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경영학박사 학위논문

**Tax-Motivated Income Shifting by  
Multinationals under a Worldwide Tax  
System: Evidence from Korea**

전세계과세 다국적기업들의 조세유인에 의한  
소득이전: 한국기업을 중심으로

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서울대학교 대학원  
경영학과 경영학 전공  
송 보 미



# Tax-Motivated Income Shifting by Multinationals under a Worldwide Tax System: Evidence from Korea

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## Abstract

# Tax-Motivated Income Shifting by Multinationals under a Worldwide Tax System: Evidence from Korea

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This study first provides the empirical evidence on tax-motivated income shifting by multinationals under a worldwide tax system at the subsidiary level. Using subsidiary-specific data of Korean multinationals during 2006-2015, I find that multinationals subject to a worldwide tax regime shift income out of a parent country to low corporate tax rate countries to reduce their worldwide tax burden, consistent with regulators' concerns about international tax avoidance. In addition, I find that the parent-country outward income shifting has decreased after the adoption of International Financial Reporting Standards (IFRS). But the parent-country outward income shifting is not affected by the Base Erosion and Profit Shifting (BEPS) package for curbing the international tax avoidance. Furthermore, I show that multinationals utilize intercompany

capital transactions with their foreign subsidiaries as a means of international income shifting.

**Keywords:** Income shifting, Worldwide tax system, Tax avoidance, Tax planning, BEPS, IFRS, Intercompany transaction

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# 1. Introduction

Globally, regulators' concerns have been growing over corporate tax avoidance since governments experienced dwindling tax revenues due to the global financial crisis of 2007-2008. Particularly, they are concerned about multinational tax avoidance through income shifting that weakens countries' tax base.<sup>1</sup> It is increasing as the number of multinationals increases in the era of globalization, but national tax laws do not keep up with the times and have loopholes. In addition, to avoid taxes, multinationals including Starbucks and Google use a variety of ways to reduce and increase the earnings of foreign subsidiaries located in high and low corporate tax rate countries, respectively. Accordingly, international organizations such as Organization for Economic Cooperation and Development (OECD) and the Group of 20 (G20) have pursued efforts to modernize the international tax system in order to curb this international tax avoidance in recent years. The Base Erosion and Profit Shifting (BEPS) package, formally endorsed by the G20 leaders in November 2015, is an example.

As such, tax-motivated income shifting by multinationals has continued to receive a lot of concerns. But, prior research related to cross-jurisdictional income shifting by multinationals under a worldwide tax system involving repatriation issues provides mixed evidence (e.g., Collins et al. 1998; Klassen

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<sup>1</sup> I define income shifting as “a plan or structure that causes relatively more income to be earned in lower tax rate jurisdictions than would otherwise be expected based on the firm's worldwide asset allocation (Klassen and Laplante 2012a, p.1246)” in this study.

and Laplante 2012a). Furthermore, prior literature on multinational income shifting utilizes data which have some limitations. For example, prior studies on income shifting by U.S. multinationals under a worldwide tax system use the cross-country average tax rate rather than a country-specific statutory tax rate as a proxy for a foreign tax rate due to data availability (e.g., Klassen and Laplante 2012a, 2012b). Therefore, I explore the tax-motivated income shifting activities of multinationals subject to a worldwide tax regime by using subsidiary-level data of Korean multinationals. Specifically, I investigate whether multinationals under a worldwide tax system shift income into a parent country from high-tax foreign countries (a parent-country inward income shifting) and to shift income out of a parent country to low-tax foreign countries (a parent-country outward income shifting) at the subsidiary-level.

The international income shifting issues have been getting a lot more attention around the world since the BEPS project began in June 2012. Under the BEPS project, OECD had developed the package of measures to address perceived flaws in international tax rules in order to tackle multinationals' corporate tax avoidance, and finally, the BEPS package was formally endorsed at the G20 summit in November 2015. In response, many countries including Korea, one of the G20 nations, revised the relevant tax laws immediately to reflect the endorsed BEPS reports. In Korea, according to the Law for the Coordination of International Tax Affairs amended in accordance with the BEPS package, effective as of January 1, 2016, firms should submit a

Combined Report of International Transactions including information about their transfer price policy to the tax authority. Thus, I also examine whether the BEPS project affects the income shifting activities of multinationals. Meanwhile, given that accounting rules as well as tax rules have effects on a firm's tax planning, International Financial Reporting Standards (IFRS) adoption can also affect tax-motivated income shifting by multinationals under a worldwide tax system. However, little empirical evidence exists regarding this issue. Hence, I additionally explore the effect of IFRS adoption on the multinationals' income shifting strategies. Finally, this study investigates what kinds of transactions multinationals do with their foreign subsidiaries for tax-motivated income shifting, which is scarcely explored in prior literature.

To test the tax-motivated income shifting activities of multinationals under a worldwide tax system, I hand-collect subsidiary data of large Korean multinationals spanning the period 2006-2015. I use Korean data not only because Korea adopted the worldwide tax system, but also because Korean top statutory corporate tax rate is positioned in the middle (e.g., 24.2% as of 2015). Thus, this study can better investigate the directional tax-motivated income shifting by multinationals subject to a worldwide tax regime through the use of a sample of Korean multinationals.

