or not to conclude a tax treaty with Japan. A total of 56 countries had concluded tax treaties with Japan by 2008, while the conclusions of an additional 45 treaties were under negotiation. The major purpose of a tax treaty is not only to prevent tax evasion and tax avoidance, and double taxation, but also to promote foreign direct investment.

IV. Previous Research

We surveyed previous researches that documented the relationship of the corporate tax to FDI. There are many studies that estimated the effects of corporate tax on inward foreign direct investment. According to Hartman [1984], there is a statistically significant positive effects between after tax rate of returns on capital and inward foreign direct investment in the United States (1965-1979) considering the investment activity of both mature enterprises and non-matured enterprise.

Boskin and Gale [1987] use the model just like Hartman's with expanded data from 1956 to 1984. However, the estimate of Hartman found a positive relationship between the after tax rates of returns on capital and inward foreign direct investment. Boskin and Gale concluded that the relationship was negative considering the tax reform of the 1980s.

Young [1988] has estimated the model added to GNP and the log of the preceding inward foreign direct investment in comparison with the previous research utilizing the expanded data from 1953 to 1984. Consequently, Young estimates that the after tax rates of returns on capital was negative regardless of whether funds were raised by retained earnings or capital transfer. Slemrod [1990] has estimated the investment function considering the difference in the effective corporate tax rates within host-countries and exchange rates. Slemrod found that reducing America's effective corporate tax rates contribute to the decrease in inward foreign direct investment.

A wide variety of Japan's previous researches have analyzed FDI as a dependent variable considering the impact of corporate tax policy on the FDI of multi-national companies. Because inward foreign direct investment was much lower than outward FDI, it was difficult to estimate the investment function taking the log as dependent variables.

For example, Hoon [1996] has estimated the investment function considering OECD countries as the object of analysis. Hoon estimates that FDI from the U.S. has been greatly influenced by the host-countries corporate tax policies, while Japan's FDI has been less influenced. Tashiro [2012] has conducted an empirical analysis considering the difference in OECD 16 countries' corporate tax laws. Also, Sato [2012] empirically analyze foreign direct investment based on a panel of bilateral foreign direct investment flows between OECD 30 countries from 1985 to 2007.

In U.S., the analysis of FDI using micro-data of companies has been conducted briskly. Examples are researches by Hines [1996], Swenson [2001], Grubert and Mutti [2000], and Altshuler, Grubert and Newlon [2001]. Similarly, in Japan, the analysis by Fukao and Yue [1997], and Maekawa [2005] was looking at the tax policy and companies' choice of location.

However, as far as I know, it seems that the relationship of corporate tax on FDI by considering

the FDI of neighboring countries is not well-documented and much research needs to be done. Therefore, this paper analyse the effect of corporate tax on the FDI considering FDI of neighboring countries with pooled data of countries in Asia, Europe and America.

V. Model

The researches of Devereux and Griffith [1998], Hoon [1996], Fukao and Yue [1997] discuss the theoretical relationship between taxation systems and FDI. Although these researches have used commonly available data, Devereux and Griffith, and Fukao and Yue have used a qualitative variable showing the locational choice of a company as an explained variable, while Hoon has used a variable which expresses the amount of FDI as a flow and a stock as the quantitative variable.

In this analysis, since FDI (stock) which is a quantitative variable has been used as explained variable, we discuss FDI in terms of the after-tax rates of return on capital like Hoon.

In calculating marginal effective corporate tax rates, the method of calculating tax rates suggested by King and Fullerton [1984] has been frequently used. On the basis of the model used by the analysis by Hoon cited King and Fullerton. our estimate model is an analysis model. The variables are as follows. (t : corporate tax rates of each country, P : price, Q : quantity, τ : the customs tariff, ω , wages, L : Labor input, Φ : the rates of capital financed by debt, i : interest rates of debt, e : the expected rates of return on owned capital)

$$\pi = (1-t)[p(Q, \tau)Q - \omega L - \phi i K] - e(1-\phi)K \quad \dots\dots\dots(1)$$

$$Q = K^\alpha L^{1-\alpha} \quad \dots\dots\dots(2)$$

$$\pi = \max(1-t)[p(K^\alpha L^{1-\alpha}, \tau)K^\alpha L^{1-\alpha} - \omega L - \phi i K] - e(1-\phi)K \quad \dots\dots\dots(3)$$

