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WORKING PAPER N° 2006 - 28

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June 2006

Abstract

This paper analyzes the effect of statutory tax rates on the location of Japanese capital in emerging countries. Considering the fact that the difference between Japan and foreign tax rates can engender transfer pricing manipulation to diminish tax liabilities, and that some firms are more able to manipulate transfer pricing, such as wholly-owned ventures and high technology affiliates, we investigate the sensitivity of Japanese capital to foreign tax rates by distinguishing wholly-owned ventures from joint-ventures and high R&D affiliates from low R&D affiliates. Based on country, parent firm and sector characteristics an investment equation is estimated on a sample of 3774 Japanese affiliates in 49 emerging countries. We obtain a greater semi-elasticity between investment and the statutory tax rate for wholly-owned affiliates and R&D intensive parents. We interpret these results as indirect evidence for abusive transfer pricing to be one of the determinants of FDI flows.

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*We Thank the University of Waseda (Tokyo) for its hospitality, Shinji Hasegawa, Shujiro Urata, Rodolphe Desbordes, Olivier Poindron, and seminar participants of Waseda University Graduate School of Asia-Pacific Studies, Waseda University Graduate School of Social Sciences and of the XIth Spring Meeting of Young Economists for helpful discussions.

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1 Introduction

Cross-country differences in corporate income tax rates may lead multinationals to find strategies in order to diminish the cost of their tax liabilities. Transfer pricing activities represent a common way to minimize the fiscal burden. Some empirical studies, such as Jenkins and Wright (1975), Grubert and Mutti (1991) or Hines and Rice (1994) show that multinational corporations take advantage of tax planning opportunities by shifting income from high tax countries to low tax countries. The widespread use of transfer pricing strategies is probably one of the main reasons why investments coming from tax credit countries are highly sensitive to low foreign tax rates. Indeed, home-host country tax differentials affect investors directly -when dividends are repatriated after some time, or in the case of a bilateral tax sparing agreement- and indirectly, by providing them with the opportunity to shift taxable income to low tax countries through transfer pricing.

Transfer pricing is a common activity, characterized by the prices used for internal sales of goods, services and technology between related parties. This activity is regular when prices are established at arm's length standard and becomes abusive when prices are conducted above or under market prices. Empirical research on transfer pricing abuse has focused mainly on firms established in developed countries, but has overlooked emerging countries, which are considered to be more vulnerable to transfer pricing manipulations. Two decades ago, papers by Brean (1979) and Plasschaert (1985) indicated that developing countries were the target of transfer pricing abuses because of the weaknesses of institutions, and the difficulty to implement a legal and regulatory framework for transfer pricing. However, the number of emerging countries interested in transfer pricing practices has considerably increased the last decade, generating the adoption of a transfer pricing legislation with penalty rules (Ernst & Young "Transfer pricing 2003 global survey"). This new attention from both emerging country policy and tax audit perspectives lends importance to this tax issue.

Furthermore, transfer pricing manipulation can be easier for certain types of companies, depending on their firm specific characteristics. For instance, the literature suggests that this manipulation can be greater when the capital is totally controlled by the parent firm, as the decision to shift profit is taken unilaterally and thus not limited by the divergent interests of a partner (Kant, 1990; Desai et al., 2004) and when the firm is intensive in technology, as the market price of a specialized product is more difficult to establish (Lall, 1979). If multinational corporations integrate transfer pricing manipulations in their investment decisions, wholly-

owned ventures and high technology affiliates should be more sensitive to the level of foreign taxes as they are more able to benefit from tax differentials.

The objective of this paper is to address these issues, first by assessing the responsiveness to taxes of the capital invested in wholly-owned ventures and joint-ventures; second, by analyzing the sensitivity to taxes of the capital invested in high R&D affiliates and low R&D affiliates. The empirical analysis is based on Japanese firm level data for the year 2001 and focuses on 49 'emerging countries'[1]. This analysis also takes in consideration tax sparing provisions, that developed countries usually agree on with emerging countries only, and which may have an impact on the sensitivity of capital to tax rates.

The paper is organized as follows. In the next section a literature review of the impact of taxation on the mode of location of FDI is presented. Secondly, a conceptual framework of credit investor responsiveness to taxes in emerging countries is proposed. Section 3 empirically analyses the effect of taxes on the amount of Japanese capital invested abroad by distinguishing the mode of establishment of the affiliate and by considering the R&D intensity of the affiliate. Section 4 offers concluding remarks.

2 Literature Review of the Impact of Taxation on the Mode of Location of FDI

A multinational corporation can produce a commodity abroad by establishing a wholly-owned venture, whose capital is 100% held, or by forming a joint-venture with another firm. Transfer pricing represents for both establishments a non-negligible way to maximize their after tax rate of return. However, the conflicting interests of partners in joint-venture entities can diminish the incentives to shift profits away, so that joint-ventures may be less sensitive than majority-owned firms to international taxation. Svejnar and Smith (1984) theoretically investigate the transfer pricing behavior of joint-ventures established in less developed countries. Using a game-theoretic approach, their results imply that in maximizing their joint profit, the partners of the joint-venture entity also try to minimize the tax liabilities in emerging host countries by adjusting transfer pricing. If, as demonstrated by Svejnar and Smith (1984), a relationship

[1]Our sample contains countries whose financial markets are commonly described as 'emerging'. Almost all could be considered 'developing' countries according to the operational classification of the World Bank, i.e. countries with gross national income below $10,065. We refer to them as 'emerging countries' throughout the paper.

between joint-ventures and transfer pricing can be established, as suggested by Kant (1990), who models the government revenue effect of transfer pricing abuses by minority-owned firms, the strategic use of transfer pricing by joint-ventures to avoid taxes is however limited by the conflict of interest that can arise between the partners. In addition, there are a few studies which explicitly demonstrate that foreign direct investment in wholly-owned establishments is more sensitive to tax rates than investment in joint-venture establishments.

Indeed, Desai et al. (2004), examine the determinants of partial ownership of U.S foreign affiliates from 1982 to 1997. By distinguishing wholly-owned, majority-owned and minority-owned firms, they analyze, among other investigations, the influence of tax policies in host countries on the desirability of forming joint ventures or wholly owned ventures. Their results suggest that tax rate differentials between the U.S and the host countries increase the likelihood of a firm of establishing wholly-owned ventures. Indeed, in the presence of tax rate differences the likelihood of establishing a wholly-owned firm is 2.38 times higher than the likelihood of establishing a partial ownership. These findings give credence to the conception that multinationals with tax planning opportunities are more likely to establish their foreign affiliates as wholly-owned entities. Two other important results strengthen this relationship. Firstly, affiliates with a higher ratio of related party sales to the affiliate's total sales, are more likely to be wholly owned. Secondly, when net incomes of partially-owned affiliates and wholly-owned affiliates are considered separately, it is found that net incomes of wholly-owned affiliates are significantly more sensitive to foreign tax rates than are net incomes of partially-owned affiliates. Thus larger trade between wholly-owned affiliates and related parties and greater sensitivity of their net income to the level of foreign taxes suggest that they are more able to practice tax planning, compared to joint-venture affiliates.

