

Competitiveness of Japanese Industry/ Multinationals and the Cross-border Corporate Taxation

A Geometric and Analytic Study Preliminary to
Exploring for the Empirical Evidence

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Abstract

Assuming a simplified two-country (Japan-EU) world, the paper shows, first, that tax-based competitiveness as newly proposed in terms of average after-tax return-on-assets differentials applies to all three cases of taxation-induced distortion (that is, distortions of location of the assets, of their ownership, and of both location and ownership) under either cross-border/international corporate taxation of a worldwide system and territoriality. Second, it is shown that in equilibrium, Japanese industry defined based either on ownership or location will be equally competitive with the similarly defined EU industry.

1 Introduction

The present paper attempts to contribute to the literature by combining Knoll (2010) and Boyer (2014) in the manner that tax-based competitiveness is directly measured by after-tax rates of return on assets/investment (abbreviated as ROAs) as suggested by Boyer, for each of ownership-based and location-based definitions of an industry/ multinationals as geometrically suggested by Knoll, under each of the two

*Department of Commerce, Seinan Gakuin University, Fukuoka, Japan. E-mail: kojima@seinan-gu.ac.jp The present paper analyzes two (ownership- and location-based) types of competitiveness of the Japanese industry/multinationals, the former of which is closely related to Kojima (2016), the panel data econometric research on the effect of corporate taxation on the location choice of Japanese multinationals.

alternative cross-border/international corporate tax systems, a worldwide system and territoriality.

Knoll (2010) measures the tax-based competitiveness by the number of assets (owned or located domestically and/or overseas) increased or decreased as a result of international corporate taxation. The present paper will rather take Boyer's (2014) approach in the sense that the number of assets as such is considered a *consequence* of competitiveness and, instead, the tax-based competitiveness will be *directly* measured by the average after-tax ROA differentials between Japan and a foreign country. We maintain that the number of assets (owned or located domestically and/or overseas) will change in consequence of the better or worse average after-tax ROA differentials which the present paper considers a direct measure of the competitiveness.

The objective of the paper is thus to propose to measure tax-based competitiveness of a Japanese industry/multinational firms as against a non-Japanese counterpart, by differences between Japan and a foreign country in the average after-tax ROA differentials.

At the central part of the study are two alternative definitions of an industry/multinationals and two systems of international corporate taxation, each of which will be characterized as follows:

Two alternative definitions of an industry/multinationals are ownership-based and location-based definitions (Knoll 2010). And associated with the two definitions are efficiency advantage from locating the assets in Japan [a foreign country] for an ownership-based Japanese industry and productivity advantage from Japanese [foreign] ownership of the assets for a location-based Japanese industry (Knoll 2010); in the present study, the two types of efficiency here will be numerically measured by the average ROA differentials.

Currently two alternative international corporate tax systems (that is, worldwide system and territoriality) exist; in the present study, the after-tax ROAs will be computed under each of the two alternative systems of international corporate taxation.

Tax-based competitiveness of an industry/multinational firms depends on the definitions of the industry (Knoll 2010). How it does will be studied and formally shown in the present study, using the average ROA differentials, under each of the two alternative international corporate tax systems (as will be formally shown in Subsections 4.4, 5.2.1.b and 5.2.2.b).

The paper proceeds as follows: In Section 2, the literature is reviewed

on tax-based competitiveness, definitions of an industry or multinationals, and quantitative measures of the competitiveness. Based on Appendix A, which summarizes Knoll's (2010) two definitions of an industry and its tax-based competitiveness, Section 3 defines a Japanese industry or multinationals, for each of which tax-based competitiveness will, in turn, be defined based on average after-tax ROA (rather than on the number of assets owned by the industry at home or abroad). A geometry and simplified analytics of tax-based competitiveness of Japanese industry/multinationals are studied in Section 4 for the case of no corporate taxation-induced distortions and in Section 5 (focusing on tax-induced effect on equilibrium and competitiveness, together with Appendix B summarizing Knoll's (2010) geometry of a tax-induced consequence of competitiveness of an industry), for the case of corporate taxation-induced distortions. Several concluding remarks are made in the final section. Appendix C summarizes, in two tables, the two international corporate tax systems, a worldwide system and territoriality.

2 Literature Review

Three past studies attempting to explicitly define competitiveness in their contexts include Knoll (2010), Drabkin, et al. (2013) and Pomerleau, et al. (2015), all of which define *tax-based* competitiveness: the first two focus on competitiveness of an industry or multinationals, while the last that of a country as whole. In particular, Knoll (2010, pp.772-774) argues that “‘(C)ompetitiveness’ is not a precisely defined term in economics. ... Competitiveness can mean different things to different people and at different times. It also can apply at different levels of the economy. Competitiveness is sometimes said to be a characteristic of firms, of industries, or even of entire countries.”

Knoll (2010) then gives two alternative definitions of an industry/multinationals, as summarized in Appendix A: ownership-based and location-based definitions, for each of which tax-based competitiveness of an industry/multinationals is measured based on the number of assets (owned or located domestically and/or overseas) increased or decreased as a result of international corporate taxation.

Meanwhile, Boyer (2014, pp.2-3, 12-19) suggests that after-tax ROA be considered a *direct* measure of tax-based competitiveness, whereas the number of assets owned by an industry in its home country or overseas a *consequence* of competitiveness. That is, an improved competitiveness

as indicated *directly* by an industry's higher ROA (relative to the foreign industry's ROA) will possibly lead to an increase in the number of assets owned by the industry at home or abroad.

Further, the following past studies are found informative and elucidative (and thus frequently quoted in the two tables in Appendix C) to better grasp the two international corporate tax systems in the United States, Japan and the United Kingdom: Knoll (2010), McIntyre (2011), Dittmer (2012), Drabkin, et al. (2013), Dubay (2013), Matheson, et al. (2013), Badley, et al. (2014), Hasegawa, et al. (2015) and OECD (2015). Matheson, et al. (2013) studies what would be implied, for low-income countries in particular, by their transition from worldwide taxation to territoriality, with regard to their ability to generate tax revenues from profits on their inbound foreign direct investment.

3 Two Definitions of a Japanese Industry and Its Tax-based Competitiveness: Combining Knoll (2010) and Boyer (2014)

Based on Appendix A, which summarizes Knoll's (2010) two definitions of an industry and its tax-based competitiveness, the present section defines a Japanese industry or multinationals, for each of which tax-based competitiveness will, in turn, be defined and measured based on average *after-tax* ROA as suggested by Boyer (2014) (rather than on the number of assets owned by the industry at home or abroad as suggested by Knoll 2010).

3.1 Economic metrics of tax-based competitiveness

Three past studies attempting to explicitly define competitiveness in their contexts include Knoll (2010, pp.774-778), Drabkin, et al. (2013, pp.27-28) and Pomerleau, et al. (2015), all of which define *tax-based* competitiveness: the first two focus on competitiveness of an industry or a multinational, while the last that of a country as whole. The present study will rely on definitions given by the first two, in particular.

3.1.1 A metric newly proposed and employed

More specifically, in the present paper, the degree of tax-based competitiveness of a Japanese industry as against a non-Japanese industry is measured by average *after-tax* ROA (an indicator of profitability on foreign sales) *differentials* indicating advantage from location or ownership of the assets as follows:¹ The Japanese industry will be more competitive than the non-Japanese industry if its average after-tax ROA differential for assets (such as manufacturing plants) is greater than that for the non-Japanese industry, as will be later given formally in Subsection 4.4 on.

Under no corporate taxes or equal taxes across countries Note that, with this metric, the Japanese industry/multinationals will be more or less competitive even if there are present no corporate taxes or equal taxes across countries, under which the Japanese industry/multinationals and the non-Japanese industry/multinationals will still differ in the (before-tax) ROA for asset due to differing *non-tax* production costs. See Section 4.

3.1.2 An alternative metric

Another quantitative measure of an industry's tax-based competitiveness would be the ownership or location of assets in the home country or overseas, as proposed by Knoll (2010):² The Japanese industry will be *less* competitive than the non-Japanese industry if the Japanese corporate tax discourages either ownership of the assets or their location in

¹As suggested by Boyer (2014, pp.2-3, 12-19), after-tax ROA may be considered a *direct* measure of tax-based competitiveness, whereas the number of assets owned by an industry in its home country or overseas a *consequence* of competitiveness. That is, an improved competitiveness as indicated *directly* by an industry's ROA will possibly lead to an increase in the number of assets owned by the industry at home or abroad. See the paragraph immediately below Eq. (15) in Subsection 5.2.1.b.

Another similar measure of the consequence of competitiveness may be the (logged) number of Japanese subsidiaries chosen to be located in host countries, which is used as a dependent variable in the two panel data econometric studies Kojima (Table 1, p.43, 2014) and Kojima (Table 3, p.51, 2016), respectively, on the determinants of Japanese business entry into the North American market and the effect of corporate taxation on the location choice of Japanese multinationals.

²The metric here is in effect "a consequence of competitiveness": See the very first footnote in Subsection 3.1.1.

Japan while encouraging them in the non-Japanese countries; for details see Subsections A.1.2 and A.2.2 in Appendix A.

Under no corporate taxes or equal taxes across countries Note that, with this metric, all multinationals of any nationality will be equally competitive if there are present no corporate taxes or equal taxes across countries, under which no changes are assumed to occur in the ownership or location to induce changes in competitiveness. See Appendices A and B.

3.2 Two definitions of a Japanese industry and its tax-based competitiveness

Competitiveness of an industry depends on how the industry is defined (Knoll 2010, pp.774-778). There are two alternative definitions of an industry: Ownership-based and location-based definitions, which are geometrically shown, respectively, as a pair of horizontal quadrants 1 and 2 and a pair of vertical quadrants 1 and 4, in Fig. 1 (as applied to U.S. auto industry by Knoll 2010, pages 775 and 789). In the figure $R_\ell^o(i)$ denotes the *before-tax* ROA for asset i which is located in country ℓ and owned by country o 's industry.

For each of the two definitions competitiveness of the industry will be measured in the subsequent sections, as follows:

3.2.1 Using the alternative metric

The (alternative) measure (as described as a consequence of competitiveness in Subsection 3.1.2) is exemplified by Knoll (2010, pp.777-778): See Appendix A.