The empirical findings of this study are summarized as follows. First, the lower the statutory tax rate of a foreign country in which a low-tax foreign subsidiary is located, the more a multinational under a worldwide tax system



shifts income out of a parent country to the low-tax country. This indicates that multinationals subject to a worldwide tax regime utilize their low-tax foreign subsidiaries to ease their worldwide taxes, consistent with regulators' concerns. On the other hand, multinationals subject to a worldwide tax regime do not shift income into a parent country from high-tax countries. This finding may seem to be inconsistent with prior literature which documents a parent-country inward income shifting and my prediction. But this inconsistency would be interpreted as evidence that multinationals take advantage of high-tax foreign subsidiaries as a way of activating or expanding their business rather than tax planning and/or developed countries' strong monitoring mechanisms for international income shifting curb a parent-country inward income shifting of Korean multinationals. Second, the multinationals' tax-motivated income shifting is not affected by the BEPS package for hindering international tax avoidance. Third, the multinationals' tax-motivated income shifting has decreased after IFRS adoption. Fourth, multinationals make use of capital transactions with their foreign subsidiaries as a way of multinational income shifting. Fifth, multinationals use tax havens more than non-tax havens for international income shifting. Finally, multinationals do not engage in tax-motivated income shifting strategies after they received tax penalties as a result of a tax investigation.

This study should be of interest to academicians, policymakers, regulators, and practitioners in several ways. First, I extend the research on tax-motivated

income shifting by utilizing subsidiary-specific data of large Korean multinationals subject to a worldwide tax regime and examining the impact of the BEPS project. Particularly, this study provides a valuable policy implication that tax-motivated income shifting by multinationals under a worldwide tax system are not immune to business environments and/or mechanisms for monitoring international income shifting. In addition, I contribute to the literature on cross-jurisdictional income shifting and on IFRS by exploring the effect of IFRS adoption on the income shifting activities of multinationals under a worldwide tax system. Finally, this study adds to the literature on international corporate tax avoidance and on intercompany transactions by providing the direct empirical evidence on the types of intercompany transactions used as a means of international tax-motivated income shifting by multinationals.

The remainder of this study proceeds as follows. The next section explains the taxation setting in Korea. In Section 3, I review the related prior literature and develop my hypotheses. In Section 4, I present the research design and, in Section 5, I describe the data and sample characteristics. Section 6 shows my empirical results. Finally, Section 7 concludes.

## **2. The Korean Taxation Setting**

## **2.1. The Korean Taxation of Foreign Income**

There are two approaches in regards to the taxation of foreign income as follows. First, under a worldwide tax system, a country taxes the worldwide income of its domestic firms at its tax rate. Instead, the country generally does not tax foreign operating earnings until repatriated and when the foreign operating earnings are repatriated, it allows foreign tax credits (FTC) for the foreign tax already paid up to the amount of foreign source income multiplied by its tax rate. Thus, when a statutory tax rate of a country in which a foreign subsidiary is located exceeds a domestic statutory tax rate, a parent-country inward income shifting leads to a permanent reduction in a multinational's worldwide taxes (Klassen and Laplante 2012b). On the other hand, when a statutory tax rate of a country where a foreign subsidiary is incorporated is below a domestic statutory tax rate, the benefits of a parent-country outward income shifting depend on the length of a deferral period and the costs of delaying repatriation (Collins et al. 1998).<sup>2</sup> Accordingly, multinationals subject to a worldwide tax regime are more likely to shift income to low-tax foreign subsidiaries when the shifted income can be reinvested and therefore defer taxable repatriation (Klassen et al. 2014; Markle 2016). Korea adopted the worldwide tax system.

Second, under a territorial tax system, a country taxes solely income that was earned within its borders, which is contrary to a worldwide tax system. But

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<sup>2</sup> Repatriation taxes appear to lower the multinationals' incentive to shift income (Markle 2016).

a country is also likely to have tight anti–abuse rules (Mills and Newberry 2004).<sup>3</sup>

## **2.2. Korean Statutory Corporate Tax Rate**

Korean top statutory corporate tax rate is positioned in the middle, as shown in Table 1 which presents a statutory tax rate by country where consolidated subsidiaries of sample parents are located in 2015. Therefore, Korean multinationals enable researchers to better examine the directional tax-motivated income shifting by multinationals under a worldwide tax system.<sup>4,5</sup>

[Insert Table 1 around here]

## **3. Related Literature and Hypotheses Development**

### **3.1. Tax-Motivated Income Shifting by Multinationals**

With regard to the directional income shifting by multinationals subject to a worldwide tax regime, prior literature provides the mixed theoretical evidence. To be specific, Hartman (1985) shows that if the after-tax rate of return is the same across foreign and domestic operations, there is no reduction in the

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<sup>3</sup> All the members of the group of 8 (G8) except for the U.S. adopted the territorial tax system (Markle 2016).

<sup>4</sup> I exclude subsidiary-years with insufficient data to measure a subsidiary country's statutory tax rate.