$$\frac{\partial \pi}{\partial K} = (1-t) \left[\frac{\partial p}{\partial Q} \alpha K^{\alpha-1} L^{1-\alpha} \cdot K^\alpha L^{1-\alpha} + P \cdot \alpha K^{\alpha-1} L^{1-\alpha} - \phi i \right] - e(1-\phi) = 0 \quad \dots\dots\dots(4)$$

$$\frac{\partial p}{\partial Q} \cdot \alpha \frac{K^\alpha L^{1-\alpha}}{K} \cdot K^\alpha L^{1-\alpha} + p \cdot \alpha \frac{K^\alpha L^{1-\alpha}}{K} = \phi i + \frac{e(1-\phi)}{1-t} \quad \dots\dots\dots(5)$$

$$\frac{\alpha}{K} \left[\frac{\partial p}{\partial Q} \cdot Q + P \right] = \phi i + \frac{e(1-\phi)}{1-t} \quad \dots\dots\dots(6)$$

$$\frac{1}{K} \cdot \alpha QMR(Q, t) = \phi i + \frac{e(1-\phi)}{1-t} \quad \dots\dots\dots(7)$$

$$K = \frac{MR(Q, Z)\alpha Q}{\phi i + \frac{e(1-\phi)}{1-t}} \quad \dots\dots\dots(8)$$

The symbol of π (1) denotes a profit, which is calculated by subtracting the cost of labor and capital from income calculated by multiplying price and quantity. Q (2) is the Cobb-Douglass function (K : capital, L : labor). Differentiating the symbol of π as equal to zero as a first order condition for maximizing a profit (3), capital K is expressed by (8). Therefore, FDI expressed

by K is the function of after-tax rate of returns on capital. The investment function presumed by this analysis above is as follow.

$$\text{LN (each country's FDI stock)} = \alpha + \beta \text{ LN (1 - corporate tax rates)} + C \text{ Ln (nominal per-capita GDP)} + d \text{ LN (nominal GDP)} + e \text{ LN (neighboring country's FDI)} + f \text{ (the policy variable)} + \varepsilon$$

An important explanatory variable is the after-tax rates of returns on capital (1 – corporate tax rates) which decreases as corporate tax rates become higher. What factors in determining foreign direct investment were analyzed besides this? Our empirical analysis have considered the differences in each countries' corporate tax law, neighboring country's FDI, exchange rates, nominal GDP, nominal per-capita GDP, as well as some other instruments and economic variables.

This analysis is being made into a policy variable that considers the difference in depreciation or capital gain taxation. Moreover, nominal per-capita GDP is used here instead of wages of the host country as a proxy variable³⁾. The nominal GDP of the host country was added to the variable which expresses market size. ε is a disturbance term.

VI. Data

We empirically analyze FDI based on a pooled data of FDI stock among 16 countries over the period 1996–2006. We estimate the investment function with a pooled data including China, Hong Kong, South Korea, Taiwan, Indonesia, Singapore, Thailand, the Philippines, Malaysia, India, the U.S., Italy, Britain, Germany, and France.

In this paper, we further analyze in the model where the theoretical value of FDI estimated in neighboring countries was influenced by various factors. All country' variables besides Asian or European home-country' variables equal to the mean value of the destination of neighboring country's variables. Also, U.S. neighboring country' variables are defined as the mean value of all country's variables besides the U.S. Consequently, our analysis has been conducted with the two-stage least squares method for solving the problem of endogeneity and correlated error terms of the space model⁴⁾. It is expected that neighboring country' FDI is positive with an accelerated

3) This analysis has been expanded to Asian nations; however there are some Asian countries from which data on wages of labor cannot be collected. Therefore, nominal per-capita GDP was reluctantly used as a proxy variable for wages of labor.

4) The result of the estimate by first stage OLS is as follows. Figures in parentheses are t-values.

$$\text{LN (neighboring country's FDI)} = -12.82 + 0.0004 \text{ neighboring country's exchange} \\ [-15.12] [6.094] \\ \text{rates} + 2.233 \text{ LN neighboring country's (nominal per-capita GDP)} + 0.223 \text{ LN (neighboring} \\ [13.25] \hspace{15em} [1.733] \\ \text{country's GDP)} \hspace{15em} \text{RR}=0.911, \text{S.E.}=0.270$$

globalization.