3.2.2 Using the metric proposed: Simplified analytics

The measure as newly proposed in Subsection 3.1.1 will involve the *average* ROAs computed based on $R_\ell^o(i)$ as drawn in Fig. 1. The space (simple, cross-sectional) average before-tax ROAs for each definition of an industry in and outside Japan may be computed as follows: For *quadrants 1 and 2*, respectively,

$$\bar{R}_J^J = \frac{1}{n_1} \sum_i R_J^J(i) \text{ and } \bar{R}_{NJ}^J = \frac{1}{n_2} \sum_i R_{NJ}^J(i); \quad (1)$$

for quadrants 3 and 4, respectively,

$$\bar{R}_{NJ}^{NJ} = \frac{1}{n_3} \sum_i R_{NJ}^{NJ}(i) \text{ and } \bar{R}_J^{NJ} = \frac{1}{n_4} \sum_i R_J^{NJ}(i). \quad (2)$$

The metric proposed here will be applied in Subsection 4.4, where there are assumed no corporate taxes or equal taxes across countries.

| | | |
|--|---|---|
| <p>Outbound FDI 2</p> $b_{NJ}^J(i)$ $R_{NJ}^J(i)$ $i = 1, \dots, n_2$ | <p>Domestic DI 1</p> $a_J^J(i)$ $R_J^J(i)$ $i = 1, \dots, n_1$ | <p>Assets Productively Owned (Investment/Production) By Japanese Firms/Industry [<i>Ownership</i>-based definition of a Japanese Industry: Quadrants 1 and 2]</p> |
| <p>3</p> $c_{NJ}^{NJ}(i)$ $R_{NJ}^{NJ}(i)$ $i = 1, \dots, n_3$ | <p>Inbound FDI 4</p> $d_J^{NJ}(i)$ $R_J^{NJ}(i)$ $i = 1, \dots, n_4$ | <p>Assets Productively Owned (Investment/Production) By Non-Japanese Firms/Industry</p> |
| <p>Assets Efficiently Located (Investment/Production) Outside Japan</p> | <p>Assets Efficiently Located (Investment/Production) In Japan [<i>Location</i>-based definition of a Japanese Industry: Quadrants 1 and 4]</p> | |

Figure 1 Two Definitions of a Japanese Industry. Note 1: The figure is charted based on Figures 1 and 2 as drawn and applied to U.S. auto industry by Knoll (2010, pages 775 and 789); see Appendices A and B for details. Note 2: “Non-Japanese” and “Japanese” represent the nationality of the firms/industry; “Domestic,” “Outbound” and “Inbound” mean, respectively, “Japan’s,” “outflow from Japan” and “inflow into Japan”; FDI stands for foreign direct investment. Note 3 on, for example, d_J^{NJ} : The subscript ($\ell =$) J denotes the location of the assets and the superscript ($o =$) NJ their ownership. Note 4: Quadrant q is assumed to contain n_q assets.

4 A Geometry and Simplified Analytics with Neither Ownership- Nor Location-distortion

For simplifying purposes, consider a world with two jurisdictions (countries/regions): Japan and the European Union (EU), a representative non-Japanese country/region (Knoll 2010, p.789).

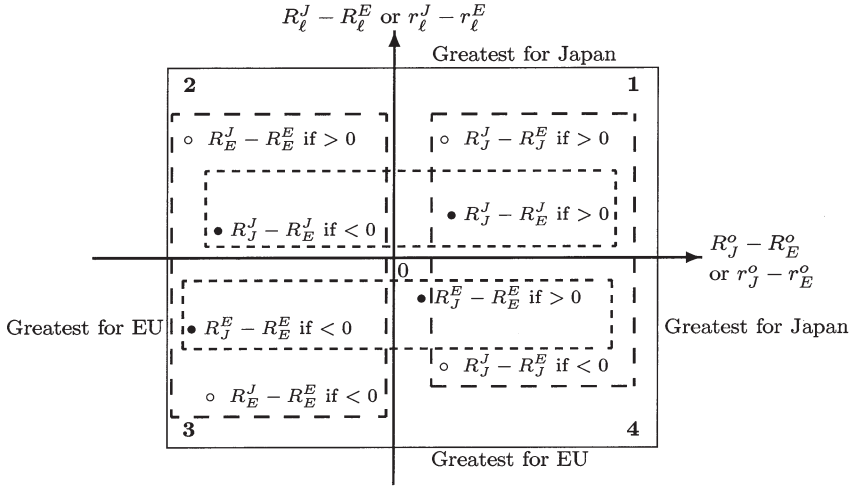


Figure 2 ROA Differentials Measuring Efficiency Advantage with respect to Location, for an Ownership-based Industry (Horizontal Axis) and Productivity Advantage with respect to Ownership, for a Location-based Industry (Vertical Axis). Note 1: The thick vertical and horizontal axes correspond, respectively, to the thick vertical and horizontal lines in Fig. 3; see Subsections 4.1 through 4.3 for details. Note 2: Asset indices i_1 through i_4 , respectively, for quadrants 1 through 4 in Fig. 1 or 3 are here omitted for ease of exposition; the large [negative] value of the ROA differential $R_o^J - R_o^E$, for each $o = J, E$, indicates efficiency advantage from locating the assets in Japan [in EU] and that of the ROA differential $R_\ell^J - R_\ell^E$, for each $\ell = J, E$, productivity advantage from Japanese [EU] ownership of the assets; at the origin there will be observed neither efficiency advantage nor productivity advantage. Note 3: See Subsection 5.2.1 for the after-tax ROAs r .

Suppose there exist no distortions (no corporate income taxes or equal

4.1.1 Numerical measures of efficiency advantage and productivity advantage: Simplified analytics

In Fig. 2, we propose to numerically measure (O) *efficiency advantage from locating the assets i_1 and i_2 (respectively, in quadrants 1 and 2 in Fig. 1 or 3) in Japan [EU] for an ownership-based Japanese industry* and (L) *productivity advantage from Japanese [EU] ownership of the assets i_1 and i_4 (respectively, in quadrants 1 and 4 in Fig. 1 or 3) for a location-based Japanese industry*, respectively, by the ROA differentials, (O) $R_J^o - R_E^o$ and (L) $R_\ell^J - R_\ell^E$, o and $\ell = J$.

4.1.2 Graphical and formal definitions of equilibrium

The thick (vertical and horizontal) lines intersecting in Fig. 3 each indicate equilibrium pairs of location and ownership of the assets in which there will be, respectively, (O) no efficiency advantage from locating the assets in Japan [EU] for an ownership-based industry and (L) no productivity advantage from Japanese [EU] ownership of the assets for a location-based industry, in the sense that the rates of return on investment are equal in such a way that, for any i_1 through any i_4 (which are indices for assets, respectively, in quadrants 1 through 4 in Fig. 1 or 3) (Knoll 2010, pp.790-793): For Japanese industry (that is, o and $\ell = J$), respectively,

$$(O) R_J^J(i_1) - R_E^J(i_2) = 0 \text{ or } R_J^J(i_1) = R_E^J(i_2) = R^J, \text{ a constant} \quad (3)$$

and

$$(L) R_J^J(i_1) - R_J^E(i_4) = 0 \text{ or } R_J^J(i_1) = R_J^E(i_4) = R_J, \text{ a constant}, \quad (4)$$

where boldfaced italic alphabet J is used simply to highlight, and differentiate between, the superscript o in (O) and the subscript ℓ in (L); for EU industry (that is, o and $\ell = E$), respectively,

$$(O) R_E^E(i_3) - R_J^E(i_4) = 0 \text{ or } R_E^E(i_3) = R_J^E(i_4) = R^E, \text{ a constant} \quad (5)$$

and

$$(L) R_E^E(i_3) - R_E^J(i_2) = 0 \text{ or } R_E^E(i_3) = R_E^J(i_2) = R_E, \text{ a constant}. \quad (6)$$

Note here that: Eqs. (3) and (1) imply that $\bar{R}_J^J = \bar{R}_E^J$; Eqs. (5) and (2) imply that $\bar{R}_J^E = \bar{R}_E^E$; and Eqs. (4), (6), (1) and (2) imply that $\bar{R}_J^J = \bar{R}_E^E$ and $\bar{R}_J^E = \bar{R}_E^J$. These equilibrium relationships based on average ROAs will be important when proposing to numerically determine competitiveness of an industry/multinationals in Subsection 4.4.

For a Japanese industry, for example, *both* equalities (3) and (4) simultaneously hold at the intersection of the thick (vertical and horizontal) lines, in Fig. 3, where there is neither efficiency advantage nor productivity advantage (as described above).

4.2 Assets at far right and left

In Fig. 3, assets along the far right [left] line are those i_1 [i_2] whose efficiency advantage from locating the assets in Japan [EU] for an ownership-based Japanese industry ($o = J$) is greatest: Largest positive [negative] $R_J^J(i_1) - R_E^J(i_2)$, in Fig. 2.

Assets at the top [bottom] are those i_1 [i_4] whose productivity advantage from Japanese [EU] ownership for a location-based Japanese industry ($\ell = J$) is greatest: Largest positive [negative] $R_J^J(i_1) - R_J^E(i_4)$, in Fig. 2.

4.3 Assets inside the quadrants

In Fig. 3, those assets such as a_J^J , b_E^J , c_E^E and d_E^E (inside the quadrants, that is, not in equilibrium) are those efficiently located and productively owned, generating advantages for the Japanese or EU industry in such a way that:³

$a_J^J(i), i = 1, \dots, n_1$ are assets efficiently located in Japan and productively Japanese-owned in the sense of, respectively, the black and white dotted inequalities in quadrant 1 exemplified in Fig. 2;⁴

$b_E^J(i), i = 1, \dots, n_2$ assets efficiently located in EU and productively Japanese-owned in the sense of, respectively, the black and white dotted inequalities in quadrant 2 exemplified in Fig. 2;⁵

³See also Subsection 4.1.

⁴To be more specific, $R_J^J > R_J^E, R_E^J, R_E^E$ (Knoll 2010, p.790). See Note 2 in the figure for omitting asset indices i_1 through i_4 , respectively, for quadrants 1 through 4 in Fig. 1 or 3.

⁵To be more specific, $R_E^J > R_J^E, R_J^J, R_E^E$.