<sup>5</sup> In India, there exists a separate statutory tax rate for foreign firms and a statutory tax rate for domestic firms is 34.61% as of 2015.

present value of taxes by delaying repatriation (Scholes et al. 2008). Thus, on a present value basis, there is no benefit to the deferral of repatriation from a low-tax foreign country. This implies that there is no benefit to a parent-country outward income shifting without an incentive to delay repatriation (Klassen and Laplante 2012a). Meanwhile, Sinn (1993) extends the Hartman model in consideration of the foreign investment's life cycle. According to the Hartman-Sinn model, in equilibrium, the parent will initially underinvest in the foreign subsidiary in order to allow early earnings to be reinvested, permitting growth to the value-maximizing investment level before repatriating earnings. This indicates that there are times when a parent-country outward income shifting is beneficial (Klassen and Laplante 2012a). Next, the Hartman-Sinn model is extended by Weichenrieder (1996) and Altshuler and Grubert (2002). They allow a subsidiary's earnings to be invested in financial assets when the value-maximizing real asset investment level is reached. If the financial assets enable the parent to borrow for domestic investment or allow triangular repatriation strategies, the parent's initial underinvestment is no longer optimal. Hence, in this case, repatriation taxes are inconsequential and a parent-country outward income shifting is as beneficial as a parent-country inward income shifting (Klassen and Laplante 2012a). But if significant costs related to future repatriation exist, the parent would be reluctant to shift additional income (Weichenrieder 1996; Altshuler and Grubert 2002).

The empirical evidence on the income shifting by multinationals under a

worldwide tax system is also mixed. Specifically, Collins et al. (1998) find only a parent-country inward income shifting by U.S. multinationals. This is consistent with Hartman (1985) but in contrast to conventional wisdom and regulators' concern that significant revenue is lost since multinationals shift income to low-tax foreign countries. On the other hand, other prior studies show tax-motivated income shifting by U.S. multinationals both into and out of the U.S. (Klassen et al. 1993; Clausing 2009; Klassen and Laplante 2012a), consistent with Altshuler and Grubert (2002).

In addition, the data used in prior empirical research on income shifting by U.S. multinationals have some limitations as follows. First, a foreign tax rate, a component of a proxy for the tax incentive to shift income ( $FTR$ ), is averaged across jurisdictions in some prior studies (e.g., Collins et al. 1998).<sup>6</sup> To be specific, it is calculated as tax expense reported for foreign jurisdictions for period  $t$  ( $TE_{f,t}$ ) divided by pretax income reported for foreign jurisdictions for period  $t$  ( $PTI_{f,t}$ ). Accordingly,  $FTR$  varies significantly every year even though the tax incentive is generally stable across periods. In particular,  $TE_{f,t}$  can vary considerably every year because of the underlying accounting rules unrelated to the tax incentive (e.g., a valuation allowance) (Klassen and Laplante 2012a). Second, to address the potential measurement error in  $FTR$ , Klassen and Laplante (2012a, 2012b) use the five-year average foreign tax rate incentive ( $AvgFTR$ ,  $\sum TE_{f,t-m} / \sum PTI_{f,t-m} - 1/5 * \sum t_{d,t-m}$  ( $m = 0,1,2,3,4$ )) and the lagged

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<sup>6</sup>  $FTR$  is measured as subtracting a domestic statutory tax rate ( $t_{d,t}$ ) from a foreign tax rate ( $t_{f,t}$ ).

values of *FTR* (*HatFTR*) as instruments for *FTR*. However, these measures are also based on the cross-country average tax rate rather than a country-specific statutory tax rate, which may lead to them being negatively affected by income shifting (Klassen and Laplante 2012a).<sup>7</sup>

There also exists prior empirical literature on income shifting by non-U.S. multinationals. Mills and Newberry (2004) and Beuselinck et al. (2015) are examples. Specifically, to investigate the income shifting activities of multinationals, Mills and Newberry (2004) use a matched sample of financial data on foreign multinationals and income tax return data on U.S. foreign-controlled firms during 1987-1996 and Beuselinck et al. (2015) use a sample of subsidiaries in European Union (EU) countries majority-owned by European multinationals during 1998-2009. While both studies employ a country-specific statutory tax rate as a proxy for a foreign tax rate, the samples of these studies include parent countries under a territorial tax system as well as those under a worldwide tax system, which make it difficult for researchers to hold many variables constant, including parent-country tax rules and financial accounting rules (Dyreng and Lindsey 2009).

Therefore, using subsidiary-specific data of Korean multinationals, I examine tax-motivated income shifting by multinationals under a worldwide

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<sup>7</sup> This is because low rates may be overweighted by shifting income to low-tax jurisdictions in the averaging process. To address this concern, Klassen and Laplante (2012a) also utilize an alternative set of instruments, the vector of country indicators of Dyreng and Lindsey (2009). But they acknowledge that it is inferior to the past realizations of *FTR*.

tax system as follows:

**H1a:** Multinationals under a worldwide tax system shift income into a parent country from high-tax countries.

**H1b:** Multinationals under a worldwide tax system shift income out of a parent country to low-tax countries.

### **3.2. The Effect of the BEPS Project on Income Shifting**

The tax-motivated income shifting issues have received more attention worldwide since the BEPS project began in June 2012.<sup>8</sup> Under the BEPS project, OECD had developed the package of measures for modernizing the international tax system in order to curb multinationals' corporate tax avoidance. The BEPS package was first released in July 2013 by OECD, and finally, formally endorsed by the G20 leaders in November 2015. In response, many countries including Korea have amended the relevant tax laws to reflect the endorsed BEPS reports. Specifically, in Korea, the Law for the Coordination of International Tax Affairs was amended to strengthen the requirements for transfer pricing documentation, in accordance with the BEPS package, and became effective in 2016. According to the revised law, Korean firms having