Swenson (2001) investigates the tax responsiveness of FDI in the U.S between 1984 and 1994 across 6 different forms of FDI: new plants, plant expansions, merger and acquisitions, joint ventures, equity increases and other. The data refer to 3,212 investment projects, in the manufacturing sector, realized by investors coming from 46 countries across 50 states. Her results indicate that plant creation, plant expansion and equity increase decisions are negatively and significantly correlated with the level of U.S tax rates for investors coming from tax credit system countries, with an elasticity of -5.65, -4.98 and -8.59 respectively. In contrast, joint venture decisions appear not to be influenced by taxation as the coefficient is not significant.

Desai and Hines (1999), in examining the effect of the U.S Tax Reform Act of 1986[2] on joint venture participation by U.S multinational firms, find a difference in the sensitivity of U.S investment depending on the mode of establishment of the entities. They estimate the impact of local taxation on the difference between growth rates of equity of joint ventures and majority-owned affiliates between 1982 and 1989, and find that a 1% decrease in the tax rate is linked with 10.4% slower growth of joint ventures relative to majority owned ventures.

The observation that wholly-owned establishments are more responsive to the level of foreign taxes seems to be clearly established by these empirical studies. However no one has carried out this demonstration in emerging countries, where the existence of special tax provisions can modify the sensitivity of FDI to taxes. In addition, systematic differences in the tax sensitivity of investments in high- and low-technology affiliates have never been investigated. The next section offers a simple theoretical framework, in which we show how the incidence of statutory tax rates on foreign investment depends on the mode of establishment (joint-venture versus wholly-owned venture) and R&D-intensity.

3 A Conceptual Framework for Credit Investor Responsiveness to Taxes in Emerging Countries

The Japanese corporate tax system is a credit tax system. Japanese fiscal authorities tax *worldwide* income at the domestic rate, while investors may claim foreign tax credits for any taxes paid abroad, to avoid double taxation. This system is meant to offset the effect of host-country taxation on Japanese investment behavior, and tax revenues. Indeed, as long as host countries' tax rate is lower than Japan's ('insufficient tax credit case'), the location of investment should be insensitive to local taxation.

However, three factors may restore the influence of lower foreign tax rates on investment allocation: the deferred distribution of foreign dividends, the manipulation of transfer prices, and the existence of tax sparing provisions in bilateral fiscal treaties. Deferred distribution may be profitable as re-invested foreign profits should capitalize at a higher rate than home profits, leading to a greater repatriated dividend. The manipulation of transfer prices should enhance this possibility, by allowing to shift taxable income from an affiliate located in a high-

[2]The Tax Reform Act of 1986 contains new tax provisions, such as removing worldwide averaging by creating a separate basket for dividends received by foreign corporations owned between 10% and 50% by Americans, which increase the tax cost of joint venture firms.

tax country to an affiliate located in a low-tax country. Finally, tax sparing provisions should be favorable to these tax planning opportunities, allowing investors to benefit from tax incentives that lower local tax rates even further.

In this section, we develop a simple theoretical framework to understand tax planning opportunities in the context of Japanese investment overseas. In our model, a parent company will be able to defer the distribution of foreign profits and choose the profit-maximizing transfer price, at which it exports a product to its foreign subsidiary.

Consider the case of a firm headquartered in country h, where a tax credit system applies, that owns a subsidiary in country f. We assume throughout that , $t_f \leq t_h$, where t_f is the statutory tax rate in the foreign country and t_h is the statutory tax rate in the home country[3]. Assume that in each country i, an upfront investment of k_i yields a gross profit of Π_i per unit of time, before taxation, with:

$$\Pi_h(p) = R_h(s_h) - C_h(s_h + m) + pm \tag{1}$$

$$\Pi_f(p) = R_f(s_f) - C_f(s_f - m) - p(1+\tau)m \tag{2}$$

where m is the volume of intra-firm trade flowing from country h to country f, p is the transfer price, τ is the tariff rate between the two countries, $R_i(\cdot)$ and $C_i(\cdot)$, the revenue and cost functions in country i, and s_i the level of sales in country i.

It is possible to compute the rate of return of each type of investment (at home and abroad), before taxation:

$$r_i(p) = \frac{\Pi_i(p) - k_i}{k_i}, i = h, f$$

so that, by construction,

$$k_i(1 + r_i(p)) = \Pi_i(p), i = h, f$$

Consider now an investment horizon of n periods. After-tax capitalized profits from each type of investment, distributed as a cash dividend, may be written as[4]:

[3]We focus on this situation as only one emerging country has a statutory tax rate higher than the Japanese one in our sample.

[4]These capitalized profits represent the gains after n periods, net of the initial investment (the principal). In theory, the principal may always be recovered by liquidating the subsidiary, while the liquidation value should not be subject to income taxation. Therefore, this value should not affect our calculations.

$$D_i(p) = k_i \left(1 + r_i(p)(1 - t_i)\right)^n - k_i, i = h, f$$

or, rearranging,

$$D_i(p) = k_i \sum_{j=1}^{j=n} \left[r_i(p)(1 - t_i) \left(1 + r_i(p)(1 - t_i)\right)^{j-1} \right], i = h, f.$$

We start with the case where no manipulation of transfer prices occurs. Intra-firm sales are denominated at the market price $\hat{p}$, which we assume is known to tax authorities. Given that the MNC is investing both at home and abroad, and that it originates from a tax credit system, it must hold that the pre-tax rates of return be the same, i.e. $r_h(\hat{p}) = r_f(\hat{p}) \equiv r$. However, as tax rates will differ across locations, and as a dividend may be taxed only after distribution, post-tax returns will differ if the MNC defers the distribution of foreign profits. Indeed, before distribution, dividends could be re-invested at a rate of return higher than the home rate, simply because of tax differentials.

To see this, let us compare foreign profits in the case where dividends are immediately repatriated and re-invested in home operations, and the case where they are re-invested in foreign operations during n periods. In the case of immediate distribution (ID), at time $j = 1$, profits from foreign operations are taxed at t_f, but home tax authorities offer adequate tax credits, while they tax this income at rate t_h. Afterwards, this income is re-invested in the home venture, with profits capitalizing at the rate $r(1 - t_h)$. Hence:

$$D_f^{ID}(\hat{p}) = k_f \left[r_f(\hat{p})(1 - t_h) \sum_{j=1}^{j=n} \left(1 + r_h(\hat{p})(1 - t_h)\right)^{j-1} \right] = D_h(\hat{p}) \tag{3}$$

By contrast, in the case of deferred distribution (DD), profits from foreign operations are taxed at t_f at all times, while only the dividend after n periods is taxed at t_h through the tax credit mechanism. Hence:

$$D_f^{DD}(\hat{p}) = k_f \left[r_f(\hat{p})(1 - t_f) \sum_{j=1}^{j=n} \left([1 + r_f(\hat{p})(1 - t_f)]^{j-1} \right) - r_f(\hat{p})(t_h - t_f) \sum_{j=1}^{j=n} \left([1 + r_f(\hat{p})(1 - t_f)]^{j-1} \right) \right]$$

or put simply

$$D_f^{DD}(\hat{p}) = k_f \left[r_f(\hat{p})(1 - t_h) \sum_{j=1}^{j=n} \left(1 + r_f(\hat{p})(1 - t_f)\right)^{j-1} \right] \tag{4}$$

Given that pre-tax rate of returns r_h and r_f are identical, comparisons of the second equation with the ID case is obvious. In Equations (3) and (4), the factor term can be understood as a post-tax rate of return at time of repatriation, while the sum represents the capitalized post-tax rate of return from re-investment. The latter term is simply larger under deferred distribution, all the more as tax differentials are high, hence greater dividends with deferred repatriation. This restores a role for local taxation in influencing the location of investments by firms originating from tax credit countries, such as Japan.