$c_E^E(i), i = 1, \dots, n_3$ assets efficiently located in EU and productively EU-owned in the sense of, respectively, the black and white dotted inequalities in quadrant 3 exemplified in Fig. 2;⁶

$d_J^E(i), i = 1, \dots, n_4$ assets efficiently located in Japan and productively EU-owned in the sense of, respectively, the black and white dotted inequalities in quadrant 4 exemplified in Fig. 2.⁷

Those features in Fig. 3 are drawn in terms of the efficiency advantage measured by the ROA differential $R_J^o - R_E^o$ for an *ownership-based* industry and the productivity advantage measured by the ROA differential $R_\ell^J - R_\ell^E$ for a *location-based* industry in Fig. 2, whose origin corresponds to the intersection of the thick (vertical and horizontal) lines in Fig. 3. That is, as noted in Fig. 2, the large [negative] value of the ROA differential $R_J^o - R_E^o$ indicates efficiency advantage from locating the assets in Japan [in EU] and that of the ROA differential $R_\ell^J - R_\ell^E$ productivity advantage from Japanese [EU] ownership of the assets.

More specifically, referring to quadrants in Fig. 2:⁸

$R_J^o - R_E^o = 0$: No efficiency advantage from locating the assets either in Japan or EU, for *ownership-based Japanese* ($o=J$) [*EU* ($o=E$)] industry;

Quadrant 1: $R_J^J - R_E^J > 0$: Efficiency advantage from locating the assets in Japan, for ownership-based Japanese industry;

Quadrant 2: $R_J^J - R_E^J < 0$, whose absolute value: Efficiency advantage from locating the assets in EU, for ownership-based Japanese industry;

Quadrant 3: $R_J^E - R_E^E < 0$, whose absolute value: Efficiency advantage from locating the assets in EU, for ownership-based EU industry;

Quadrant 4: $R_J^E - R_E^E > 0$: Efficiency advantage from locating the assets in Japan, for ownership-based EU industry.

$R_\ell^J - R_\ell^E = 0$: No productivity advantage either from Japanese or EU ownership of the assets, for *location-based Japanese* ($\ell=J$) [*EU* ($\ell=E$)] industry;

Quadrant 1: $R_J^J - R_E^J > 0$: Productivity advantage from Japanese ownership of the assets, for location-based Japanese industry;

Quadrant 2: $R_J^J - R_E^J > 0$: Productivity advantage from Japanese ownership of the assets, for location-based EU industry;

Quadrant 3: $R_J^E - R_E^E < 0$, whose absolute value: Productivity advantage from EU ownership of the assets, for location-based EU industry;

Quadrant 4: $R_J^E - R_E^E < 0$, whose absolute value: Productivity ad-

⁶To be more specific, $R_E^E > R_J^E, R_J^J, R_E^J$.

⁷To be more specific, $R_E^E > R_J^J, R_E^J, R_E^E$.

⁸See Note 2 in the figure for asset indices i_1 through i_4 being omitted below.

vantage from EU ownership of the assets, for location-based Japanese industry.

Without any distortions such as corporate income taxes, assets not in equilibrium are (most) efficiently located (for an ownership-based industry) and (most) productively owned (for a location-based industry) inside or at far right or left of the quadrants in Fig. 3 (Knoll 2010, p.790) and in Fig. 2 (in terms of the newly proposed ROA differentials).

4.4 How to measure competitiveness and competitive advantage based on average ROAs: Simplified analytics of competitiveness of a Japanese industry

With proposed numerical measures of efficiency advantage and productivity advantage for *each* asset in Subsection 4.1.1 (respectively, $R_J^o - R_E^o$ and $R_\ell^J - R_\ell^E$, for o and $\ell = J$), we next propose to measure *competitiveness* of a Japanese industry as against a non-Japanese counterpart, by the *average* (before-tax) ROA differentials, $\bar{R}_J^J - \bar{R}_E^J$ or $\bar{R}_J^J - \bar{R}_J^E$, depending on the definition of the industry,⁹ where each average is computed by Eqs. (1) and (2).

Competitive advantage of an ownership-[location-]based Japanese industry is, thus, measured by efficiency advantage (the positive ROA differential, $\bar{R}_J^J - \bar{R}_E^J$) [by productivity advantage (the positive ROA differential, $\bar{R}_J^J - \bar{R}_J^E$)].

Drawn for average (before-tax and after-tax) ROA differentials is Fig. 4 which is simply Fig. 2 with bars added and “Greatest for ...” deleted.

Recall from Subsection 3.1.1 that, with our metric of tax-based competitiveness (of a Japanese industry), the Japanese industry/multinationals will be more or less competitive even if there are present no corporate taxes or equal taxes across countries, under which the Japanese industry/multinationals and the non-Japanese industry/multinationals will still differ in the (before-tax) ROA for asset due to differing *non-tax* production costs.

⁹See Subsection 3.2.2.

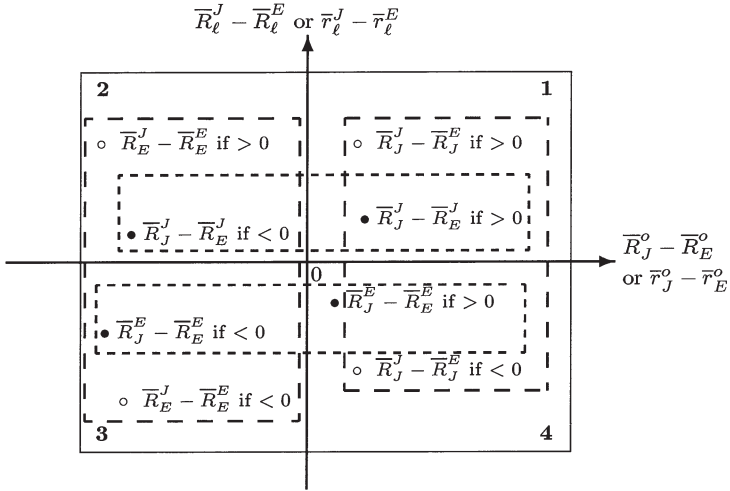


Figure 4 Average ROA Differentials Measuring Efficiency Advantage with respect to Location, for an Ownership-based Industry (Horizontal Axis) and Productivity Advantage with respect to Ownership, for a Location-based Industry (Vertical Axis). Note 1: This is simply Fig. 2 with bars added and “Greatest for ...” deleted. Note 2: ROA *averages* in each quadrant are computed by Eqs. (1) and (2); the (*black dotted*) ROA differentials inside the *horizontally* dashed boxes for the Japanese industry/multinationals defined horizontally based on *ownership* and those (*white dotted*) differentials inside the *vertically* dashed boxes for the Japanese industry/multinationals defined vertically based on *location* will be used in Eqs. (7) and (8).

Thus, under no taxation that may induce distortions of location and/or ownership, as drawn in Figs. 2 through 4, together with the two definitions of a Japanese industry in Subsection 3.2, the Japanese industry/multinationals defined based

- i.* horizontally on **ownership** or *ii.* vertically on **location**

will be $\left\{ \begin{array}{c} \text{more} \\ \text{equally} \\ \text{less} \end{array} \right\}$ competitive than/with the EU counterpart(s),

as

i. the absolute value of the average ROA differentials measuring “efficiency advantage from locating assets in Japan or EU”

$$\left| \bar{R}_J^J - \bar{R}_E^J \right| \left\{ \begin{array}{l} > \\ = \\ < \end{array} \right\} \left| \bar{R}_J^E - \bar{R}_E^E \right| \quad (7)$$

or

ii. the absolute value of the average ROA differentials measuring “productivity advantage from Japanese or EU ownership of the assets”

$$\left| \bar{R}_J^J - \bar{R}_J^E \right| \left\{ \begin{array}{l} > \\ = \\ < \end{array} \right\} \left| \bar{R}_E^J - \bar{R}_E^E \right|, \quad (8)$$

where the average ROA differentials as such are computed by Eqs. (1) and (2), and are exemplified in Fig. 4 as the *black* dotted ROA differentials ($\bar{R}_J^J - \bar{R}_E^J$, etc.) inside the *horizontally* dashed boxes for the Japanese industry/multinationals defined horizontally based on *ownership* and those *white* dotted differentials ($\bar{R}_J^J - \bar{R}_J^E$, etc.) inside the *vertically* dashed boxes for the Japanese industry/multinationals defined vertically based on *location*.

Notice the equalities above hold in equilibrium (that is, for equilibrium pairs of location and ownership of the assets), in particular, as is readily clear from (the paragraph right below Eq. (6) in) Subsection 4.1: In equilibrium either ownership-based Japanese industry or location-based Japanese industry will be *equally* competitive with the similarly defined EU industry.

5 A Geometry and Simplified Analytics with Corporate Taxation-induced Distortions: Tax-induced Effect on Equilibrium and Competitiveness

How home (Japanese) corporate taxation affects competitiveness of a home (Japanese) industry is studied for the ownership- and location-based definitions of the industry in Subsections 3.1 and 4.4.

No corporate taxes or equal taxes across countries are assumed there and, thus, actual systems of cross-border/international corporate taxation are entirely ignored, however. Two such alternative systems are now introduced here in the present section to study their effects on the Japanese industry's competitiveness.

5.1 Two alternative international corporate tax systems: Worldwide taxation vs. territorial taxation

An international tax system consists of cross-border income tax arrangements, of which we will focus in particular on a system of worldwide corporate taxation and a territorial system.¹⁰

The two systems are summarized in Tables 2 and 3 in Appendix C; in the latter table, EU and Japan are, respectively, a (host, that is, source) country where a foreign income was earned by a Japanese industry/multinational firms and a (Japanese industry's/multinational firms' home) country where the income will be (possibly eventually) repatriated.

5.2 Under worldwide tax system: Japan prior to the 2009 tradition to the territorial system

How will the corporate income tax distort or shift the equilibrium pair of ownership and location of the assets? The question will be studied

¹⁰For the effects of the move from worldwide taxation to territoriality, see Matheson, et al. (2013) studying what would be implied, for low-income countries, by the transition with regard to their ability to generate tax revenues from profits on their inbound FDI.

from two viewpoints: (a) A consequence of competitiveness of an industry (Knoll 2010, pp.777-793), as summarized in Subsections 3.1.2 and 3.2.1, and (b) competitiveness measured directly by the after-tax ROA differentials as newly proposed in Subsections 3.1.1 and 3.2.2. Mainly relying on Knoll (2010), (a) is studied in Appendix B.

Let t_J denote the Japanese corporate tax rate. It is assumed for simplifying purposes that the EU corporate tax rate is zero: $t_E = 0$.