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<sup>8</sup> BEPS refers to "tax planning strategies that exploit gaps and mismatches in tax rules to artificially shift profits to low or no-tax locations ... , resulting in little or no overall corporate tax being paid" (See 'BEPS 2015 Final Reports' available online at: <http://www.oecd.org/tax/beps-2015-final-reports.htm>).



the amounts of transactions with their foreign related parties and annual sales that correspond to the law's requirements should submit a Combined Report of International Transactions to the tax authority. The report includes, for example, information on a multinational's global business and transfer price policy and a local firm's details of related party transactions.

Under the circumstances, multinationals may have become reluctant to shift income across jurisdictions for tax purposes and have been getting BEPS-related tax advice from tax professionals to rapidly respond to the BEPS project. But it takes time to do tax planning and therefore the BEPS project would gradually affect the income shifting activities of multinationals. In sum, it is uncertain whether tax-motivated income shifting by multinationals is affected by the BEPS project. Furthermore, there is no empirical evidence on this issue.

Based on these arguments, I form the null hypothesis as follows:

**H2:** Income shifting strategies of multinationals are not affected by the BEPS project.

### **3.3. The Effect of IFRS Adoption on Income Shifting**

In Korea, large public firms, initial public offering firms and certain financial firms are mandated to adopt IFRS since 2011.<sup>9,10</sup> Given that the

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<sup>9</sup> The early adoption of IFRS was allowed for these firms excluding the financial firms from 2009.

<sup>10</sup> The U.S. allowed foreign firms to use IFRS without reconciliation after 2007.

ability of multinationals to hide transactions which lack their business purposes could be affected by financial reporting transparency (De Simone 2016), increased financial statement transparency resulting from IFRS adoption (e.g., Barth et al. 2008) would limit tax-motivated income shifting by multinationals. Meanwhile, to justify transfer prices to tax authorities, multinationals often benchmark intercompany profit allocations against the range of profit margins reported by economically comparable and independent firms using similar accounting standards. This is because arm's length transfer prices are generally unobservable (PwC 2006; McKinley and Owsley 2013). Hence, the adoption across jurisdictions of a common set of accounting standards such as IFRS expands the set of qualifying benchmarks, which could enable multinationals to support tax-advantaged transfer prices with more flexibility (De Simone 2016). However, the adoption also provides tax authorities with a larger set of benchmarks to enforce tighter comparability criteria, which reduce the flexibility of transfer pricing (De Simone 2016).

Based on the arguments, I form the null hypothesis as follows:

**H3:** Income shifting strategies of multinationals are not affected by the adoption of IFRS.

### **3.4. Types of Intercompany Transactions used for Income Shifting**

Multinationals can shift income across jurisdictions through intercompany transactions with their foreign subsidiaries. But the empirical evidence on the types of intercompany transactions used for international income shifting scarcely exists even though there are considerable concerns about the tax-motivated income shifting activities of multinationals. Thus, I investigate this issue by the intercompany transactions' type.

Multinationals would have an incentive to reduce the income of high-tax subsidiaries and increase the income of low-tax subsidiaries through various techniques in order to reduce their worldwide burden. Debt location is one of ways for multinationals to shift income across jurisdictions for tax savings because interest deductions reduce a firm's income (Newberry and Dhaliwal 2001; Huizinga et al. 2008; Klassen and Laplante 2012b; Buettner and Wamser 2013; Faulkender and Smith 2016). Therefore, multinationals would have an incentive to locate debt in high corporate tax rate countries rather than in low corporate tax rate countries. In addition, given that repatriation taxes are generally deferred until the earnings of low-tax subsidiaries are remitted to a parent country under a worldwide tax system (Collins et al. 1998) and that a firm has discretion on the amount and timing of dividend payment, unlike interest payment, multinationals would prefer to provide funds in the form of equity to low-tax subsidiaries. These lead to the following hypothesis:

**H4:** Multinationals provide funds in the form of debt to high-tax foreign

subsidiaries rather than to low-tax foreign subsidiaries for tax-motivated income shifting.

Multinationals can also reduce their worldwide taxes by shifting income across jurisdictions through asset sales (Jung et al. 2009). Specifically, through the transfer of noncurrent assets from high-tax countries to a parent country or from a parent country to low-tax countries, multinationals can cause relatively more profits to be earned in low-tax foreign countries than would otherwise be expected on the basis of their worldwide asset allocation. This is because a firm can earn revenues in excess of related expenses such as depreciation and amortization costs by using these noncurrent assets.<sup>11</sup> Particularly in this case, multinationals would prefer to utilize intangibles which are easy to transfer and are not accompanied by the establishment of physical facilities. In fact, the relative mobility of intangible assets reportedly facilitates income shifting (e.g., Grubert 2003; Markle and Shackelford 2012). Also, there are concerns that as the multinationals' proportion of intangible assets increases, so does their international tax avoidance.<sup>12,13</sup> Meanwhile, non-current assets usually have special features and thus lack arm's length prices, leading to difficulty in regulatory enforcement of transfer pricing for them (Klassen and Laplante

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<sup>11</sup> Multinationals would transfer noncurrent assets with market value which exceeds book value to low-tax foreign subsidiaries as a means of tax-motivated income shifting.