Differences between home and foreign country tax rates also allow multinational firms to reduce their tax liabilities by manipulating transfer prices (Grubert and Mutti, 1991). Underinvoicing exports from the firm established in the high tax country (be it the parent company or an affiliate in another country) to the firm established in the low tax country enables MNCs to shift taxable income in a profitable way. In our framework, this amounts to choose a transfer price p lower than the acknowledged market value $\hat{p}$[5]. This manipulation increases the return on foreign investment relative to that of investment at home, increasing the amount of profit reinvested in the low-tax country. This eventually reduces D_h, but increases D_f^{DD} by more because of capitalization at a higher rate. Therefore the global after tax profit of the multinational increases.

Indeed, it is easily seen from Equation (1) that $\Pi_h(p)$ is an increasing function. Similarly, it is easily seen from Equation (2) that $\Pi_f(p)$ is a decreasing function. Therefore a decrease in p must reduce the return on home investment, and increase the return on foreign investment. As the post-tax return is the product of the pre-tax return and (one minus) the tax rate, the home-foreign difference in post-tax returns must be even greater. Hence a greater incentive to defer distribution, and a greater sensitivity to local rates in the first place.

However, transfer pricing deviations from arm's length standards are prohibited by tax authorities, as they would amount to tax evasion. As suggested by Ernst & Young's "Transfer pricing 2003 global survey", transactions whose price substantially differs from the estimated market price are typically fined by tax authorities. Following Kant (1990), we introduce penalties in our framework by assuming that tax authorities may spot such manipulations with probability $\mu(|p-\hat{p}|)$, where $\mu(\cdot)$ is an increasing function and $\hat{p}$ denotes the estimated market price. Denoting the applicable fine by F, we are left with the following objective function (net

[5]Indeed Π_h would be reduced, compared to a transaction at market price, because of exports at a price lower than the market price; Π_f would be increased as the subsidiary's imports would become cheaper.

expected profits) for the multinational:

$$V(p) = D_h(p) + \alpha D_f^{DD}(p) - \alpha\mu(|p - \hat{p}|)F \tag{5}$$

where $\alpha \in [0, 1]$ denotes the share of the subsidiary's capital owned by the MNC. Therefore, the economic incentive to manipulate transfer prices, when tax rate differentials matter, should be traded-off against the expected loss from the penalty. In what follows, we assume concavity of the objective function $V(\cdot)$[6]. Therefore a unique profit-maximizing transfer price exists, implicitly defined by:

$$\frac{dV(p)}{dp} = \frac{dD_h(p)}{dp} + \alpha\frac{dD_f^{DD}(p)}{dp} - \alpha\mu'(|p - \hat{p}|)F = 0 \tag{6}$$

As discussed above, the first derivative should be positive, while the second and the third terms should be negative.

The transfer price solving this equation will not have a general analytical formulation, but rather depend on cost and revenue functions, through the return functions. However, it is possible to perform some simple comparative statics and extensions of the model to investigate the influence of ownership shares, tax sparing provisions and R&D intensity on tax planning behavior.

3.1 Joint-venture versus Wholly-owned ventures

In principle, investment in wholly-owned affiliates and joint-ventures from a credit country may be affected in different ways by the level of taxation.

It can be shown, using (6), that a larger ownership share of the affiliate translates into a higher incentive to manipulate transfer prices. Consider under-invoicing as a move $dp < 0$ from the arms' length transfer price towards the optimal price. As argued above, $dD_f^{DD}(p)$ must be positive, while $dD_h(p)$ is negative and the term involving the penalty must be negative. Then, for a negative dp, we obtain $dD_f^{DD}(p) > \mu'(|p - \hat{p}|)F$, when evaluated at the optimal transfer price. But the cross-derivative of V with respect to V and α is equal to:

$$\frac{\partial^2 V(p)}{\partial p \partial \alpha} = \frac{dD_f^{DD}(p)}{dp} - \mu'(|p - \hat{p}|) \tag{7}$$

which is negative. This means that for a negative dp, under-invoicing is all the more prof-

[6] A sufficient condition for this is that concavity of the gross profit function and convexity of $\mu(\cdot)$ jointly hold.

itable as α rises. This comes from the fact that at an optimally abusive transfer price, the gain from inflating the foreign profit by an infinitesimal amount is still higher than the rise in the penalty. Therefore, the higher the ownership share, the greater the incentive to manipulate transfer prices[7].

Note that another mechanism put forward by the literature is the existence of diverging interests between MNCs and local partners over the choice of the transfer price (Lecraw, 1985; Kant, 1990; Emmanuel and Mehafdi, 1994). Indeed, the parent company would benefit from transfer pricing alone, while partners could share the risk of being fined, and diverge on their appreciation of the optimal transfer price. Our framework does not take into account the costs of negotiating an agreement over transfer prices between partners. However, a local partner solely concerned with minimizing the expected loss from a sanction would choose $p = \hat{p}$, irrespective of her share in the venture.

This yields a testable prediction. We should observe that wholly-owned ventures are more able to manipulate transfer pricing. Therefore they should be more sensitive to tax rate levels, compared to joint-venture affiliates.

3.2 Technology Intensity

There is some evidence of differential treatment of foreign investors by host-country tax authorities according to their technological level. First, a number of countries may be particularly interested in attracting high R&D multinational firms, offering them relatively more generous fiscal incentives than to low R&D affiliates (PricewaterhouseCoopers, 2000 edition of the 'Doing Business and Investment Series'). Second, this desire to attract technological investments can be such a priority in emerging countries that tax authorities can voluntarily avoid to audit high technology affiliates, for fear of losing them to another country. Indeed, Chan and Chow (1997) have investigated the implementation of international transfer pricing legislation by Chinese tax authorities, using 81 cases on tax audits performed in 1992 and 1993 on foreign investments. They find that some categories of multinationals were never audited, namely high-technology and larger multinationals. Finally, as suggested by Lall (1979), high technology multinationals have a greater propensity to manipulate transfer pricing since the market price of very specialized products is difficult to establish. This difficulty is more pronounced for emerging countries

[7]Implicitly, we assumed that the penalty was paid by the parent company in proportion to its investment. This explains why the derivative with respect to the ownership share depends on the expected fine. Note that in the case of a fixed penalty scheme, the derivative would still be negative: we would still predict abusive transfer pricing to be likelier in wholly- rather than partly-owned affiliates.

as they suffer from "the lack of institutional framework and the inadequacy of expertise and resources to tackle this issue" (Chan and Chow, 1997, p 84).