5.2.1 Taxation-induced distortions of location

a. A consequence of competitiveness of an industry: A geometry See Subseciton B.1 in Appendix B: Fig. 5 there applies.

b. Tax-based competitiveness of a Japanese industry, in the ownership- and location-based definitions: Simplified analytics

Let $r_\ell^o(i)$ denote the *after-tax* return on investment in asset (ROA) i which is located in country ℓ and owned by a country o 's industry.

With $t_E = 0$, t_J^a and t_J^p denoting Japanese corporate taxes, respectively, on active and passive incomes earned in EU and $R_E^J = R_E^{aJ} + R_E^{pJ}$,¹¹ and for pure worldwide Japan (with neither FTCs nor deferral):¹²

$$r_J^J(i) = R_J^J(i)(1 - t_J); \quad (9)$$

$$r_E^J(i) = R_E^J(i)(1 - t_E) - R_E^{aJ}(i)t_J^a - R_E^{pJ}(i)t_J^p \text{ [double taxation, on each of active and passive incomes from EU];} \quad (10)$$

$$r_E^E(i) = R_E^E(i)(1 - t_E); \quad (11)$$

$$r_J^E(i) = \begin{cases} R_J^E(i)(1 - t_J - t_E) \text{ [for pure worldwide EU];} \\ R_J^E(i)(1 - t_J) \text{ [for pure territorial EU].} \end{cases} \quad (12)$$

For hybrid worldwide Japan (with FTCs and deferral):¹³ All equations but Eq. (10) will apply; Eq. (10) is rewritten as

¹¹If written in weighted-average form, $R_E^J = \alpha R_E^{aJ} + (1 - \alpha)R_E^{pJ}$ with $\alpha = \frac{\text{active income}}{\text{active income} + \text{passive income}}$.

¹²See Table 2 for a pure worldwide tax system in Appendix C. See footnote 83 in Knoll (2010, p.793) for Eq. (10) below.

¹³See Table 3 for a hybrid tax system (of pure worldwide and territorial systems) in Appendix C.

$$r_E^J(i) = R_E^J(i)(1 - t_E) - R_E^{PJ}(i)t_J^P \text{ [no double taxation on active income unless repatriated, but double taxation on passive income].} \quad (13)$$

The hybrid nature here is found in Eq. (13) which is (almost) the same as Eq. (26) in Subsection 5.3: Recall from Table 1 in Appendix B that “a worldwide system with deferral can fairly mimic a territorial regime. ...”

And the space (simple, cross-sectional) average after-tax ROAs are computed for Fig. 5 in Appendix B as follows: For *quadrants 1 and 2*, respectively,¹⁴

$$\bar{r}_J^J = \frac{1}{n_1 - \Delta n_{LJ}} \sum_i r_J^J(i) \text{ and } \bar{r}_E^J = \frac{1}{n_2 + \Delta n_{LJ}} \sum_i r_E^J(i); \quad (14)$$

for *quadrants 3 and 4*, respectively,

$$\bar{r}_E^E = \frac{1}{n_3 + \Delta n_{LE}} \sum_i r_E^E(i) \text{ and } \bar{r}_J^E = \frac{1}{n_4 - \Delta n_{LE}} \sum_i r_J^E(i) \quad (15)$$

where (positive) Δn_{LJ} and Δn_{LE} denote the number of assets increased (that is, included, respectively, in the regions LJ and LE) due to the Japanese corporate tax, as drawn in Fig. 5.

Recall here from the very first footnote in Subsection 3.1.1, together with Subsection 3.1.2, that the two incremental changes above are being considered in the present paper a consequence of competitiveness (as studied in Appendix B).¹⁵ And yet they are included in the computations of the average after-tax ROAs, whose differentials as applied in Eqs. (16) and (17) below are a direct measure of competitiveness. There will be, thus, the following causal relation: We may interpret “the number of assets increased possibly due to the Japanese corporate tax (in the *after-tax* environment)” as “the possible result of higher competitiveness measured directly, for example, in terms of the (average) *before-tax* ROA differentials (formally presented as Eqs. (7) and (8) in Subsection 4.4).” Then, there will occur further changes in the number

¹⁴See Eqs. (1) and (2) for average before-tax ROAs.

¹⁵That is, we differ in approach from Knoll (2010) who measures the degree of tax-based competitiveness in terms of the incremental number of assets as such: The present paper measures tax-based competitiveness in terms of its direct measure, that is, average after-tax ROA differentials (see Subsection 3.1.1).

of assets as such, if tax-based competitiveness turns out better, in the latest *after-tax* environment, in terms of Eqs. (16) and (17) where the (average) after-tax ROA differentials are computed using the currently available, incremental number of assets as such in Eqs. (14) and (15).

Relevant here is how home (Japanese) corporate taxation affects competitiveness of a home (Japanese) industry, as briefly summarized for the ownership- and location-based definitions of the industry in Subsections 3.1.1 and 3.2.2. Being measured as newly proposed in these two subsections, competitiveness of a Japanese industry depends on how the industry is defined (see Knoll 2010 cited in Subsection 3.2). With taxation-induced distortions of location as drawn in Fig. 5, thus, the Japanese industry/multinationals defined based

i. horizontally on **ownership**

 or ii. vertically on **location**

will be $\left\{ \begin{array}{c} \text{more} \\ \text{equally} \\ \text{less} \end{array} \right\}$ competitive than/with the EU counterpart(s),

as

i. the absolute value of the average ROA differentials measuring “efficiency advantage from locating assets in Japan or EU”

$$|\bar{r}_J^J - \bar{r}_E^J| \left\{ \begin{array}{c} > \\ = \\ < \end{array} \right\} |\bar{r}_J^E - \bar{r}_E^E| \quad (16)$$

or

ii. the absolute value of the average ROA differentials measuring “productivity advantage from Japanese or EU ownership of the assets”

$$|\bar{r}_J^J - \bar{r}_J^E| \left\{ \begin{array}{c} > \\ = \\ < \end{array} \right\} |\bar{r}_E^J - \bar{r}_E^E|, \quad (17)$$

where the average ROA differentials here are exemplified in Fig. 4 in Subsection 4.4, with \bar{R}_ℓ^o replaced by \bar{r}_ℓ^o , as the black and white dotted ROA differentials.

Notice the equalities above hold in equilibrium (that is, for equilibrium pairs of location and ownership of the assets), in particular, as is readily clear from the last paragraph in Subsection B.1 in Appendix B: In equilibrium either ownership-based Japanese industry or location-based Japanese industry will be equally competitive with the similarly defined EU industry.¹⁶

5.2.2 Taxation-induced distortions of ownership

a. A consequence of competitiveness of an industry: A geometry See Subsection B.2 in Appendix B: Fig. 6 there applies.

b. Tax-based competitiveness of a Japanese industry, in the ownership- and location-based definitions: Simplified analytics

With $t_E = 0$ and for pure worldwide Japan and hybrid worldwide Japan, again, Eqs. (9) through (13) in Subsection 5.2.1.b apply here, too. And the average after-tax ROAs are computed for Fig. 6 in Appendix B as follows: For *quadrants 1 and 2*, respectively,

$$\bar{r}_J^J = \frac{1}{n_1} \sum_i r_J^J(i) \text{ and } \bar{r}_E^J = \frac{1}{n_2 - \Delta n_O} \sum_i r_E^J(i); \quad (18)$$

for *quadrants 3 and 4*, respectively,

$$\bar{r}_E^E = \frac{1}{n_3 + \Delta n_O} \sum_i r_E^E(i) \text{ and } \bar{r}_J^E = \frac{1}{n_4} \sum_i r_J^E(i) \quad (19)$$

where (positive) Δn_O denotes the number of assets increased (included in the regions O) due to the Japanese corporate tax, as drawn in Fig. 6. For how the incremental change here is interpreted in the present paper, see Subsection 5.2.1.b.

Relevant here is again how home (Japanese) corporate taxation affects competitiveness of a home (Japanese) industry, as briefly summarized in Subsections 3.1.1 and 3.2.2. Again, competitiveness of a Japanese industry depends on how the industry is defined. With taxation-induced distortions of ownership as drawn in Fig. 6 for which the average after-tax ROAs \bar{r}_ℓ^o (o and $\ell = J, E$) are newly computed as immediately above, Eqs. (16) and (17) apply here.

Notice, again, the equalities in the two equations hold in equilibrium (that is, for equilibrium pairs of location and ownership of the assets),

¹⁶For a similar equilibrium feature for no-tax case, see Subsection 4.4.

in particular, as is readily clear from the last paragraph in Subsection B.2 in Appendix B.

5.2.3 Taxation-induced distortions of both location and ownership

a. A consequence of competitiveness of an industry: A geometry See Subsection B.3 in Appendix B: Fig. 7 there applies.

b. Tax-based competitiveness of a Japanese industry, in the ownership- and location-based definitions: Simplified analytics With $t_E = 0$ and for pure worldwide Japan and hybrid worldwide Japan, again, Eqs. (9) through (13) in Subsection 5.2.1.b apply here.

The average after-tax ROAs are computed for Fig. 7 in Appendix B as follows: For *quadrants 1 and 2*, respectively,

$$\bar{r}_J^J = \frac{1}{n_1 - \Delta n_A - \Delta n_B} \sum_i r_J^J(i) \text{ and } \bar{r}_E^J = \frac{1}{n_2 + \Delta n_A - \Delta n_D} \sum_i r_E^J(i); \quad (20)$$

for *quadrants 3 and 4*, respectively,

$$\bar{r}_E^E = \frac{1}{n_3 + \Delta n_B + \Delta n_C + \Delta n_D} \sum_i r_E^E(i) \text{ and } \bar{r}_J^E = \frac{1}{n_4 - \Delta n_C} \sum_i r_J^E(i). \quad (21)$$

For how the incremental changes here are interpreted in the present paper, see Subsection 5.2.1.b.

With taxation-induced distortions both of location and ownership as drawn in Fig. 7 (separately drawn in Figs. 5 and 6) for which the average after-tax ROAs \bar{r}_ℓ^o (o and $\ell = J, E$) are newly computed as immediately above, Eqs. (16) and (17) apply here again.

Again, notice the equalities in the two equations hold in equilibrium (that is, for equilibrium pairs of location and ownership of the assets), in particular, as is readily clear from the last paragraphs in Subsections B.1 and B.2 in Appendix B.

5.3 Under territorial tax system: Post-transition Japan

Table 3 in Appendix C summarizes the Japanese territorial tax system in the years following the April 2009 transition (as well as the worldwide taxation prior to the transition).