<sup>12</sup> The news article in The Asia Business Daily on 29 Nov, 2015 (available from <http://view.asiae.co.kr/news/view.htm?idxno=2015112912043304113>) is an example.

<sup>13</sup> Multinationals in an information technology (IT) industry or a high-tech industry would utilize intangible assets for international tax avoidance.

2012a). Therefore, multinationals can also do tax planning which adjusts transfer prices of intercompany asset transactions with their foreign subsidiaries. For instance, low-tax foreign subsidiaries can transfer noncurrent assets to their parent firm at a high price as a means of tax-motivated income shifting. But gains on disposition of noncurrent assets affect the subsidiaries' profitability only in the period that the transactions occur. Taken together, multinationals would generally have an incentive to transfer noncurrent assets which generate revenues to low corporate tax rate countries. These lead to the following hypotheses:

**H5a:** Multinationals transfer non-current assets to low-tax foreign subsidiaries rather than to high-tax foreign subsidiaries for tax-motivated income shifting.

**H5b:** Multinationals acquire non-current assets from high-tax foreign subsidiaries rather than from low-tax foreign subsidiaries for tax-motivated income shifting.

## **4. Research Design**

### **4.1. Test of H1**

To explore whether multinationals subject to a worldwide tax regime shift

income into a parent country from high-tax countries and to shift income out of a parent country to low-tax countries for tax savings, I employ the following regression model<sup>14</sup>:

$$\begin{aligned}
RoS_{it} = & \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * STRDiff_{it} \\
& + \beta_3 LowSTRDiff_{it} * STRDiff_{it} + \beta_4 CFC_{it} + \beta_5 TE_{it} + \beta_6 Lev_{it} \\
& + \beta_7 AssetTO_{it} + \beta_8 MRoS_{it} + \beta_9 Msales_{it} + \beta_{10} Mtangibility_{it} \\
& + \beta_{11} Mintangibles_{it} + \beta_{12} Mmtb_{it} + \beta_{13} MOCF_{it} + \beta_{14} Missue_{it} \\
& + \beta_{15} Ownership_{it} + \beta_{16} GDPGrowth_{it} + Country\ dummies \\
& + Industry\ dummies + Year\ dummies + \varepsilon_{it}
\end{aligned} \tag{1}$$

The dependent variable (*RoS*), a proxy for income shifting, is a subsidiary's return on sales (Beuselinck et al. 2015). The independent variables of interest are the interaction terms, *HighSTRDiff* \* *STRDiff* and *LowSTRDiff* \* *STRDiff* (e.g., Klassen and Laplante 2012b). I use *STRDiff*, the applicable statutory tax rate in a subsidiary's country minus the applicable statutory tax rate in a parent's country, to proxy for a multinational's tax incentive to shift income.<sup>15</sup> I also utilize *HighSTRDiff*, an indicator variable equal to 1 if the

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<sup>14</sup> The subscripts *i* and *t* refer to the subsidiary and year indicator, respectively.

<sup>15</sup> Since multinationals would generally make decisions about tax-motivated income shifting based on an *ex-ante* measure of a foreign subsidiary's tax burden, each country's statutory tax rate, following prior literature, I utilize a statutory corporate tax rate of a foreign country and that of a domestic country as a proxy for a foreign tax rate and a domestic tax rate, respectively. However, it would also be meaningful to examine international income shifting by multinationals using the average tax rate, an *ex-post* measure of a firm's tax burden. In general, the average tax rate is defined as "the present value of current plus deferred income taxes (both explicit plus implicit taxes) divided by the present value of taxable income (where taxable income is again grossed up to include

value of *STRDiff* is greater than 0, and 0 otherwise, to proxy for a subsidiary in a high-tax country. Similarly, *LowSTRDiff*, an indicator variable equal to 1 if the value of *STRDiff* is less than or equal to 0, and 0 otherwise, is used to proxy for a subsidiary in a low-tax country. First, to test H1a, I examine  $\beta_2$ , the coefficient on *HighSTRDiff* \* *STRDiff*, which represents a parent-country inward income shifting. If a multinational firm under a worldwide tax system shifts income into a parent country from high corporate tax rate countries, the coefficient would be negative. Next, to test H1b, I examine  $\beta_3$ , the coefficient on *LowSTRDiff* \* *STRDiff*, representing a parent-country inward income shifting. If a multinational firm subject to a worldwide tax regime shifts income out of a parent country to low corporate tax rate countries, the coefficient would have a negative sign.