It is therefore reasonable to expect systematic differences in transfer pricing abuses according to the technological level of products. More precisely, we hypothesize that investment in high technology affiliates is more sensitive to foreign tax rates than in low technology affiliates.

Turning back to our theoretical framework, we assume systematic differences in the expected loss from a sanction, according to the degree of R&D expenditure. This lower expected loss may come either from a lower probability of detection or enforcement, μ, for a given offense, or from more leniency in the form of a lower fine (potentially nil).

It is straightforwardly seen from (6) that a decrease in $\mu(\cdot)$ or a decrease in F imply a higher deviation from the market price. In a R&D-intensive sector, we therefore expect a higher sensitivity of investment to tax levels, all else equal.

Furthermore, we may give a prediction on the interaction between the degree of R&D and ownership shares.

$$\frac{dV(p)}{dp} = \frac{dD_h(p)}{dp} + \alpha \frac{dD_f^{DD}(p)}{dp} - \alpha \mu'(|p - \hat{p}|; E)F = 0 \tag{8}$$

where E stands for the level of R&D expenditure, with $\frac{\partial^2 \mu}{\partial |p-\hat{p}| \partial E} < 0$. Since that the deviation from the market price is the image of $\frac{dD_h(p)}{dp} + \alpha \frac{dD_f^{DD}(p)}{dp}$ by the inverse of $\mu'(\cdot)$, and that $\mu(\cdot)$ is increasing in its first argument, we expect that higher R&D levels *and* whole ownership should together increase investors' responsiveness to tax levels.

3.3 Tax sparing provisions

Emerging countries routinely offer tax incentives to foreign investors, for a number of reasons. In principle, the tax credit system, without deferral, should cancel out the effect of these incentives. However, even in the absence of deferral, the home government may protect the benefit of tax incentives offered by host governments through the signature of a tax sparing provision. Indeed, tax sparing provisions allow for the calculation of the foreign tax credit on the statutory tax rate, while tax incentives make a reduced rate apply on the actual tax liabilities. Under these provisions, multinationals simply pocket the difference[8]. Tax sparing

[8] A numerical example can be given. Consider in a first time a situation without tax incentives. The profit of a foreign affiliate in an emerging country is 100$. The corporate income tax is 20% in the host country and 30% in the home country. Firms are allowed to claim a credit to the home country for the foreign taxes paid. Thus they pay 20$ to the host country and 30-20= 10$ to the home country. In a second time, a fiscal incentive

provisions have been found to be empirically relevant for the location and magnitude of FDI in some studies, in particular in the case of Japanese firms by Azémar et al. (2006).

It is interesting to investigate the effect of tax sparing provisions on FDI in the presence of deferred distribution of earnings. Let us introduce a reduced rate t'_f in our framework, with $t'_f < t_f$. The difference between the statutory and the reduced rate, $t_f - t'_f$ is passed onto the investor in the form of reduced tax liabilities in the home country.

We may rewrite Equations (4) and (5) in order to account for the existence of tax sparing (TS) provisions:

$$V^{TS}(p) = D_h(p) + \alpha D^{DD}_{f,TS}(p) - \alpha\mu(|p - \hat{p}|)F \tag{9}$$

where

$$D^{DD}_{f,TS}(p) = k_f \left[r_f(p)(1 - t'_f) \sum_{j=1}^{j=n} \left(\left[1 + r_f(\hat{p})(1 - t'_f)\right]^{j-1} \right) - r_f(p)(t_h - t_f) \sum_{j=1}^{j=n} \left(\left[1 + r_f(\hat{p})(1 - t'_f)\right]^{j-1} \right) \right]$$

or put simply

$$D^{DD}_{f,TS}(p) = k_f \left[r_f(p)(1 - t_h + t_f - t'_f) \sum_{j=1}^{j=n} \left(\left[1 + r_f(\hat{p})(1 - t'_f)\right]^{j-1} \right) \right]$$

It is clearly seen that, all else equal, dividends repatriated from TS countries must be relatively higher. Local profits are capitalized at a preferential rate, but this may happen in a country offering incentives but without TS provisions. However, in a country having signed TS provisions, repatriated profits are taxed at a lower rate because of the artificially high credit. Besides, the profits from home operations are not affected. We conclude that TS provisions should increase the incentives to raise foreign returns by manipulating transfer prices.

In the analogue of (6), the effect of a change in the transfer price has a larger effect on $D^{DD}_{f,TS}(p)$ than $D^{DD}_{f}(p)$, all else equal. In addition, the cross-derivative of V with respect to p and α should also be of a greater magnitude.

Hence we expect that, in countries that have signed tax sparing provisions with Japan, investors should be sensitive to the difference between the statutory rate and reduced rate, compared to other countries. In these TS countries, the manipulation of transfer prices should be less likely with partial rather than whole ownership, and with low rather than high R&D

is grant by the host country and firms do not have to pay the 20% tax rate. Without tax sparing firms have to pay 30$ to the home country as they do not pay foreign taxes. With tax sparing, the 20% foreign corporate tax rate is deemed to have been paid and thus become creditable; so in that case firms pay 0$ to the host country and 30-20=10$ to the home country.

expenditure. However, these marginal effects of ownership and R&D expenditure should be less pronounced than in countries without TS provisions, because of the importance of differentials to both types of affiliates in TS countries.

Finally, we may give a prediction on the triple interaction between ownership shares, the degree of R&D, and the existence of tax sparing provisions. The presence of TS agreements should again reduce the magnitude of the difference in sensitivity between the coefficients of wholly-owned affiliates and joint-ventures, and between high and low R&D ventures. Therefore we should expect higher R&D intensity *and* whole ownership to have a smaller effect on investors' responsiveness to tax levels with TS than without.

We are now ready to apply this line of reasoning to the analysis of the determinants of Japanese FDI.

4 Empirical Test: Japanese Capital Sensitivity to Taxes in Emerging Countries

4.1 Data and Estimation

We test the influence of taxation on the international strategies of Japanese multinational enterprises in emerging countries. Our data on Japanese foreign investment flows at the affiliate level come from the 2001 annual edition of Kaigai Shinshutsu Kigyou Souran - Kuni Betsu (Japanese Overseas Investments - by country). These data are compiled by Toyo Keizai, a large statistical publisher in Japan, as part of its annual survey of the overseas investment activities of Japanese firms. The database offers exhaustive information of the level of capital invested in a country *"i"* by each Japanese subsidiary operating abroad in 2001. For each plant of the sample, affiliate- and parent-specific data are available. When the affiliate is a joint-venture firm, with two or more parents, the parent firm which possesses the larger share of the affiliate is considered.