Furthermore, as the second article also explained, the calculation method of depreciation changes with countries overseas. If the declining balance method rather than the straight line method can be accepted as the calculation method of depreciation, there will be so few corporation tax burdens of a company. Here, as I pointed out in Table II, in processing the data, a country which accepts not only the declining balance method but also the straight line method is set to 3, a country which does not require the inclusion of either method is set to 2, and a country which does not accept either method is set to 1. So, it is expected that the mark for depreciation which is an explanatory variable will be positive.

Also, considering the difference in capital gain taxation from Table II, the country which imposes a tax on capital gain is set to 3, a country with special preferential treatment for capital gain taxation is set to 2, and a country that does not tax capital gains is set to 1. In order for a company to invest in a country that does not tax on capital gains, the mark for capital gains taxation is expected to be negative.

Finally the Cabinet Office has released nominal GDP and nominal per-capita GDP. Data is collected from “The current (autumn 2007) state of the world economy.” If the economy of a host country is active, it will be thought that a company will come to operate in the country.

Therefore, it is expected that the mark of the nominal GDP showing market size will be positive. Similarly, it is expected that the mark of nominal per-capita GDP from the production side will be positive. However, when the profits of a multinational company are considered, a labor wage also becomes a factor which reduces the corporate income of a company. Therefore, this mark may become negative if nominal per-capita GDP is regarded as the labor wage.

Although the data of explanatory variable and explained variable which are used for this analysis above and the expected mark were described, the estimate of the investment function performed regression analysis by means of the usual OLS here. Since an explained variable in the model

Table III Descriptive Statistics

	Average	Standard error	Minimum value	Maximum value	sample size
LN (FDI stock)	11.02	0.164	6.425	14.68	176
LN (per-capita nominal GDP)	8.991	0.113	5.984	10.69	176
LN (nominal GDP)	13.27	0.109	11.08	16.40	176
exchange rate	586.05	153.35	0.54	10260.9	176
depreciation	2.500	0.046	1.000	3.000	176
capital-gain tax	2.188	0.061	1.000	3.000	176
LN (the rate of return after tax)	-0.406	0.010	-0.856	-0.174	176
Ln (neiboring FDI)	11.79	0.068	10.09	13.99	176
LN (rational neiboring FDI)	11.77	0.07	10.33	13.82	176

Source: Data is collected from “The current (autumn 2007) world economy.” pp. 228-269; Source of Table II.

used the logarithm of FDI, the value of nominal GDP, nominal per-capita GDP, neighboring country's FDI, the rates of returns to capital after tax used the logarithm in a similar manner. Descriptive statistics for the above-described variables we use are shown in Table III.

VII. Empirical Analysis

Table IV shows the results of our analysis of the relationship corporate between tax and FDI. Our analysis is different from previous research in that it contains the FDI of neighboring countries. Therefore, since our analysis took into consideration the endogeneity and correlated error terms of the space model, not only the usual pool OLS but also two stage OLS was analyzed.

Furthermore, we conducted our analysis using after-tax rates of return on capital, economic variable, and policy variables as explanatory variables (1) (3), and exceptions to the policy variables (2) (4). As shown in Table IV, the rate of return to capital after corporate taxation has statistically significant positive effects on FDI.

It is important to note that the after-tax rate of return on capital also has a statistically significant positive effect on FDI in the model including FDI of neighboring countries. Since the FDI of neighboring countries is significant positive, the FDI of the home country may also increase by it of the neighboring countries. The result estimated from the model of (3) is common to that of (4).