In Equation (1), I add some variables to control for the effects of other determinants on a subsidiary's profitability. First, a variable which represents a disincentive for a multinational firm to defer repatriation (and thus shift income out of a parent country to low-tax countries to avoid tax) (*CFC*) is included.<sup>16</sup> I also include *TE* to control for subsidiary country-level tax enforcement (Beuselinck et al. 2015), and *Lev* and *AssetTO*, a subsidiary's leverage and asset

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implicit taxes paid) (Scholes et al. 2008, p.211)" and thus regarded as a better proxy for a taxpayer's tax burden than effective tax rates (Scholes et al. 2008). Future research can further add to the literature on tax-motivated income shifting by making use of data on the average tax rate.

<sup>16</sup> According to the Controlled-Foreign Corporation (CFC) rule, for certain foreign firms, the amount imputable to a parent out of the retained earnings distributable as of the end of each business year of the foreign subsidiary shall be deemed a dividend paid to the parent. This rule is provided in articles 17 and 18 of the Law for the Coordination of International Tax Affairs in Korea.

turnover ratio, to control for a multinational firm's financial strategies that can be used in shifting income and capital intensity per unit of sales, respectively (Grubert 2003; Beuselinck et al. 2015). Further, parent-level consolidated profitability (*MROS*) and sales (*Msales*) are used to control for a multinational's overall profitability and size (Grubert 2003; Beuselinck et al. 2015). In addition, I control for parent-level consolidated tangibility (*Mtangibility*) and intangibles (*Mintangibles*) which can affect the cost of income shifting (e.g., Harris 1993; Klassen and Laplante 2012a). I also add parent-level consolidated growth opportunities (*Mmtb*), solvency (*MOCF*), external financing (*Missue*) and percentage ownership for a subsidiary (*Ownership*), and a subsidiary country-level rate of economic growth (*GDPGrowth*) which may be correlated with trends in a subsidiary's profits (Beuselinck et al. 2015).<sup>17</sup> Finally, I control for possible variations across different subsidiaries' countries (*Country dummies*) and industries (*Industry dummies*, defined based on one-digit Korea Standard Industry Code), and different years (*Year dummies*). In the regression, I report t-statistics that are based on standard errors adjusted for two-way (multinational firm and year) clustering to correct for cross-sectional and serial correlation (Petersen 2009).

## 4.2. Tests of H2 and H3

To examine whether the BEPS project and the adoption of IFRS affect

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<sup>17</sup> All the variables are defined in Appendix.



multinationals' income shifting activities, I divide my sample into three based on indicator variables of the release of the BEPS package (*BEPS*) and IFRS adoption (*IFRS*): pre-IFRS (2006-2010), post-IFRS/pre-BEPS (2011-2013) and post-BEPS (2014-2015), and reestimate Equation (1) using these subsamples.

### 4.3. Test of H4

I estimate following Equation (2) to test whether multinationals make use of intercompany capital transactions for tax-motivated income shifting:

$$\begin{aligned}
 InterestExp_{it} = & \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * STRDiff_{it} \\
 & + \beta_3 LowSTRDiff_{it} * STRDiff_{it} + \beta_4 CFC_{it} + \beta_5 TE_{it} \\
 & + \beta_6 LnSales_{it} + \beta_7 Lev_{it} + \beta_8 AssetTO_{it} + \beta_9 Mlev_{it} \\
 & + \beta_{10} Mtangibility_{it} + \beta_{11} Missue_{it} + \beta_{12} Ownership_{it} \\
 & + \beta_{13} GDPGrowth_{it} + Country\ dummies \\
 & + Industry\ dummies + Year\ dummies + \varepsilon_{it}
 \end{aligned} \tag{2}$$

The dependent variable (*InterestExp*) is a subsidiary's interest expenses paid to a parent during year  $t$  scaled by total assets, which is a proxy for income shifting through intercompany capital transactions. If a parent does capital transactions with their subsidiaries as a way of income shifting across jurisdictions, it would locate debt in high-tax countries rather than in low-tax countries. As a result, subsidiaries in high corporate tax rate countries would have greater amount of interest expenses paid to their parent than those in low

corporate tax rate countries. Therefore, I predict both  $\beta_2$ , the coefficient on  $HighSTRDiff * STRDiff$ , and  $\beta_3$ , the coefficient on  $LowSTRDiff * STRDiff$ , to be positive.

In regards to controls, I include *CFC* and *TE* which may affect multinationals' incentive to shift income. A variable that represents a subsidiary's size (*LnSales*) is also included (e.g., Graham 1996; Mills and Newberry 2004). Further, I add *Lev* and *AssetTO* to control for a subsidiary's debt capacity and asset efficiency, respectively. In addition, *Mlev* and *Mtangibility* are used to control for multinationals' overall reliance on debt financing (Altshuler and Grubert 2002) and debt securability (Myers 1977; Mills and Newberry 2004), respectively. Finally, I control for multinationals' external financing (*Missue*) and percentage of shareholding for a subsidiary (*Ownership*), a subsidiary country-level growth rate (*GDPGrowth*), country-, industry- and year-fixed effects. In the regression, I estimate the standard errors by clustering them at the multinational firm and year level (Petersen 2009).