Only emerging countries are considered in this analysis. Due to missing macro-economic data for several emerging countries, the set of countries is substantially shortened to finally focus on Japanese investments in 49 countries. Table 1 summarizes the number of Japanese establishments and the total amount of capital invested in each emerging country of the sample. Not surprisingly, China is the major recipient of Japanese capital with more than 13 billion USD in 2001. Thailand, Indonesia, Malaysia, Brazil and South Korea also represent attractive

Table 1: Japanese number of entities and capital invested in emerging countries in 2001

Country	Nbr of entities	Capital Inv.	Country	Nbr of entities	Capital Inv.
Argentina	19	302	**Mexico**	110	591
Bahrain	3	17.2	Morocco	1	0.24
Bangladesh	2	0.91	Nigeria	10	0.23
Bolivia	1	0.48	Oman	1	0.39
Brazil	156	1650	Panama	54	179
Cameroon	2	0.01	Papua N.G	1	4.20
Chile	31	302	Paraguay	2	31.2
China	1122	13300	Peru	14	38.3
Colombia	12	6.83	**Philippines**	207	1140
Costa Rica	1	2.79	Poland	32	87.2
Czech Rep.	25	178	Romania	4	0.65
Ecuador	7	9.99	Russia	15	64.8
Egypt	3	20.1	Saudi Ar.	8	89.1
El Salvador	3	24.6	Slovak Rep.	3	0.59
Ethiopia	2	0.44	South Africa	17	17.1
Ghana	1	0.96	**Sri Lanka**	7	24.5
Guatemala	2	0.59	Tanzania	2	0.25
Honduras	1	0.01	**Thailand**	665	4680
Hungary	22	255	Trinidad and T.	2	1.22
India	87	1300	**Turkey**	9	46.1
Indonesia	356	3210	Ukraine	4	2.01
Iran	13	8.24	Venezuela	16	276
Kenya	1	0.03	Vietnam	83	615
Korea	216	1480	**Zambia**	1	0.12
Malaysia	418	2780			

Notes: The capital invested is in million of USD. The countries in bold are those with whom Japan has a tax sparing provision included in bilateral tax treaties.

locations for Japanese investment which level of capital is respectively, 4680, 3210, 2780, 1650 and 1480 million of USD. At the opposite end, African countries such as Cameroon, Kenya, Nigeria, Zambia and Morocco are those in which Japanese firms invest the less.

In this paper, two modes of establishments of 3774 Japanese affiliates are distinguished: the wholly-owned venture and the joint-venture. The wholly-owned ventures, which are 100 percent owned by a Japanese parent, represent 1373 establishments in the sample of countries analyzed i.e 36.4% of the total number of affiliates. The joint-ventures, which are owned by Japanese parents with a minimum of 10 percent, represent 2401 entities i.e 63.6% of the total number of affiliates.

The model to be estimated is of the form:

$$CAP_{aphs} = f(H_h, P_p, A_a, D_s, STR_h) + \varepsilon_{aph} \tag{10}$$

The dependent variable, the affiliate-level flow of Japanese capital, "CAP_{aphs}", is regressed against a set of standard determinants specific to the host country H_h, to the parent firm P_p, to the affiliate A_a, to the sector D_s and to the host country's statutory tax rate STR_h; ε_{aph} is the error term. The natural logarithms of the variables have been taken (except for the tax variable). This has two advantages: such a transformation reduces the influence of large values and allows the coefficients to be interpreted as ordinary elasticities. The coefficient before the statutory tax rate will be directly interpreted as the semi-elasticity of investment with respect to that tax rate.

Thus, the level of foreign taxation is observed through the only available measure of tax rates in emerging countries : the statutory tax rate. These data come from the *Corporate and Individual Taxes 1999-2000 Worldwide Summaries of PricewaterhouseCoopers*. This database has the advantage to cover a large amount of emerging countries and to give the profit tax rates applicable to foreign companies, contrary to the World Tax Database which provides the statutory tax rate applicable on domestic companies only. The correlation between the statutory tax rate of the World Tax Database and the statutory tax rate of PricewaterhouseCoopers is 0.87, indicating that both measures are close to each other but that different rates can apply on domestic and foreign companies.

Country-level characteristics are considered through usual determinants such as the GDP, the GDP per capita, the distance between Japan and the emerging country, the ICRG composite risk index, the agglomeration forces and the availability of infrastructure. According to Wheeler and Mody (1992) and Mody and Srinivasan (1998), these variables are major determinants of FDI in emerging countries. Following Head et al. (1995) who consider that Japanese firms tend to locate near other Japanese firms, the measure of agglomeration is the number of Japanese affiliates located in a country *"i"*. The availability of infrastructure is measured by the per-income stock of telephone lines. This variable as the advantage to be available for numerous emerging countries and to be correlated with different kinds of infrastructure (Easterly and Levine, 1997; Collier and Gunning, 1999). Finally, we consider parent firm specific effects with a measure of the capital stock. The vector of explanatory variables used for the econometric estimation is presented in the Appendix.

4.2 Empirical Results

Table 2 reports ordinary least square estimates of the determinants of Japanese investments in emerging countries in 2001. Most of the coefficients have the expected sign and are significant across the estimations. As suggested by Schneider and Frey (1985) or Wheeler and Mody (1992), the market size, proxied by the level of GDP, appears to be an important determinant of the capital invested in emerging countries. The effect of GDP per capita is more controversial as this variable can proxy the host country's development level but also labour costs[9]. The empirical specification suggests that Japanese investments are deterred by a high level of GDP per capita. They are also discouraged by the distance between Japan and the host country, as distance can increase transaction costs such as information costs and cultural differences. The amount of capital invested is positively influenced by the number of Japanese firms. This correspond to the assumption that Japanese firms prefer to invest close to other Japanese firms in order to benefit from agglomeration spill-overs. The stock of capital of the parent firm positively affects the amount of capital invested in the affiliate, implying that large firms are more able to invest abroad. The per-income stock of telephone lines and the ICRG composite risk variables are not significant in these specifications.

Of particular interest, the statutory tax rate variable is statistically significant and has the expected sign. A 1% point increase in the statutory tax rate generates a 5.3% decrease of the capital invested abroad. Thus without distinguishing investment by the mode of establishment or by the intensity in R&D, there is support for a link between the level of foreign taxation and the amount of Japanese capital invested in emerging countries[10].

First, in order to investigate the assumption that the capital invested in wholly-owned ventures should be more sensitive to the level of taxes than the capital invested in joint-ventures, we measure and compare the sensitivity of the capital invested in both kinds of ventures to the level of foreign taxes. To fulfill, the equation in Column 2 is changed by disentangling joint-ventures from wholly-owned ventures through a multiplicative dummy. Without controlling for tax sparing agreements, the results suggest that the capital invested in joint-ventures and wholly-owned ventures reacts differently to the level of the statutory tax rate. When the effect

[9] As wages and GDP per capita can be strongly correlated, GDP per capita can also control for labour costs. A correlation about 0.7 between GDP per capita and the labour costs per worker in manufacturing coming from Rama and Artecona (2002) tends to reinforce this hypothesis.