5.3.1 Taxation-induced distortions of location

a. A consequence of competitiveness of an industry: A geometry As explained in Subsection B.1, Fig. 5 applies here.

b. Tax-based competitiveness of a Japanese industry, in the ownership- and location-based definitions: Simplified analytics With $t_E = 0$ and for pure territorial Japan (with neither FTCs nor deferral being allowed):¹⁷

$$r_J^J(i) = R_J^J(i)(1 - t_J); \quad (22)$$

$$r_E^J(i) = R_E^J(i)(1 - t_E) \text{ [no double taxation]}; \quad (23)$$

$$r_E^E(i) = R_E^E(i)(1 - t_E); \quad (24)$$

$$r_J^E(i) = \begin{cases} R_J^E(i)(1 - t_J - t_E) \text{ [for pure worldwide EU]}; \\ R_J^E(i)(1 - t_J) \text{ [for pure territorial EU]}. \end{cases} \quad (25)$$

For hybrid territorial Japan (with FTCs but no deferral):¹⁸ All equations but Eq. (23) will apply; Eq. (23) is rewritten as

$$r_E^J(i) = R_E^J(i)(1 - t_E) - R_E^{\alpha(5\%)J}(i)t_J^\alpha - R_E^{pJ}(i)t_J^p \text{ [no double taxation on 95\% of active income whether or not repatriated, but double taxation on the remaining 5\% of active income if repatriated and on all passive foreign-source income]}. \quad (26)$$

The hybrid nature here is found in Eq. (26), which is slightly different from Eq. (10) for the pure worldwide system in Subsection 5.2.1.b, that “no double taxation on 95% of active income whether or not repatriated” corresponds to (pure) territoriality, while “taxation on the remaining 5% of active income if repatriated and on all passive foreign-source income” both correspond to worldwide system.

Notice that if there is no double taxation on 100% of active income, then Eq. (13) for the hybrid worldwide system in Subsection 5.2.1.b will apply. See footnote *g* in Table 3 in Appendix C.

With the average after-tax ROAs \bar{r}_ℓ^o (o and $\ell = J, E$) newly computed by Eqs. (14) and (15), tax-based competitiveness as specified by Eqs. (16) and (17) there thus applies here, too.

¹⁷See Table 2 for a pure territorial tax system.

¹⁸See Table 3 for a hybrid tax system (of pure worldwide and territorial systems).

5.3.2 Taxation-induced distortions of ownership

a. A consequence of competitiveness of an industry: A geometry As explained in Subsection B.2, Fig. 3 (*not* Fig. 6) applies here.

b. Tax-based competitiveness of a Japanese industry, in the ownership- and location-based definitions: Simplified analytics

Thus, tax-based competitiveness as specified by Eqs. (16) and (17) in Subsection 5.2.1.b applies here, too, with \bar{r}_ℓ^o (o and $\ell = J, E$) computed by Eqs. (18) and (19) with $\Delta n_O = 0$ in Subsection 5.2.2.b, for Eqs. (22) through (26) above.

5.3.3 Taxation-induced distortions of both location and ownership

As is clear from Subsections 5.3.1 and 5.3.2, Fig. 5 (*not* Fig. 7) and thus tax-based competitiveness (as specified by Eqs. (16) and (17)) in Subsection 5.2.1.b apply here again, with the average after-tax ROAs \bar{r}_ℓ^o (o and $\ell = J, E$) computed by Eqs. (14) and (15) in Subsection 5.2.1.b, for Eqs. (22) through (26) above.

6 Concluding Remarks

Associated with the two alternative definitions of Japanese industry/multinationals (that is, ownership-based and location-based definitions) are efficiency advantage from locating the assets in Japan [a foreign country] for an ownership-based Japanese industry and productivity advantage from Japanese [foreign] ownership of the assets for a location-based Japanese industry (Knoll 2010). The paper thus proposes to numerically measure the two types of efficiency, respectively, by the average after-tax ROA differentials, $\bar{r}_J^o - \bar{r}_E^o$ and $\bar{r}_\ell^J - \bar{r}_\ell^E$ (for o and $\ell = J, E$), where \bar{r}_ℓ^o s are simple averages of after-tax ROAs, r_ℓ^o s, and proposes their geometry drawn as in Figs. 2 and 4.

Tax-based competitiveness of Japanese industry/multinational firms depends on the definition of the industry (Knoll 2010), and the present paper studies and formally shows how it does, based on the average ROA differentials above, under each of the two alternative cross-border/international corporate tax systems (see, in particular, Subsections 5.2.3.b and 5.3.3

for the case of taxation-induced distortions of both location and ownership).¹⁹

Assuming a simplified two-country (Japan-EU) world, the paper shows that tax-based competitiveness as specified by Eqs. (16) and (17) in Subsection 5.2.1.b applies to all three cases (of taxation-induced distortion of location, taxation-induced distortion of ownership, and taxation-induced distortions of both location and ownership) under either international corporate taxation, with r_{ℓ}^o s and \bar{r}_{ℓ}^o s being computed as in Subsections 5.2.1.b through 5.3.3.

It is also shown that in equilibrium (that is, for equilibrium pairs of location and ownership of the assets), either ownership-based Japanese industry or location-based Japanese industry will be equally competitive with the similarly defined EU industry.

What remains is an empirical research attempting to investigate tax-based competitiveness of the Japanese industry/multinationals prior to the 2009 transition to the territorial system and in the post-transition period. The impact of the transition in Japan is studied focusing on investor valuation and profit repatriation, respectively, by Badley, et al. (2014) and Hasegawa, et al. (2015); their findings should be insightful for my future empirical research.

Appendices

A Two Definitions of a Japanese Industry and Its Tax-based Competitiveness: Knoll's (2010) Approach

This appendix summarizes Knoll's (2010) two definitions of an industry and its tax-based competitiveness and applies them to Japanese industry.

¹⁹Recall that Knoll (2010) measures the tax-based competitiveness by the number of assets (owned or located domestically and/or overseas) increased or decreased as a result of international corporate taxation, whereas the present paper considers the number of assets as such a consequence of competitiveness and, instead, the average after-tax ROA differentials a direct measure of the competitiveness. (See Section 3.)

A.1 Ownership-based definition: Horizontal quadrants 1 and 2 in Fig. 1 in Section 3

A Japanese industry is defined as a total, global production *only* by its Japanese firms, *both* in and outside Japan: What matters is the ownership only by Japanese firms, not the location; that is, focused on is the nationality (that is, Japan) of the corporation that sells its product (in other words, who/which nationality owns the product/plant producing the product), not where the product is produced/the plant is located (Knoll 2010, p.777).

The Japanese industry as such (to be called an *ownership-based industry*) is represented by those assets *owned* by its Japanese firms (for example, a_J^o and b_{NJ}^o , $o = J$), included in *horizontal quadrants 1 and 2* in Fig. 1. Notice, in quadrants 1 and 2, the same superscript $o = J$ denoting who owns the assets (together with different location-subscripts J and NJ).

The ownership-based definition is the one widely used.²⁰

A.1.1 A consequence of competitiveness of an industry, in the ownership-based definition

The competition between Japanese and non-Japanese multinationals can be visualized as competition to acquire control over productive assets located in different locations; under this view, for example, the various national (that is, Japanese and non-Japanese) auto industries compete to own an auto plant in Canada (Knoll 2010, p.777).

Based on the ownership-based definition here, the Japanese industry which is more competitive (in the sense given in Subsection 3.1.2) than its foreign rivals (outside Japan) will (eventually or as a consequence of competitiveness)²¹ *acquire* the asset(s), such as b_{NJ}^J , *outside* Japan, in *quadrant 2* (Knoll 2010, p.777).²²

See also Appendix B.

²⁰With corporate income tax-induced distortions Kojima (2016), in effect, relies on the ownership-based definition of the Japanese industry/multinationals.

²¹See the very first footnote in Subsection 3.1.1.

²²The ownership-based type of competitiveness of the Japanese industry/multinationals here is closely related to Kojima (2016), the panel data econometric research on the effect of corporate taxation on the location choice of Japanese multinationals.

A.1.2 Tax-based competitiveness: How corporate taxation affects competitiveness of an industry, in the ownership-based definition

Under our approach explained in Subsection 3.1.1, corporate taxation will eventually affect the number of assets owned by an industry, which is taken to be a consequence of the industry's competitiveness measured directly using the after-tax ROA in the present paper. Recall, however, that Knoll (2010) uses the ownership of productive assets as a direct measure of an industry's competitiveness, as quoted below:

“Taxation, then, affects competitiveness through its (eventual) impact on the ownership of productive assets. Thus, the U.S. [Japanese] corporate income tax will adversely affect the competitiveness of the U.S. [Japanese] automotive industry if it reduces the incentive for the Big 3 [Japanese automakers]—relative to their foreign competitors—to own automobile-producing assets. If the corporate income tax discourages U.S. [Japanese] firms from owning automotive assets, then the corporate income tax directly reduces the competitiveness of the U.S. [Japanese] auto industry; otherwise, it does not.” (Knoll 2010, pp.777-778) in which [Japanese] and [Japanese automakers] inserted apply to the present paper.

A.2 Location-based definition: Vertical quadrants 1 and 4 in Fig. 1 in Section 3

A Japanese industry is defined as a total production *both* by its Japanese firms and the corresponding (that is, the same industry's) non-Japanese firms, *only in* Japan: What matters is the location only in Japan, not the ownership; that is, focused on is the production within Japan without regard to the nationality of the producing firms (Knoll 2010, p.778).

The Japanese industry as such (to be called a *location-based industry*) is represented by those assets *located in* Japan (owned by its Japanese firms *and* the non-Japanese firms, for example, a_ℓ^J and d_ℓ^{NJ} , $\ell = J$), included in *vertical quadrants 1 and 4* in Fig. 1. Notice, in quadrants 1 and 4, the same subscript $\ell = J$ denoting where the assets are located (together with different ownership-superscripts J and NJ).

A.2.1 A consequence of competitiveness of an industry in the location-based definition

Viewed from the perspective above, the competition that takes place between the U.S., German, and Japanese auto industries takes the form of competition to produce more cars within each country. Because auto production is a highly capital-intensive activity, that competition takes the form of competing to attract capital (Knoll 2010, p.778).