#### **4.4. Test of H5**

I employ the following regression models based on Equation (1) to examine the multinationals' use of intercompany asset transactions for tax-

motivated income shifting:<sup>18</sup>

$$\begin{aligned}
RoS_{it} = & \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * Acquire_{it} \\
& + \beta_3 HighSTRDiff_{it} * STRDiff_{it} + \beta_4 HighSTRDiff_{it} * STRDiff_{it} * Acquire_{it} \\
& + \beta_5 LowSTRDiff_{it} * STRDiff_{it} + \beta_6 LowSTRDiff_{it} * STRDiff_{it} * Acquire_{it} \\
& + \beta_7 Acquire_{it} + \beta_8 CFC_{it} + \beta_9 TE_{it} + \beta_{10} Lev_{it} + \beta_{11} AssetTO_{it} \\
& + \beta_{12} MRoS_{it} + \beta_{13} Msales_{it} + \beta_{14} Mtangibility_{it} + \beta_{15} Mintangibles_{it} \\
& + \beta_{16} Mmb_{it} + \beta_{17} MOCF_{it} + \beta_{18} Missue_{it} + \beta_{19} Ownership_{it} \\
& + \beta_{20} GDPGrowth_{it} + Country\ dummies + Industry\ dummies \\
& + Year\ dummies + \varepsilon_{it}
\end{aligned} \tag{3a}$$

$$\begin{aligned}
RoS_{it} = & \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * Transfer_{it} \\
& + \beta_3 HighSTRDiff_{it} * STRDiff_{it} + \beta_4 HighSTRDiff_{it} * STRDiff_{it} * Transfer_{it} \\
& + \beta_5 LowSTRDiff_{it} * STRDiff_{it} + \beta_6 LowSTRDiff_{it} * STRDiff_{it} * Transfer_{it} \\
& + \beta_7 Transfer_{it} + \beta_8 CFC_{it} + \beta_9 TE_{it} + \beta_{10} Lev_{it} + \beta_{11} AssetTO_{it} \\
& + \beta_{12} MRoS_{it} + \beta_{13} Msales_{it} + \beta_{14} Mtangibility_{it} + \beta_{15} Mintangibles_{it} \\
& + \beta_{16} Mmb_{it} + \beta_{17} MOCF_{it} + \beta_{18} Missue_{it} + \beta_{19} Ownership_{it} \\
& + \beta_{20} GDPGrowth_{it} + Country\ dummies + Industry\ dummies \\
& + Year\ dummies + \varepsilon_{it}
\end{aligned} \tag{3b}$$

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<sup>18</sup> I cannot divide the intercompany noncurrent asset transactions into intercompany tangible asset transactions and intercompany intangible asset transactions due to data availability. But given that 96% of sample parent firms which do asset transfer transactions with their foreign subsidiaries are in an information technology (IT) industry or a high-tech industry, most of the noncurrent asset transactions would be intangible asset transactions.

To proxy for intercompany asset transactions, I use an indicator variable of a subsidiary's acquisition of non-current assets from a parent (*Acquire*) in Equation (3a) and an indicator variable of a subsidiary's transfer of non-current assets to a parent (*Transfer*) in Equation (3b). First, in Equation (3a), if a parent transfers non-current assets to subsidiaries in low-tax countries rather than to those in high-tax countries as a means of tax planning, the coefficient on  $LowSTRDiff * STRDiff * Acquire$  ( $\beta_6$ ) would be negative and significant while that on  $HighSTRDiff * STRDiff * Acquire$  ( $\beta_4$ ) would be insignificant. Similarly, in Equation (3b), if a parent acquires non-current assets from subsidiaries in high-tax countries rather than from those in low-tax countries, the coefficient on  $LowSTRDiff * STRDiff * Transfer$  ( $\beta_6$ ) would be insignificant but that on  $HighSTRDiff * STRDiff * Transfer$  ( $\beta_4$ ) would be significantly negative.

## 5. Sample Construction and Descriptive Statistics

### 5.1. Sample Construction

To examine international income shifting by multinational firms subject to a worldwide tax regime, I begin with consolidated subsidiaries of yearly top 50 Korean public firms based on total assets during 2006-2015, resulting in 13,619 foreign subsidiary-years.<sup>19,20</sup> Table 2 provides detailed information on the

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<sup>19</sup> In principle, a sample of multinational should be chosen on the basis of the percentage of

consolidated subsidiaries of sample parents. First, Panel A shows the numbers of foreign and domestic subsidiaries in each year. They are on the rise and especially the number of foreign subsidiaries increases steadily from 730 in 2006 to 2,045 in 2015 (also see Figure 1 which presents the average numbers of foreign and domestic subsidiaries per sample parent firm by year). This indicates that multinationals' operations overseas are continuously expanding and thus the possibility that they utilize foreign subsidiaries as a way of tax-motivated income shifting is increasing as regulators' concern.

[Insert Table 2 around here]

[Insert Figure 1 around here]

The average percentage of foreign subsidiaries during the sample period, is about 74% ( $= 1,362/1,849$ ) and among the foreign subsidiaries, as shown in Panel B, about 65% ( $= 878/1,353$ ) are located in high corporate tax rate

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their foreign operations, but the data cannot be obtained from the financial databases. Accordingly, to take a multinational sample, I assume the larger firm size, the higher the percentage of the firm's foreign operations given that Korean firms are generally dependent on foreign trade, and then view yearly top 50 Korean listed firms on the basis of total assets as the rule of thumb. Prior literature also documents that large multinationals may experience tax rate efficiencies because of the scale of their operations (Rego 2003; Dyreng and Lindsey 2009).