[10] If it is well established that the level of taxes deter FDI in developed countries, this relationship is not obvious dealing with emerging countries. Indeed, very few studies focus on the effects of taxes on FDI in these type of countries and the determinants of FDI are considered to vary systematically with the level of development (Wheeler and Mody, 1992; Blonigen and Wang, 2005).

of taxation on capital is distinguished by mode of entry, the coefficient is 20% bigger for wholly-owned ventures.

However, because the effects of tax sparing provisions are not considered in this estimation, it is difficult to conclude that the capital invested in joint-ventures and wholly-owned ventures has a different sensitivity to the level of foreign taxation. First, when a tax sparing provision is in force in an emerging country, investors can fully benefit from fiscal incentives granted by the host country. Taxation deferral and transfer pricing abuses are not the only ways to preserve low corporate tax benefits. This additional factor has to be considered. Furthermore, under tax sparing, the direct relationship between the statutory tax rate and the amount of capital invested in the host country is not obvious. The characteristics of the tax sparing provision seems to suggest that multinationals have to realized a trade-off between high statutory tax rate and low statutory tax rate locations among tax sparing countries. Indeed, on the one hand the high tax rate would generate a larger fictitious tax credit to the home country which will reduce the fiscal burden owed in Japan. On the other hand, as tax incentives and exemptions are generally limited to a pre-determined number of years, Japanese multinationals may prefer to invest in low tax countries in order to not be penalized at the end of the fiscal grant. To summarize, if the statutory tax rate represents a meaningful measure of taxes[11] when analyzing the impact of taxes on the amount of capital invested in no tax sparing countries, the meaningful measure of taxes in tax sparing countries would be the difference between the statutory tax rate and the effective tax rate[12]. However, the distinction between tax sparing countries and no tax sparing countries allows two interesting investigations. On the one hand, focusing on no TS countries allows us to analyze how the sensitivity of investment to taxes depends on the ownership mode of affiliates more rigorously, without being biased by the existence of the provision. On the other hand, this distinction allows us to compare the sensitivity of capital investment to taxes according to the ownership mode between both kinds of countries.

In Column 3, we separately investigate the sensitivity of Japanese capital invested in joint-ventures and wholly-owned ventures to foreign taxation in tax sparing and no tax sparing

[11]Compare to effective tax rates, the statutory tax rate has the disadvantage to not reflect tax incentives and accelerated depreciation. However, contrary to more complex measure of taxes, it has the advantage to be easily taken into account by foreign investors.

[12]Indeed, as explained in the previous section, under tax sparing the investor can benefit from fiscal grants as he can claim to the home country a foreign tax credit for the taxes that have been "spared", i.e not actually paid in the host country. That means that if the host country statutory tax rate is 20% and that the fiscal grant offered by the host country allows the investor to pay only a 10% tax rate, the benefit for the investor will be the difference between 20% (the foreign tax credit) and 10% (the effective tax rate).

Table 2: Japanese Capital Responsiveness to Taxes: Joint venture versus wholly-owned ventures

	Dependent variable: ln Capital Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
ln GDP	0.243^a	0.247^a	0.212^a	0.190^a	0.191^a	0.178^a
	(0.061)	*(0.061)*	*(0.068)*	*(0.058)*	*(0.057)*	*(0.063)*
ln GDP per capita	-0.375^a	-0.351^a	-0.357^a	-0.212	-0.216	-0.245
	(0.120)	*(0.119)*	*(0.127)*	*(0.187)*	*(0.186)*	*(0.241)*
ln distance	-0.465^a	-0.445^a	-0.385^a	-0.307^a	-0.303^a	-0.274^a
	(0.079)	*(0.078)*	*(0.084)*	*(0.075)*	*(0.075)*	*(0.079)*
ln agglomeration	0.261^a	0.245^a	0.219^a	0.140^a	0.137^a	0.149^b
	(0.053)	*(0.052)*	*(0.065)*	*(0.049)*	*(0.049)*	*(0.063)*
ln total capital	0.335^a	0.338^a	0.336^a	0.349^a	0.349^a	0.347^a
	(0.022)	*(0.022)*	*(0.022)*	*(0.021)*	*(0.021)*	*(0.021)*
ln tel line per income	−0.278	−0.236	−0.080	−0.087	−0.078	−0.018
	(0.185)	*(0.185)*	*(0.226)*	*(0.174)*	*(0.174)*	*(0.208)*
ln ICRG	0.539	0.551	0.464	0.930	0.932	0.734
	(0.695)	*(0.691)*	*(0.700)*	*(0.656)*	*(0.656)*	*(0.667)*
STR	-5.266^a			-4.295^a		
	(1.103)			*(1.048)*		
JV*STR		-4.692^a			-4.165^a	
		(1.103)			*(1.049)*	
WO*STR		-5.593^a			-4.382^a	
		(1.092)			*(1.053)*	
JV*TS*STR			-3.655^a			-3.747^a
			(1.281)			*(1.195)*
WO*TS*STR			-4.321^a			-3.761^a
			(1.283)			*(1.199)*
JV*noTS*STR			-3.425^b			-2.878^b
			(1.368)			*(1.261)*
WO*noTS*STR			-6.133^a			-4.679^a
			(1.140)			*(1.118)*
Sector fixed effects:						
Manufacture				1.813^a	1.819^a	1.820^a
				(0.185)	*(0.185)*	*(0.186)*
Transport				−0.015	−0.011	−0.007
				(0.248)	*(0.247)*	*(0.249)*
Wholesale				0.024	0.044	0.053
				(0.199)	*(0.201)*	*(0.203)*
Retail				1.328^a	1.338^a	1.345^a
				(0.302)	*(0.301)*	*(0.305)*
Finance				1.123^a	1.133^a	1.140^a
				(0.319)	*(0.320)*	*(0.320)*
Service				−0.214	−0.200	−0.205
				(0.246)	*(0.246)*	*(0.246)*
Constant	5.810	5.738	8.153	5.373	5.373	6.017
	(5.046)	*(5.008)*	*(5.421)*	*(3.771)*	*(3.771)*	*(3.875)*
Observations	3774	3774	3774	3774	3774	3774
R-squared	0.16	0.17	0.17	0.30	0.30	0.30

Notes: The letters "a", "b" and "c" indicate respectively a significance level of 1, 5 and 10 percent. Robust standard errors are in parentheses. STR stands for statutory tax rate, JV for joint-ventures, WO for wholly-owned ventures, TS for tax sparing and noTS for no tax sparing.

countries. In no tax sparing countries the coefficient of wholly-owned ventures is 1.8 time higher than the coefficient of joint-ventures. This difference, which is statistically significant, is also predicted by Desai et al. (2004). Their analysis covers developed and developing countries, but as the United-States does not sign tax sparing provisions with developing countries, a comparison between their results and ours in that case is possible. Thus in line with the literature, our results suggest that, in no tax sparing emerging countries, the amount of capital invested in wholly-owned ventures is strongly negatively influenced by the level of taxes as a 1% point increase of the statutory tax rate generates a 6% decrease of the Japanese capital invested abroad. The capital invested in joint-ventures is less sensitive to tax rates in no tax sparing countries as capital decreases by 3.4% in response to a 1% point increase in the statutory tax rate.