Defined (vertically) as such, the Japanese industry which is more competitive (in the sense given in Subsection 3.1.2) than its foreign rivals (outside Japan) will (eventually or as a consequence of competitiveness)²³ attract more assets (for example, more manufacturing plants) such as non-Japanese-owned asset d_j^{NJ} located in Japan, in quadrant 4 (Knoll 2010, p.778).

See also Appendix B.

A.2.2 Tax-based competitiveness: How corporate taxation affects competitiveness of an industry, in the location-based definition

Under our approach explained at the outset in Subsection 3.1.1, corporate taxation will eventually affect the investment/production (that is, domestic DI and inbound FDI) in Japan, which is taken to be a consequence of the industry's competitiveness measured directly using the after-tax ROA. Recall, however, that Knoll (2010) uses the investment/production in Japan as a direct measure of an industry's competitiveness, as quoted below:

“The corporate income tax, then, affects competition through its impact on investment in auto production in different countries. Thus, the U.S. [Japanese] corporate income tax reduces the competitiveness of the U.S. [Japanese] automobile industry if it discourages investment in automobile production in the United States [Japan] relative to investment in such production abroad. If the U.S. [Japanese] corporate income tax discourages production in the United States [Japan], then it directly reduces the competitiveness of the U.S. [Japanese] auto industry; otherwise, it does not.” (Knoll 2010, p.778) in which [Japanese] and [Japan] inserted apply to the present paper.

²³See the very first footnote in Subsection 3.1.1.

B A Consequence of Competitiveness of an Industry with Tax-induced Distortions: Knoll’s (2010) Geometry

Relying, again, primarily on Knoll (2010), the present appendix studies “a. A consequence of competitiveness of an industry: A geometry” for the worldwide tax system in Subsections 5.2.1, 5.2.2 and 5.2.3. (See also Subsections A.2.1 and A.1.1 in Appendix A.)

B.1 Taxation-induced distortions of location (for Subsection 5.2.1)

Referring to territoriality as well, Table 1 summarizes Figs. 5 through 7 drawn below in the present appendix, to show how location and ownership (that is, consequences of competitiveness) will be distorted by Japanese corporate taxation (being higher relative to EU tax) under the (pure and hybrid versions of) worldwide tax system in Japan (prior to the 2009 tradition to the territoriality). The upper panel “Location distortion (Subsection B.1)” of the table is readily seen to be consistent with the following remarks.

As may be readily inferred from footnote *q* (especially, Matheson, et al. 2013, pp.7-8 and McIntyre 2011, pp.1-2, quoted there) in Table 3 in Appendix C, Fig. 5 applies to the case assuming the territorial tax system as well (Knoll 2010, p.785, 787-788). That is, whether the international tax system is worldwide or territorial, Fig. 5 applies, showing that the higher the Japanese corporate tax rate, the larger the distortion given by the area of the rectangle with the thick and new thin (vertical) lines: Two quadrants 2 and 3 are rightward widened, with the remaining quadrants 1 and 4 contracted. Either under the worldwide or territorial tax system, location (of the assets) depends on the magnitude of *relative* tax rate of Japan to EU; no location distortions (that is, no shift of the thick vertical line) would occur if the tax rates are the same across countries.²⁴

Let $r_\ell^o(i)$ denote the *after-tax* ROA (in asset *i*) which is located in country ℓ and owned by a country *o*’s industry.

²⁴Location distortions as such is empirically studied by Kojima (2016), the panel data econometric research on the effect of corporate taxation on the location choice of Japanese multinationals.

Then, with $t_E = 0$, in equilibrium with taxation-induced distortions of location (that is, along the new thin vertical line in Fig. 5, for $o = J, E$), $r_J^o = r_E^o [= R_E^o(1 - t_E - t_J)]^{25}$ where $r_J^o = R_J^o(1 - t_J)$, the after-tax ROAs for assets located in Japan (Knoll 2010, p.791).

Table 1 How Location and Ownership Will Be Distorted by Japanese Corporate Taxation (Higher Relative to EU Tax), under the Worldwide Tax System in Japan^a

| | |
|--|---|
| Location and ownership distortions as drawn in Figs. 5 through 7 ^b | What is meant for the Japanese industry in Japan |
| Location distortion (Subsection B.1): Figs. 5 and 7: $\Delta n_{LJ}; \Delta n_A, \Delta n_B$ | More outbound FDI in EU, along with less domestic DI ^c |
| $\Delta n_{LE}; \Delta n_C$ | Less inbound FDI ^d |
| Ownership distortion (Subsection B.2): Figs. 6 and 7: $\Delta n_O; \Delta n_B, \Delta n_D$ | Less outbound FDI along with no change in domestic DI or in inbound FDI (but with EU's more domestic DI) ^e |

Footnotes to Table 1:

^aEU tax is assumed zero in Section 5. For the (hypothetical) pure and (actual) hybrid worldwide systems see, respectively, Tables 2 and 3 in Appendix C.

^bAll Δ s are assumed non-negative.

^cJapanese corporate taxation higher relative to EU tax will likely discourage Japanese firms from headquartering in Japan, motivating them to invest more (that is, locate more assets) in EU, a lower-tax jurisdiction, that is, encouraging them to incorporate in EU (see footnote *e*).

This applies to the territorial system as well, for location (of the assets) depends on the magnitude of *relative* tax rate of Japan to EU, irrespective of the international tax system in Japan: The higher the Japanese corporate tax rate, the larger the distortion given by the area of *LJ* (that is, Δn_{LJ}); no location distortions would occur (that is, $\Delta n_{LJ} = 0$) if the tax rates are the same across countries. See the second paragraph in the current Subsection B.1.

^dJapanese corporate taxation higher relative to EU tax will most likely deter EU firms from headquartering in Japan, motivating them to invest more (that is, locate more assets) in EU.

This applies to the territorial system as well, for the reason given in the preceding footnote.

^eThe (pure) worldwide taxation will subject Japanese firms to tax on both income earned in Japan (home) and EU (abroad), motivating the Japanese firms to avoid

²⁵See Subsection 5.2.1.b.

B.2 Taxation-induced distortions of ownership (for Subsection 5.2.2)

Recall that Table 1 summarizes Fig. 5 through 7, showing how location and ownership (that is, consequences of competitiveness) will be distorted by Japanese corporate taxation (being higher relative to EU tax) under the (pure and hybrid versions of) worldwide tax system in Japan (prior to the 2009 transition to the territoriality). The lower panel “Ownership distortion (Subsection B.2)” of the table is readily seen to be consistent with the following remarks.

As drawn in Fig. 6, the taxation-induced migration from Japanese ownership to EU ownership occurs in EU, *not* in Japan: Quadrant 3 only is (upward) widened, with quadrant 4 remaining *unchanged*. Knoll (2010, pp.792-793) argues that “one effect of the United States [Japan] enacting a corporate income tax, assuming that the tax is assessed on a worldwide basis, is to impose a toll charge on U.S. [Japanese] companies that invest abroad. In the example, the toll charge will raise the hurdle rate for investments by U.S. [Japanese] corporations in the European Union. That, in turn, will bring about a shift from U.S. [Japanese] to EU ownership of those investments where the productivity advantage from U.S. [Japanese] ownership is insufficient to compensate for the higher hurdle rate brought about by the corporate income tax. ... (T)he higher the U.S. [Japanese] tax rate, the greater the migration.” with a footnote that “Tightening worldwide taxation (for example, by reducing the opportunity for deferral)²⁶ discourages U.S. [Japanese] corporations from holding overseas assets by raising the toll charge on investments through U.S. [Japanese] companies.” (where [Japan] and [Japanese] inserted apply to the present paper).

The migration as such applies only to the case assuming the worldwide tax system: It can be prevented under the territorial tax system in Japan without reducing the Japan’s corporate tax rate, as Knoll (2010, p.793) argues that “If the United States were to adopt territorial taxation, then EU-based and U.S.-based firms would pay the same tax (assumed to be zero in the example) when they invested in the European Union. There would be, then, no toll charge on overseas corporate investment” (by U.S. corporations).

In equilibrium with taxation-induced distortions of ownership, there

²⁶See Table 2 for pure worldwide taxation, which is equivalent to the worldwide system being most tightened.

concurrently exist two equilibria in Fig. 6: Along the new thin horizontal line (that is, for $\ell = E$), $r_\ell^J = r_\ell^E [= R_\ell^E(1 - t_E - t_J)]^{27}$ where $r_\ell^J = R_\ell^J(1 - t_J)$, the after-tax ROAs for assets owned by Japanese industry (Knoll 2010, pp.792-793); along the old thick horizontal line to the right of the thick vertical line (that is, for $\ell = J$), $r_\ell^J = R_\ell^J, r_\ell^E = R_\ell^E$ with $r_\ell^J = r_\ell^E$ (Knoll 2010, p.789).

| | | |
|--|---|---|
| Outbound FDI 2 $b_E^J(i)$ $R_E^J(i)$ $n_2 \rightarrow n_2 - \Delta n_O$ | Domestic DI 1 $a_J^J(i)$ $R_J^J(i)$ n_1 (Unchanged) | Assets Productively Owned (Investment/Production) By Japanese Firms/Industry <i>[Ownership-based definition of a Japanese Industry: Quadrants 1 and 2]</i> |
| $O \quad \Delta n_O \quad \uparrow$ | | |
| 3 $c_E^E(i)$ $R_E^E(i)$ $n_3 \rightarrow n_3 + \Delta n_O$ | Inbound FDI 4 $d_J^E(i)$ $R_J^E(i)$ n_4 (Unchanged) | Assets Productively Owned (Investment/Production) By EU Firms/Industry |
| Assets Efficiently Located (Investment/Production) In EU | Assets Efficiently Located (Investment/Production) In Japan <i>[Location-based definition of a Japanese Industry: Quadrants 1 and 4]</i> | |

Figure 6 Equilibrium Pairs of Location and Ownership for the Japanese Industry, with Ownership Distortion Induced by Tax. Note 1: See Notes in Fig. 3. Note 2: Δn_O is positively valued.

B.3 Taxation-induced distortions of both location and ownership (for Subsection 5.2.3)

With taxation-induced distortions of both location and ownership, Fig. 7 draws the combined distortions in both Figs. 5 and 6: Two quad-

²⁷See Subsection 5.2.1.b.

rants 2 and 3 are rightward widened, with quadrants 1 and 4 contracted and quadrant 3 only is upward widened, while quadrant 4 *not* upward widened.