The coefficient mark of nominal GDP or nominal per-capita GDP is also statistically significant

Table IV Estimate Results

	1		2		3		4	
	coefficient	t-value	coefficient	t-value	coefficient	t-value	coefficient	t-value
constant	-10.66***	-18.36	-8.925***	-12.88	-11.21***	-18.79	-9.248***	-12.68
LN (per-capita nominal GDP)	0.846***	25.52	0.934***	22.45	0.882***	28.12	0.953***	23.45
LN (nominal GDP)	0.730***	17.26	0.720***	13.79	0.754***	18.55	0.727***	14.13
exchange rate	0.00014***	6.760	7.77E-05***	3.012	0.00017***	8.256	9.12E-05***	3.539
depreciation	0.104*	1360			0.058	0.787		
capital-gain tax	-0.667***	-10.11			-0.668***	-10.45		
LN (the rate of return after tax)	2.795***	6.970	3.473***	6.908	2.895***	7.396	3.506***	6.995
Ln (neiboring FDI)	0.562***	9.600	0.285***	4.381				
LN (rational neiboring FDI)					0.568***	10.21	0.291***	4.556
R square	0.947		0.911		0.949		0.911	
standard error	0.501		0.651		0.49		0.648	
sample	176		176		176		176	
	OLS		OLS		2OLS		2OLS	

Note: Coefficients marked with***, **, *lie in the rejection region at the 1 %, 5 %, 10% significant level.

Source: Source of table III.

positive in addition to it. Therefore, the bigger the markets size of the country, the more remarkable is the increase in FDI. Also, a rise in the exchange rate may increase FDI. That is, taking Japan as an example, the weaker the yens, the larger the overseas expansion of Japan's powerful companies.

However, when the theoretical FDI of neighboring countries is taken into consideration, depreciation value has no statistically significant effect on FDI. Conversely, the coefficient mark of capital gains taxation has a statistically significant negative effect. It seems from this that FDI is increased from non-taxed capital gains.

VIII. Conclusion

As economic globalization progresses, many developed countries have undertaken corporation tax reform to reduce outward foreign direct investment. Therefore, many researches which analyze the relationship between the reduction in corporation tax rates and FDI have carried out briskly. Although the conclusion is ambiguous, as far as I know, there are only a few researches that have analyzed the influence of corporation tax on FDI while considering the FDI of neighboring countries.

In practice, if the movement of capital and labor becomes active through accelerated globalization, it would seem the home-country's FDI and host-country's FDI interact with each other. The object of this paper is to analyze to what extent change in the corporation tax rate influences FDI while considering the FDI of neighboring countries.

Consequently, even if the FDI of neighboring countries is included in the model, the after-tax rates of return on capital in each country has a statistically significant positive effects on FDI. The direct foreign investment of neighboring countries is also included in this analysis as, it is also a factor which increases the FDI of the home country. Therefore, the question is whether many powerful companies of the home country expand overseas in response to the influence of neighboring countries because of the active movement of capital and labor across the border.

But there are also some major challenges in this analysis. There are many negative inward foreign direct investment flows in many developed countries, we used outward foreign direct investment stock as an explained variable. So, even if we takes into consideration the fact that many of the explanatory variables are flow variables, it may be corrected at this point.

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Discussion of the Presentation by Associate Professor TASHIRO Masayuki

1. Summary of the paper

The paper by Professor Tashiro (hereafter ‘the paper’) empirically examines what corporate taxation policies of the home and host countries affect foreign direct investment (FDI), by taking a unique approach to the estimations. Professor Tashiro examines this issue by using the ordinary least square (OLS) and two-stage least square (TSLS) methods to conduct analysis on data from advanced countries (176 pooled samples; 16 countries for 11 years from 1996 to 2006). In the estimates, we should take into consideration that there is a strategic situation to multinational companies’ decisions on foreign direct investment, i.e., we should establish a model assuming a ‘game’ between home and host countries in terms of setting corporate tax rates and tax exemptions. The reason TSLS is used in addition to OLS is to try to control the strategic situation by introducing endogeneity.

There are other unique points to Professor Tashiro’s analysis. First, the analysis uses data for ‘outward’ FDI instead of ‘inward’ FDI. As many countries currently have corporate tax rate strategies designed to attract FDI inward, most studies on the relationship between corporate tax policy and FDI use data for inward FDI. When international comparison is the main interest of the research, however, data for inward FDI is difficult to use because the definition and collection of the data varies from country to country. The paper explains that this is one of main reasons why data for outward FDI is used instead. Second, data for outward FDI from neighbouring countries are included in the model. This arrangement is quite reasonable because it is natural to assume that multinational companies (MNCs) would react not only to corporate tax policies in the home country but also to those in foreign countries in deciding in which countries to invest. Since there are few precedent studies so far which deal with the influence of other countries’ corporate tax policies on outward FDI from other countries in an empirical analysis, this arrangement makes the analysis quite unique.