In the presence of a tax sparing provision, the literature does not necessarily predict a difference in the capital sensitivity to taxes when it is invested in wholly-owned or joint-ventures affiliates. In this situation, two factors, tax deferral and tax sparing, can preserve tax benefits in the same way for both modes of establishment. Even if wholly-owned affiliates are still more able to benefit from transfer pricing, with this additional factor the capital sensitivity to taxes depending on the mode of establishment should diminish compared to the situation prevailing in no tax sparing countries. Our results indicate that a 1% point increase in the statutory tax rate decreases the capital invested in wholly-owned ventures by 4.3% and the capital invested in joint-ventures by 3.7%. Thus the magnitude of the coefficients indicates that the impact of taxes is 18% higher for the capital invested in wholly-owned affiliates in tax sparing countries and 79% higher for the capital invested in wholly-owned affiliates in no tax sparing countries.

As conditions for attracting FDI may vary by sectors, we add sectoral control dummies in Column 4, 5 and 6. Seven sectors are considered: agriculture, wholesale, retail trade, manufacture, service, transport and finance. Controlling for sector fixed effects also allow us to test the robustness[13] of previous results. We can see from the three last columns that the magnitude of the tax coefficients diminishes slightly, but that the difference of capital sensitivity observed between wholly owned ventures and joint ventures is conserved when sectoral dummies are

[13]The robustness of the results is also tested by checking for multicollinearity and by checking for model specification error. The results of these tests indicate first that the variables used in the model are not redundant as no variables can be considered as a linear combination of other independent variables. Furthermore, the interaction terms between the statutory tax rate, the ownership mode and the tax sparing situation of a country do not generate multicollinearity in the model. This can also be checked by the stability of the standard errors across estimations (there are not inflated when interaction terms are added). Second, tests detecting specification errors indicate that no relevant variables have been omitted from the model.

included.

We next consider whether the capital invested in affiliates with higher R&D expenditures is more sensitive to the level of corporate tax rates than low R&D affiliates. As discussed above, the paper of Chan and Chow (1997) found evidence that high-technology firms, which are more able to manipulate transfer pricing (Lall, 1979), are not audited by authorities in China to avoid the risk of losing them to other countries. Thus, we predict that the effect of the statutory tax rate on Japanese capital investment should be stronger for high R&D affiliates. Following Blonigen (1997), affiliates are considered to be high R&D affiliates if the R&D as a percentage of sales of its parent is above average. All other affiliates are considered to be low R&D affiliates. In Column 1 of Table 3, we first simply investigate the sensitivity of Japanese capital to foreign corporate tax rates by distinguishing high R&D affiliates from low R&D affiliates. Without controlling for tax sparing provisions, we obtain a statistically significant greater semi-elasticity between Japanese capital and taxes for R&D intensive firms. Column 2 presents the estimates considering separately high R&D joint-ventures, low R&D joint-ventures, high R&D wholly-owned ventures and low R&D wholly-owned ventures, which are also dummy variables interacted with the statutory tax rate. The results indicate that the capital of high R&D joint-ventures and wholly-owned ventures is more reactive to the level of statutory tax rate compared to low R&D affiliates. The coefficient estimated for wholly-owned affiliates is 33% higher for high R&D affiliates than the coefficient for low R&D affiliates. Dealing with joint-ventures, the coefficient estimated is 16% higher for high R&D affiliates compared to low R&D affiliates. The difference between the magnitude of the coefficients of high R&D and low R&D affiliates is statistically significant.

In addition to this test, we next run a similar equation by distinguishing the impact of taxes on the capital invested in high R&D and low R&D affiliates in tax sparing and no tax sparing countries. Firstly, Column 2 of Table 3 shows that there is evidence that the capital invested in high R&D joint-ventures and high R&D wholly-owned ventures is more deterred by foreign taxes compared to low R&D affiliates in both tax sparing and no tax sparing countries. In no tax sparing countries the capital invested in wholly-owned affiliates is twice more responsive to the level of taxes when the affiliate is intensive in R&D. If the amount of capital invested in joint-ventures is strongly influenced by taxes when the affiliate is a high R&D one, the coefficient is not significant for low R&D affiliates. In tax sparing countries the magnitude of these differences is less important with 23% between high and low R&D wholly-owned affiliates

Table 3: Japanese Capital Responsiveness to Taxes: High-R&D versus low-R&D affiliates

	Dependent variable: ln Capital Investment					
	(1)	(2)	(3)	(1)	(2)	(3)
ln GDP	0.240^a	0.242^a	0.200^a	0.186^a	0.186^a	0.164^a
	(0.061)	*(0.060)*	*(0.067)*	*(0.057)*	*(0.057)*	*(0.062)*
ln GDP per capita	−0.367^a	−0.340^a	−0.322^b	−0.233	−0.237	−0.296
	(0.119)	*(0.119)*	*(0.127)*	*(0.185)*	*(0.185)*	*(0.237)*
ln distance	−0.460^a	−0.442^a	−0.362^a	−0.303^a	−0.300^a	−0.246^a
	(0.079)	*(0.078)*	*(0.084)*	*(0.075)*	*(0.075)*	*(0.078)*
ln agglomeration	0.258^a	0.242^a	0.221^a	0.138^a	0.136^a	0.153^b
	(0.052)	*(0.052)*	*(0.064)*	*(0.049)*	*(0.049)*	*(0.063)*
ln total capital	0.365^a	0.367^a	0.362^a	0.376^a	0.377^a	0.371^a
	(0.024)	*(0.024)*	*(0.024)*	*(0.023)*	*(0.023)*	*(0.023)*
ln tel line per income	−0.249	−0.201	0.005	−0.062	−0.054	0.066
	(0.184)	*(0.183)*	*(0.224)*	*(0.173)*	*(0.172)*	*(0.204)*
ln ICRG	0.487	0.491	0.217	0.885	0.887	0.465
	(0.692)	*(0.689)*	*(0.701)*	*(0.653)*	*(0.653)*	*(0.665)*
STR*highR&D	−5.841^a			−4.860^a		
	(1.108)			*(1.050)*		
STR*lowR&D	−4.787^a			−3.857^a		
	(1.098)			*(1.043)*		
JV*STR*highR&D		−4.961^a			−4.733^a	
		(1.110)			*(1.058)*	
JV*STR*lowR&D		−4.310^a			−3.743^a	
		(1.096)			*(1.044)*	
WO*STR*highR&D		−6.497^a			−4.945^a	
		(1.120)			*(1.081)*	
WO*STR*lowR&D		−4.887^a			−3.933^a	
		(1.085)			*(1.051)*	
WO*STR*lowR&D*noTS			−3.941^a			−2.502^b
			(1.259)			*(1.248)*
WO*STR*lowR&D*TS			−3.357^a			−2.979^b
			(1.289)			*(1.198)*
WO*STR*highR&D*noTS			−8.244^a			−6.707^a
			(1.329)			*(1.275)*
WO*STR*highR&D*TS			−4.241^a			−3.145^b
			(1.318)			*(1.225)*
JV*STR*lowR&D*noTS			-1.255			-0.374
			(1.465)			*(1.325)*
JV*STR*lowR&D*TS			−2.862^b			−2.826^b
			(1.284)			*(1.191)*
JV*STR*highR&D*noTS			−5.604^a			−5.478^a
			(1.631)			*(1.492)*
JV*STR*highR&D*TS			−3.188^b			−3.456^a
			(1.306)			*(1.210)*
Sector fixed effects:						
Manufacture				1.850^a	1.854^a	1.864^a
				(0.184)	*(0.184)*	*(0.183)*
Transport				−0.007	−0.004	−0.002
				(0.247)	*(0.246)*	*(0.244)*
Wholesale				0.085	0.103	0.115
				(0.198)	*(0.200)*	*(0.198)*
Retail				1.328^a	1.337^a	1.379^a
				(0.297)	*(0.297)*	*(0.298)*
Finance				1.149^a	1.158^a	1.172^a
				(0.315)	*(0.315)*	*(0.313)*
Service				−0.184	−0.171	−0.204
				(0.247)	*(0.247)*	*(0.244)*
Constant	5.948	5.995	9.416^c	5.332	5.266	6.789^c
	(5.024)	*(4.984)*	*(5.353)*	*(3.759)*	*(3.748)*	*(3.817)*
Observations	3774	3774	3774	3774	3774	3774
R-squared	0.17	0.17	0.18	0.30	0.30	0.31