Equilibrium features here for distortions of both location and ownership are those summarized in the last paragraphs in Subsections B.1 and B.2.

| | | | |
|--|--|---|---|
| <p>Outbound FDI 2</p> <p>$b_E^J(i)$ $R_E^J(i)$ $n_2 \rightarrow n_2 + \Delta n_A - \Delta n_D$</p> | <p><i>A</i></p> <p>Δn_A</p> <p>\rightarrow</p> | <p>Domestic DI 1</p> <p>$a_J^J(i)$ $R_J^J(i)$ $n_1 \rightarrow n_1 - \Delta n_A - \Delta n_B$</p> | <p>Assets Productively Owned (Investment/Production) By Japanese Firms/Industry <i>[Ownership-based definition of a Japanese Industry: Quadrants 1 and 2]</i></p> |
| <p><i>D</i> Δn_D \uparrow</p> | <p>\rightarrow $\uparrow \Delta n_B$</p> | | |
| <p>3</p> <p>$c_E^E(i)$ $R_E^E(i)$ $n_3 \rightarrow n_3 + \Delta n_B + \Delta n_C + \Delta n_D$</p> | <p><i>C</i></p> <p>Δn_C</p> <p>\rightarrow</p> | <p>Inbound FDI 4</p> <p>$d_J^E(i)$ $R_J^E(i)$ $n_4 \rightarrow n_4 - \Delta n_C$</p> | <p>Assets Productively Owned (Investment/Production) By EU Firms/Industry</p> |
| <p>Assets Efficiently Located (Investment/Production) In EU</p> | | <p>Assets Efficiently Located (Investment/Production) In Japan <i>[Location-based definition of a Japanese Industry: Quadrants 1 and 4]</i></p> | |

Figure 7 Equilibrium Pairs of Location and Ownership for the Japanese Industry, with Location and Ownership Distortions Both Induced by Tax. Note 1: See Notes in Fig. 3. Note 2: The italic letters *A*, *B*, *C* and *D* are those as defined and used in Knoll’s (2010, p.789) Figure 2; their respective numbers of assets contained are (positively-valued) Δn_A , Δn_B , Δn_C and Δn_D .

C Two Alternative Systems of International Corporate Taxation: Worldwide Taxation vs. Territoriality

Two alternative cross-border/international taxations are summarized for pure and hybrid (actual) systems, respectively, in Tables 2 and 3; in the latter table, just as in Sections 4 and 5, EU and Japan are, respectively, a (host, that is, source) country where a foreign income was earned by a Japanese industry/multinational firms and a (Japanese industry's/multinational firms' home) country where the foreign-source income will be (possibly eventually) repatriated.

The two tables are not in any way aimed at presenting original research results but rather constructed only by mainly including and arranging quotes from the following past studies (to better grasp the two international tax systems): Knoll (2010), McIntyre (2011), Dittmer (2012), Drabkin, et al. (2013), Dubai (2013), Matheson, et al. (2013), Badley, et al. (2014), Hasegawa, et al. (2015) and OECD (2015).

Table 2 Two Alternative, Pure Systems of Cross-border Corporate Taxation: Worldwide vs. Territorial^a

| | Worldwide ^b | Territorial ^c |
|--|--|--------------------------|
| Pure ^d (Hypothetical ^e) version of the systems: | | |
| 1. Who taxes the foreign-source income ^f taking the form of <i>active</i> income ^g | Both host and home, immediately ⁱ (Contemporaneous tax liability; ^j double taxation or no double taxation ^k) | Only ^h host |
| 2. To lessen the tax burden in home: | | |
| a. Foreign tax credits (Cross-crediting) ^l | Available ^m or none ⁿ | None ^o |
| b. Deferral ^p | None ^q | None |
| 3. Wider differentials among home and host country tax rates increase the incentives for: ^r Cross-border profit-shifting ^s | Most likely but ... ^u | Most likely ^t |

Footnotes to Table 2:

^aHost and home are, respectively, a source country where a foreign income was

earned by a home industry/multinational firms and an industry's/multinational firms' home country where the foreign-source income will be (possibly eventually) repatriated.

The impact on the level of FDI and domestic DI of a switch from worldwide to territorial taxation depends on not only opportunities for deferral, cross-crediting and cross-border profit-shifting available under the two tax systems, but also the home country's corporate tax rate relative to that in the host country (Matheson, et al. 2013, pp.5-11).

^bFor how corporate tax rates (including the dividend withholding tax) and the worldwide system (as compared to territoriality) are related, see Matheson, et al. (2013, pp.5-7).

^cFor how host's corporate tax rates (including the dividend withholding tax) and the territorial system are related, see Matheson, et al. (2013, p.7).

^dSee also footnote *d* in Table 3. See Knoll (2010, p.783), McIntyre (2011), Matheson, et al. (2013, p.3) and Dubay (2013).

^eSee Matheson, et al. (2013, p.6).

^fFor categories of foreign-source income and expense, see, for example, Drabkin, et al. (2013, Table 1, p.3).

^gSee Matheson, et al. (2013, p.3). McIntyre (2011, pp.1-2): "(A)ctive income ... can best be thought of as the profit earned from simply selling a concrete good or service"; "(O)ffshore corporate profits that are supposed to be immediately taxable by home under *any* of these tax systems ... include 'passive' income like interest, dividends, rents, and royalties..."

^hHome uses an exemption system under which foreign-source income is fully exempt from taxation. See Dubay (2013) and McIntyre (2011, pp.1-2).

ⁱSee "2.b. Deferral: None" below.

^jSee Matheson, et al. (2013, p.3).

^kSee "2.a. Foreign tax credits (Cross-crediting): Available or none" below.

^lCredit for taxes paid to the source country on the income earned there. For example see Matheson, et al. (2013, pages 3, 5-6): "(C)ross-crediting allows any excess credits from high-tax countries to be applied to earnings from low-tax countries."

McIntyre (2011, p.3), where American, U.S. and ours may be all replaced by Japanese for the present paper: "American corporations would continue to get a credit against their U.S. taxes for foreign taxes they pay. That means that when an American corporation has profits in a country with a lower corporate tax rate than ours, they would pay to the U.S. government just the difference between the foreign rate and the U.S. rate. When an American corporation has profits in a country with a higher corporate tax rate than ours they would pay nothing to the U.S. government."; "(T)he combination of deferral and the foreign tax credit can create more opportunities for tax avoidance."

Drabkin, et al. (2013, p.10), where the United States and U.S. may be replaced, respectively, by Japan and Japanese for the present paper (with FTC and MNC standing, respectively, for foreign tax credit and multinational corporation): "To avoid the double taxation, the United States allows ... FTCs ... Use of FTCs by U.S. MNCs is limited to ... As a result of this limitation, U.S. MNCs sometimes accumulate FTCs in excess of ... Excess FTCs earned on one specific ... be applied to other foreign source income ... This use of excess FTCs is referred to as 'cross-crediting.' "

^mThen *no* double taxation will result, for "American corporations would continue

to receive a credit against any taxes they pay to a foreign government (the foreign tax credit) so that profits are not double-taxed.” See McIntyre (2011, p.1), where American may be replaced by Japanese for the present paper, and Drabkin, et al. (2013, p.10).

ⁿThen double taxation will result. See Matheson, et al. (2013, p.6).

^oSee Matheson, et al. (2013, p.7).

^pNo taxation in home until the income is repatriated: Deferral of tax until repatriation of the income in the form of dividends from foreign subsidiaries to the home country resident industry/multinational firms. For example see Matheson, et al. (2013, pp.3-4, 7-8).

^qSee Matheson, et al. (2013, p.6) and McIntyre (2011, pp.2-3).

^rSee Matheson, et al. (2013, p.8).

^sFor example see Matheson, et al. (2013, p.5). Drabkin, et al. (2013, p.4), where the United States and U.S. may be replaced, respectively, by Japan and Japanese for the present paper: “Our analysis also distinguishes between income shifting involving the movement abroad of real productive activities that currently reside in the United States (‘job shifting’) and income shifting involving tax avoidance practices including transfer pricing and the relocation of IP (intellectual property) assets that currently generate income taxable in the United States (‘IP shifting’). ... IP shifting affects only U.S. tax collections, while job shifting leads to less real activity in the United States by U.S. MNCs.”; “A recent report ... found that high-tax foreign locations such as Germany, the U.K. and Canada are the leading foreign locations for the real economic activities (of U.S. MNCs), but are not the main foreign locations for their net income. This result is consistent with ... an increased segregation between the location where actual business activities of multinationals occur and the locations where their profits are reported for tax purposes. ... Overall, these findings confirm that tax considerations are more powerful incentives for IP shifting than for job shifting, and that IP shifting has grown in importance in both (worldwide and territorial) systems over time.”

^tMcIntyre (2011, p.3), where American may be replaced by Japanese for the present paper: “Under a territorial system, American corporations would not be taxed on their offshore profits ever, regardless of whether or not they are repatriated.” This suggests shifting more profits offshore (to tax havens, for example).

^uMcIntyre (2011, p.3), where the U.S. and American may be replaced, respectively, by Japan and Japanese for the present paper: “Under a pure worldwide tax system, corporations would have little or no tax incentive to ... shift profits offshore using shady transactions involving tax havens, because the U.S. would tax profits of American corporations no matter where they are generated.”

Table 3 Two Alternative, Actual Systems of Cross-border Corporate Taxation in Japan^a

| | Worldwide Japan ^b (Until March 2009) | Territorial Japan ^c (Since April 2009) |
|--|---|---|
| Hybrid, ^d partial ^e version of the systems: | | |
| 1a. Who taxes the foreign-source income in the form of <i>dividend</i> ^f | Both EU and (home) Japan, though <i>not</i> immediately in (home) Japan | EU and (home) Japan, respectively, for all and only a small portion (none or about 5%) ^g of the <i>active</i> income |
| 1b. Who taxes <i>other forms</i> of the foreign-source income ^h | Both EU and Japan, immediately (Contemporaneous tax liability; double taxation) | Both EU and Japan ⁱ (Contemporaneous tax liability; double taxation) |
| 2. Repatriation tax on foreign earnings ^j | Imposed in Japan | Imposed in Japan ^k |
| 3. To lessen the repatriation tax burden: | | |
| a. Foreign tax credits (Cross-crediting) ^l | Available: ^m More liberal one ^o Less liberal one ^p | Available ⁿ |
| b. Deferral | Available ^q | Not available ^r |
| 4. Wider differentials among home and host country tax rates increase the incentives for: ^s | | |
| Cross-border profit-shifting ^t | Most likely ^u | Most likely ^v |

Footnotes to Table 3:

^aEU and Japan are, respectively, a (host, that is, source) country where a foreign income was earned by a Japanese industry/multinational firms and a (Japanese industry's/multinational firms') home country where the income will be repatriated. See also footnote *a* in Table 2.