With these settings, his estimates get the following interesting findings (to simplify the explanation, we assume that the home country is Japan). Firstly, outward FDI will increase when either Japan’s corporate tax rates decline, nominal GDP increases, or per-capita GDP increases. The finding that a decrease in the corporate taxes in Japan would increase Japanese outward FDI seems to contradict generally accepted assumptions and government intentions, because countries (eg., Japan) are competing to cut corporate tax rates in order to attract foreign MNCs

to invest in them and also to encourage local MNCs to maintain or expand their local investment (therefore, a tax rate cut should make outward FDI decrease accordingly). For this point, Professor Tashiro gives a clear explanation of why this happens; the after-tax profits of Japanese MNCs increase as the corporate tax is cut in Japan, which gives the MNCs greater power to invest and therefore outward FDI increases (domestic investment increases as well, but this cannot be implied from the models).

Secondly, regarding the strategic situation, when outward FDI from other countries increases, outward FDI from Japan also increases. This finding directly leads to the question of how to interpret the background relationships of this finding, and we will discuss this point in Question 2 of the following chapter. Thirdly, there is no evidence that the favourable tax treatment (tax exemption) of depreciation of fixed assets has a statistically significant relationship on outward FDI but that for capital gains negatively affects outward FDI. This may tell us that, if the government wishes to incentivise Japanese MNCs to stay in Japan, it is better to use tax exemption for capital gains rather than other tax reduction schemes or corporate tax rate reductions.

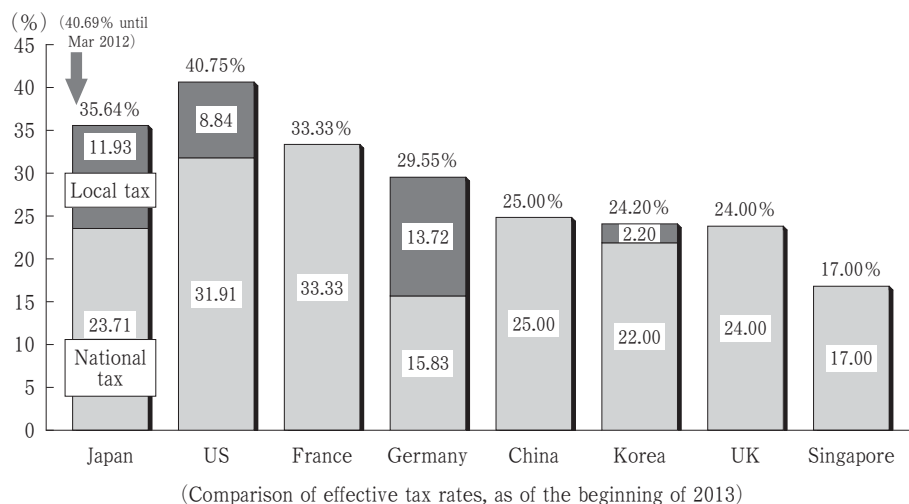
2. Questions regarding the estimates and results

A unique approach always raises questions, and Professor Tashiro's analysis is no exception to this rule. I could raise four questions here, in terms of the applicability of his estimation results to the policies which are currently being taken in the real world.

Question 1: How would the current policy direction be assessed from the analysis?