Notes: The letters "a", "b" and "c" indicate respectively a significance level of 1, 5 and 10 percent. Robust standard errors are in parentheses.

and 12% between high and low R&D joint-ventures, but this last difference is not statistically significant. Secondly, the capital of wholly-owned affiliates is more sensitive to the level of foreign taxation compared to joint-ventures affiliates in no tax sparing countries. This difference is noticeable for both high R&D and low R&D affiliates. A 1% point increase of the statutory tax rate engenders a decrease of 8.2% of the capital invested in high R&D wholly-owned and a decrease of 5.6% of the capital invested in high R&D joint-ventures. This difference is even more striking for low R&D affiliates as a 1% point increase of the statutory tax rate generates a decrease of 3.4% of the capital invested in wholly-owned affiliates and has a non-significant impact on the Japanese capital invested in joint-ventures.

In column 4, 5 and 6 sectoral control dummies are included. As in Table 2, these control variables slightly diminish the magnitude of the tax variable coefficients, however, the differences observed among the tax interaction term coefficients are maintained when considering sector fixed effects.

These findings have an interesting implication. Japanese investors seem to take advantage of tax planning opportunities as we can observe a strongly and significant relationship between tax rates and the amount of capital invested in emerging countries. In the same way, Swenson (2001) finds that Japanese investments in the U.S between 1984 and 1994 are strongly deterred by the level of taxes as the probability to invest in U.S is negatively correlated with the level of taxes; the elasticity is between 3.27 to 6.24, depending on the estimations. As Swenson underlined, the level of foreign taxation should not display such a strong effect on the activity of Japanese investors as the Japanese tax system should neutralize the attractiveness of low tax states or countries. Furthermore, if we consider that the ability to manipulate transfer pricing is the only characteristic that distinguishes joint-ventures from wholly-owned ventures and high R&D affiliates from low R&D affiliates in their behavioral response to taxes, the diverging sensitivity to the level of taxes can be interpreted as tax manipulations to diminish the total amount of tax abilities. The literature predicts that wholly-owned ventures and high R&D affiliates are more able to realize transfer pricing. Our results indirectly support these assumptions as the capital invested in these types of affiliates strongly react to the level of taxes. The only kind of affiliates which are not responsive to the level of taxes, as normally expected absent tax planning opportunities, are the low R&D joint-ventures, operating in no tax sparing countries, which are considered to be the less likely to manipulate transfer pricing.

5 Conclusion

To achieve a variety of economic policy objectives, tax systems are used by governments. In addition to finance government expenses and to provide some redistribution of income, taxation can be used to attract foreign capital through a competitive corporate tax rate and advantageous fiscal incentives. Considering the case of investors coming from a tax credit country - which is supposed to neutralized the influence of low foreign tax rates - the effect of international taxation on capital invested abroad is not obvious. Analyzing three factors that can restore the influence of foreign tax incentives on the location of capital: tax deferral, transfer pricing and tax sparing provisions, this paper attempts to shed light on the tax planning strategies of multinational enterprises. Specifically, a theoretical framework highlights that firms which are more likely to manipulate transfer pricing, such as wholly-owned ventures and high R&D affiliates, should be more sensitive to the level of foreign taxes when investing in no tax sparing countries. Under tax sparing provisions, the differences between the sensitivity of capital to taxes depending on the mode of establishment or on the R&D should be less important, as the provision allows for a direct preservation of tax benefits for all affiliates. Using Japanese foreign investment data for 2001, our empirical analysis shows as expected a stronger relationship between statutory tax rates and the Japanese capital invested in wholly-owned affiliates and high R&D affiliates compared to joint-ventures and low R&D affiliates. In tax sparing countries the capital invested in different kinds of affiliates reacts in approximately the same way to the level of corporate tax rate. These results support the claim that in order to assess the effects of taxation on the behavior of multinationals, it is not only necessary to consider host and home country tax systems in interaction, but also to look beyond the tax planning opportunities associated with the investors' strategies to maximize after-tax rate of returns.

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6 Appendix

6.1 Data Appendix

Market size (GDP): The gross domestic product is measured at market price in current US dollars. These data are from the "Global Development Network Growth Database" published by the World Bank.

GDP per capita: These data are from the "Global Development Network Growth Database" published by the World Bank.

Distance: The distance data, between the host country and Japan, are from the CEPII.

Telephone lines/GDP: According to Easterly and Levine (1997) and Collier and Gunning (1999), while telecommunications is the only infrastructure variable widely available for emerging countries, it is likely that different kinds of infrastructure are highly correlated. However, the variation in stock of telecommunications can be explained by GDP per capita (Forestier et al., 2002), thus Fink and Kenny (2003) propose to measure infrastructure by the per-income stock of telephone lines in order to avoid correlations with market related variables. These data are from the "Global Development Network Growth Database" published by the World Bank.

Agglomeration: The measure of agglomeration is the number of Japanese affiliates located in a country "i". These data are from the edition 2001 of the Toyo keizai database.

ICRG: The International Country Guide Risk publishes a composite risk rating of economic, financial and political risks. Maximum rating are 100 and minimum rating are 0. A higher score indicates a lower risk.

Total capital: The total capital is the stock of capital of the parent company. These data are from the edition 2001 of the Toyo keizai database.