^bDrabkin, et al. (2013, p.1), where the United States and U.S. may be replaced, respectively, by Japan and Japanese for the present paper: "The (hybrid worldwide) system, along with a relatively high corporate tax rate, has features that *both encourage* U.S. MNCs to shift income out the country to lower-tax jurisdictions *and discourage* the U.S. MNCs from repatriating their active foreign source earnings to the United States."; "(Thus, e)arnings held abroad by U.S. MNCs are locked-out of the U.S. corporate tax base. The U.S. Treasury collects no revenue on these earnings unless and until they are repatriated."

For how corporate tax rate (including the dividend withholding tax) and the worldwide system (as compared to territoriality) are related, see Matheson, et al. (2013, pp.5-7).

^cDrabkin, et al. (2013, p.2): "(T)here is no single territorial tax system in use across the world ..."; "the main characteristic that all territorial systems have in common: they exempt most active foreign source earnings from home-country tax-

tions. Territorial systems differ, however, with respect to other significant elements, in particular, the home-country corporate tax rate and anti-base erosion provisions.”

The reasons Japan (and the U.K.) moved to territoriality include “simplification and encouraging repatriation of large pools of earnings retained offshore” (Matheson, et al. 2013, p.5). Matheson, et al. (2013, p.9): “Japan accompanied its move to territoriality with a tightening of its cross-border minimum tax, which subjects earnings from countries with low effective corporate tax rates to the CFC regime (controlled foreign corporation rules).” For the the CFC rules see footnote *i* and also OECD (2015) which is briefly summarized on the Webpage located at <http://www.oecd.org/ctp/designing-effective-controlled-foreign-company-rules-action-3-2015-final-report-9789264241152-en.htm> as follows: “This report sets out recommendations in the form of building blocks for effective CFC rules. The recommendations are designed to ensure that jurisdictions that choose to implement them, have rules that effectively prevent taxpayers from shifting income into foreign subsidiaries. The report sets out the following six building blocks for the design of effective CFC rules: (1) definition of a CFC, (2) CFC exemptions and threshold requirements, (3) definition of income, (4) computation of income, (5) attribution of income, and (6) prevention and elimination of double taxation. Because each country prioritises policy objectives differently, the recommendations provide flexibility to implement CFC rules that combat BEPS in a manner consistent with the policy objectives of the overall tax system and the international legal obligations of the country concerned.”

For how corporate tax rate, a move to territoriality, the tax burden and the (out-bound) FDI are related, see Matheson, et al. (2013, pp.5-6).

For Japan’s transition to territoriality see also Dittmer (2012), Badley, et al. (2014, pp.8-11), and Hasegawa, et al. (2015, pp.1-9), quoted from which is “Japan ... used a worldwide income tax system until the end of March 2009. ... Japan introduced a foreign dividend exemption system in April 2009 that ...”

^dKnoll (2010, p.783): “No country uses either a pure worldwide or a pure territorial tax system; most countries use hybrid tax systems that combine elements of both systems. Many countries employ a hybrid that taxes active income on a territorial basis and passive income on a worldwide or residence basis. In practice, such an approach often results in taxing corporate income at source and individual income at the investor’s residence. Accordingly, if the United States were to adopt such a hybrid, the U.S. corporate income tax would not operate as a toll charge on foreign source income and U.S.-based corporations would not be disadvantaged when investing overseas.”

See McIntyre (2011, p.1): The worldwide with deferral available is a hybrid of the pure worldwide system (with no deferral) and (pure) territoriality, both as summarized in Table 2. See footnotes *i* and *q*.

Drabkin, et al. (2013, p.2): “(A)n actual territorial system implemented ..., like the systems in other advance countries, would be a ‘hybrid’ that incorporates effective base-erosion safeguards. (T)he analysis ... will provide useful guidelines for the design of a hybrid territorial system ...

^eSee Matheson, et al. (2013, p.3).

^fSee Matheson, et al. (2013, p.5). McIntyre (2011, p.2), where U.S. may be replaced by Japanese for the present paper: “Typically, repatriation would take the form of a dividend paid by the subsidiary to the U.S. parent corporation.”

^gDubay (2013): “(F)oreign income is mostly exempt from taxation. The exemption

is generally 95 percent ... Taxing a small portion of foreign earnings serves as” Drabkin, et al. (2013, p.1): “territorial systems that largely exempt active foreign source earnings from home-country taxation.”

Japan employs the 95% exemption (see Dittmer 2012). Note, however, that “(t)he majority of OECD countries that uses a territorial system exempts 100% of active foreign earnings, while a minority exempts 97% or 95% of such earnings” (Drabkin, et al. 2013, p.2).

^hSee Matheson, et al. (2013, p.9). See also footnote *g* in Table 2.

ⁱCurrently Japan is a territorial country only to the extent of the foreign dividend exemption, and otherwise worldwide income taxation will apply. (See footnote *d*.) Matheson, et al. (2013, p.9): “Countries with a territorial regime for foreign dividends paid out of active earnings usually still maintain a worldwide regime for other forms of income. Moving from worldwide to territorial taxation thus does not eliminate the need for CFC ... rules—on the contrary, it increases their importance, ... Generally speaking, the tighter a high-tax country’s CFC rules—that is, the narrower the scope of earnings exemption under a territorial regime—the less sensitive its investment will be to host country tax rates.” In other words, as the 100% rather than 95% of earnings is not taxed in the home country (that is, as the scope of earnings exemption becomes wider, or, as a territorial regime is closer to pure), the outbound FDI will be more affected by the host’s tax rates. See McIntyre (2011, pp.1-2) in footnote *q*.

^jMatheson, et al. (2013, pp.9-11): “(E)ffective repatriation tax rates are usually observed to be quite low ... suggesting they are not highly distortive. ... However, (in the U.S.) the implicit repatriation tax rate on the bulk of offshore retained earnings may be much higher. ... (R)epatriation taxes can clearly distort corporate financing. ... (T)erritoriality will likely cause a shift from financing foreign investment out of retained earnings towards use of new equity and debt. ...” For how corporate tax rate and financing FDI are related, see Matheson, et al. (2013, pp.10-11).

^kSee footnotes *h* and *i* immediately above (as well as footnote *g*).

^lSee the footnote it *l* in Table 2.

^mSee Matheson, et al. (2013, pp.3-5). Matheson, et al. (2013, pp.8-9): “While cross-crediting, profit-shifting and deferral soften the bite of worldwide taxation, controlled foreign corporation (CFC) rules give it more teeth. Most countries allow deferral only for ‘active’ foreign earnings, while ‘passive’ earnings (from securities investment by non-financial firms) are subject to current taxation. The distinction between active and passive earnings can be set ... to limit the benefits of deferral; for example, a parent must usually have ... in order for its dividend income to qualify as active. Pooling of foreign tax credits is usually also restricted ...”

ⁿSee Matheson, et al. (2013, p.5).

^oSee Matheson, et al. (2013, p.6). For example, there are no such restrictions as those mentioned in the footnote just below.

^pSee Matheson, et al. (2013, p.7): There are present “restrictions on cross-crediting, such as limiting it to particular types of income or income from a particular country or set of entities(,)” in which “particular types of income” may include *dividend* income.

^qSee Matheson, et al. (2013, pp.3-5,7). Matheson, et al. (2013, pp.7-8): “This (The deferral) allowed corporations to defer home country taxation indefinitely by keeping earnings ‘offshore’ and reinvesting them either directly in active projects or passively in securities. Passive investments could even be made in ... (S)o a worldwide system with deferral can fairly mimic a territorial regime. Taking ad-

vantage of this feature, ... The widespread exploitation of deferral under worldwide regimes would mute the ... effects of a shift to territoriality.” (For a hybrid worldwide taxation see footnote *d*.)

Drabkin, et al. (2013, p.28), where U.S. may be replaced by Japanese for the present paper: “(T)he current (U.S. worldwide) system allows many of them (U.S. MNCs) to operate as if they were in a territorial system. To the extent a U.S. MNC chooses to defer the repatriation of its active foreign source earnings, it can avoid paying residual U.S. taxes on those earnings. Thus deferral allows U.S. MNCs to blunt the potential tax-based competitive disadvantage relative to foreign MNCs.”

Matheson, et al. (2013, p.10): “... the disincentive for dividend repatriation under a worldwide regime with deferral ...”

McIntyre (2011, pp.1-2), where the U.S. and American may be replaced, respectively, by Japan and Japanese for the present paper: “Often, these offshore profits are *never* repatriated.”; “Because the U.S. does not tax profits generated offshore (unless the profits are repatriated), corporations could pay less taxes by moving production to a country with lower corporate income taxes.”; “(D)eferral creates an incentive for American corporations to disguise their U.S. profits as ‘foreign’ profits. They do this by engaging in transactions that shift their profits to subsidiaries in countries that tax the profits lightly or not at all (countries that serve as corporate tax havens). For example, ...” (see “Cross-border profit-shifting” below). For profit shifting see also McIntyre (2011, pp.5-6).

[†]Matheson, et al. (2013, pp.10-11): “By eliminating the disincentive for dividend repatriation under a worldwide regime with deferral, territoriality will likely cause ... (F)llowing the ... Japan’s adoption of exemption in 2009 ..., the initial surge of dividend repatriations, which cleared the backlog of earnings retained offshore under deferral, was ...”.

[§]See Matheson, et al. (2013, p.8).

[‡]See also footnote *s* in Table 2, for two types of income shifting to be distinguished. Matheson, et al. (2013, p.8): “(C)orporations have an incentive to use these techniques (such as transfer pricing and thin capitalization, for cross-border profit-shifting) under worldwide systems with deferral as well, but this incentive is augmented under territoriality.” For profit shifting and transfer pricing, see also McIntyre (2011, pp.5-6).

[‡]See Matheson, et al. (2013, pages 5 and 8). See also McIntyre (2011) in footnote *q*.

[‡]See Matheson, et al. (2013, pages 5 and 8). See McIntyre (2011) as quoted in footnote *t* in Table 2.

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