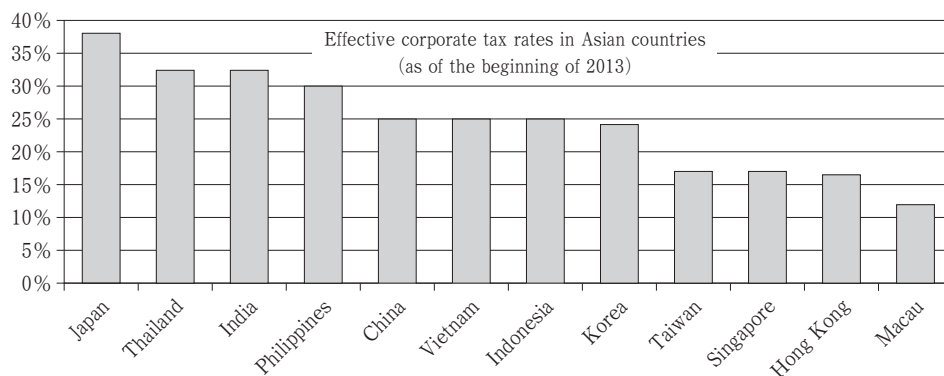
The paper uses the data for the years 1996–2006, during which Japan's corporate tax rate was one of the highest in the world (almost the same level as in the US) and other countries' corporate tax rates were also much higher than in recent years. Now, although it is still high, the effective corporate tax rate has been lowered in Japan (since FY 2012) from 40.69% to 35.64% (Figure 1)¹⁾. Many Asian countries, however, have joined in the so-called 'tax-cut competition' in addition to granting special privileged tax treatment for inward FDI in targeted industrial sectors. This tax-cut competition in Asia, especially in middle-income Asian countries (Figure 2), encourages Japanese companies (both MNCs and non-MNCs) to quit (part of) their business operations in Japan and encourages them to relocate the operations in Asian countries where the corporate tax burdens are low. This means that Japan can neither attract foreign investors to

1) Currently, however, the effective corporate tax rate is 38.01% temporarily because the special temporary additional corporate tax has been imposed to finance expenditures for reconstruction from the disaster caused by the Great East-Japan Earthquake.

Figure 1: Effective tax rates in major countries

*effective tax rate = increase in total tax burden per one unit increase in taxable income

(Source) Ministry of Finance, Japan.

Figure 2: Tax-cut competition in Asia (Asian countries' effective corporate tax rates)

(Source) Ministry of Finance, Japan.

invest in Japan nor encourage Japanese companies to maintain business operation in Japan if current corporate tax rates are unchanged.

Prime Minister Shinzo Abe announced in June 2014 that the government will cut corporate taxes in order to bring the effective corporate tax rate below 30% within a few years. We presume that the premier will take this action in order to attract more investment to Japan but, applying the result of the estimates of the paper, this would actually increase outward FDI from Japan. The paper explains that the increase in after-tax profits works as a medium of the relationship between the corporate tax rate cuts and the increase in outward FDI, i.e., the more after-tax profits, the more capacity the MNCs have for outward investment. If the estimate

succeeded in showing that MNCs also invest domestically as well as overseas when profits increase, we could say that the premier's intention to increase domestic investment will be partially met. Unfortunately, this cannot be read from the estimate results. In addition, the estimate results show that FDI from Japan increases when other countries' outward FDI increases, but other countries' tax policies do not affect domestic investment in Japan. The questions in this regard are; (1) why can Japan increase outward FDI when other countries also increase their outward FDI, despite this possibly leading to stronger international competition? and; (2) can any positive effect be expected in Japan, although the reduction of corporate tax would attract foreign businesses thinking about investing in Japan, which would lead to stronger competition in Japan as well?

Question 2: Is an increase in neighbouring countries' FDI a response to one country's policy?

In connection with question 1, the estimate results say that Japanese MNCs would rather not give way to foreign competitors but instead choose to compete or co-operate with foreign MNCs overseas when such MNCs increase their FDI in a strategic situation. However, a question remains as to what an MNC responds to. For a developed country (take Japan for example), the purpose of corporate tax policy is to promote Japanese business overseas (and domestically) as well as to attract foreign businesses to invest in Japan. Therefore, the strategic situation in the TSLS models where an MNC responds to the actions of other MNCs overseas in regard to FDI explains the real situation well. On the other hand, the corporate tax policies of a developing country aim at just attracting both domestic and foreign MNCs to invest more inwards, and a promotion scheme for outward FDI is usually introduced as part of exchange rate policy (avoiding sharp appreciation). In such a situation, we can say that Japanese MNCs would respond to the tax rate policy of developing countries and increase outward FDI accordingly. However, it is difficult to assume that Japanese MNCs respond to other MNCs' FDI strategies, because we may think that there is no practical evidence that tax rate cuts could increase outward FDI in developing countries. In the TSLS models, an increase in outward FDI in a foreign country is described as a response to the corporate tax rate reduction in the country concerned, but, taking into account the observation above, it may be difficult to think that this relationship also applies to developing countries. Since Japanese FDI nowadays goes to Asian countries rather than advanced countries, the question here is how the relationship between the increase in outward FDI in foreign countries, including developing Asian countries, and the increase in Japanese outward FDI can be interpreted.

Question 3: Effective tax rate or actual ratio of corporate taxes to net profits?

Prime Minister Abe has announced his intention of reducing the effective tax rate below 30% from its current level of 35.69% because he (and the business sector as a key supporter of his party) claims that the high level of the corporate tax rate hampers business in Japan and this will only increase in the future, taking into account the development of tax-cut competition in the world. On the other hand, there are critics who claim that actual corporate tax burdens are not as large as the premier and business sectors claim. Noguchi (2013) offers an example (Table 1) that, while the effective corporate tax rate was around 40% in recent years, the actual ratio of corporate tax burdens to the profits was around 20% in Nissan's case.

Table 1: Actual corporate tax burdens in Japan (example of Nissan)

Year	Pre-tax Profit	Corporate Tax	Ratio of corporate tax to profits	Effective corporate tax rate
2005	793.2	179.2	22.6%	40.69%
2008	767.9	190.6	24.8%	40.69%
2011	480.1	90.2	18.8%	40.69%
2012	529.3	115.1	21.8%	38.01%
2013	516.7	105.6	20.4%	38.01%

(Notes) 1. The effective corporate tax rate in 2012 and 2013 includes special additional tax to finance reconstruction budget.

2. The figures for several years are excluded in the chart, because the figures have a large fluctuations which is not related with the observation in this comment.

(Data source) Noguchi (2013)

Why this occurs is because there are tax exemptions, and the paper deals with tax treatments for depreciation and capital gains in the models. It seems to me that the initial idea of the paper is that outward FDI is affected by actual corporate tax burdens, not by the effective corporate tax rate. The estimate results show that the existence of favourable tax treatment for depreciation is not statistically significant in influencing outward FDI but favourable tax treatment for capital gains is. This creates a problem in designing an ideal tax regime for a government which aims at both preventing Japanese MNCs' from going overseas and incentivising foreign MNCs to invest in Japan. As we cannot know from the models whether a reduction of outward FDI is linked with an increase in domestic investment, we cannot judge only from the estimation results whether a combination of tax rate cut and tax exemption on capital gains is the best tax regime for the Abe cabinet. This is the third question.

Question 4: Is an increase in outward FDI a bad thing?

It seems that the paper initially assumes that an increase in outward FDI is bad for the Japanese economy, but its estimation results say that outward FDI increases when after-tax profits

increase in Japan. To me, the results may be seen as meaning that it may be difficult to judge definitively whether an increase in FDI itself is good or bad.

There are some precedent studies which show that an increase in outward FDI is good for the Japanese economy but the type of the FDI matters. Empirical analysis by Wakasugi *et al* (2008) shows that, for Japanese companies, the productivity of ‘switchers’ (companies starting business overseas) is greater than that of ‘non-switchers’ (companies conducting domestic business only). Another example is Todo and Shimizutani (2007). They show that foreign ‘innovative R & D’ activities (basic research, applied research and development for the world market) raise the productivity of the company, whereas foreign ‘adaptive R & D’ activities (development for the local market, designing for the world market, and designing for the local market) do not. The question here is whether an increase in outward FDI is therefore good or bad, or whether an additional factor needs to be considered when analysing the effects of an increase in outward FDI on the Japanese economy. However, analysis to identify the difference in economic effect caused by the different types of outward FDI may be difficult to conduct due to the limited data availability for international comparison.

3. A brief conclusion of my comments

The paper offers a unique approach to identifying the factors affecting the movement of FDI, focusing on MNCs’ outward investment in a strategic situation internationally where governments compete with each other to offer favourable corporate tax treatments, and has powerful and reasonable results. On the other hand, regarding the applicability of the results to real strategy, several questions can also be asked. Since most of the questions may come from the limitation of data availability, finding more appropriate data suitable for international comparison would strengthen the result.

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