<sup>20</sup> As a result of examining each sample firm (parent)'s percentage of foreign operations based on the number of subsidiaries, I find that it is mostly high, as predicted. I also use total assets and sales of sample parents' subsidiaries, some of which are not disclosed, to calculate it and find that the results remain similar as those before (the correlation between the percentage of foreign operations based on the number of subsidiaries and that based on total assets (sales) of subsidiaries during the sample period is 0.73 (0.75)).

countries on average.<sup>21</sup> This can be explained by Figure 2 presenting top 10 foreign countries based on the number of subsidiaries. The most number of the foreign subsidiaries are in China, followed by the U.S., Hong Kong, Germany, and Japan, most of which are high-tax countries as suggested in Table 1.<sup>22</sup>

[Insert Figure 2 around here]

Panels A and B of Table 3 presents the descriptive statistics of financial information on consolidated foreign subsidiaries of sample parents utilizing top 3 multinationals with more than 100 foreign subsidiaries based on total assets of the year 2015.<sup>23,24</sup> To be specific, the size of the foreign subsidiaries is generally large, as shown in Panel A. Especially, Panel B shows that the averages of the high-tax subsidiaries' total assets in thousand won (*Assets*) are higher than those of the low-tax subsidiaries' *Assets*. In addition, the mean values of the high-tax subsidiaries' total liabilities in thousand won (*Liabilities*) are higher than those of the low-tax subsidiaries' *Liabilities*. Similarly, the values of the high-tax subsidiaries' leverage (*Lev*) are also higher than those of the low-tax subsidiaries' *Lev* on average (untabulated). These offer preliminary evidence that multinationals use debt financing as a means of their tax planning

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<sup>21</sup> In Panel B of Table 2, subsidiary-year observations which lack data on the statutory tax rate of a subsidiary country are excluded as in Table 1.

<sup>22</sup> Figure 2 also shows the subsidiaries' number is rising in most countries, consistent with Panel A of Table 2.

<sup>23</sup> I exclude subsidiary-years which lack data on the financial information. In addition, subsidiary-year observations with the extreme value of *Assets* equal to 0, *Liabilities* less than 0, *Sales* less than 0, or *RoS* greater than 1 or less than -1 are also excluded to mitigate the outliers' effects.

<sup>24</sup> See Appendix for the definition of variables.

strategies. On the other hand, except for a B company, the mean values of the high-tax subsidiaries' pretax income in thousand won (*PreIncome*) are lower than those of the low-tax subsidiaries' *PreIncome* even though they are insignificant. Further, the averages of the high-tax subsidiaries' profitability (*RoS*) are lower than those of the low-tax subsidiaries' *RoS* (untabulated). These provide preliminary evidence that multinationals engage in tax-motivated international income shifting activities.

[Insert Table 3 around here]

I hand-collect subsidiary data from the parent firm's annual report and statutory tax rate data from OECD.Stat, *Ernst & Young Worldwide Corporate Tax Guide*, and *PricewaterhouseCoopers Worldwide Tax Summaries - Corporate Taxes*. Parent-level financial data and market capitalization data are obtained from the TS2000 database and the Korea Investors Service Value (KISVALUE), respectively. Gross Domestic Product (GDP) data are taken from the World Economic Outlook database. Then, I exclude subsidiary-year observations with insufficient data to measure my test and control variables. Continuous variables except for *STRDiff* and *TE* are winsorized at the 1% and 99% levels to alleviate the potential effects of outliers. These procedures result in a final sample of 5,236 subsidiary-years. In case of the empirical analyses of intercompany transactions using Equations (2), (3a) and (3b), the final samples consist of 1,169, 1,271 and 1,721 subsidiary-years, respectively.

## 5.2. Descriptive Statistics

Table 4 shows the descriptive statistics of variables used in the regression analysis utilizing Equation (1). The mean values of *HighSTRDiff* and *LowSTRDiff* are 0.655 and 0.345, respectively. This indicates that 65.5% (34.5%) of sample subsidiaries are incorporated in high-tax (low-tax) countries, consistent with Panel B of Table 2. In addition, the parent-level consolidated percentage ownership for each sample subsidiary is 93.4% on average, suggesting that multinationals own their foreign subsidiaries in the form of wholly-owned subsidiaries.

[Insert Table 4 around here]

Table 5 tabulates the Pearson correlations between variables in the empirical analysis using Equation (1). The profitability of subsidiaries (*RoS*) is insignificantly correlated with an indicator variable of a high-tax foreign subsidiary (*HighSTRDiff*). However, this correlation does not consider other correlated variables and key variables in the empirical analysis using Equation (1) are the interaction terms, *HighSTRDiff* \* *STRDiff* and *LowSTRDiff* \* *STRDiff*. Thus, I will provide a detailed description on the effect of multinationals' tax incentive to shift income on the profitability of their



subsidiaries in the next section of regression analysis.<sup>25</sup>

[Insert Table 5 around here]

Table 6 provides detailed information on sample subsidiaries. Panel A presents that most of them are located in China and the U.S., which is consistent with Figure 2. Meanwhile, among the sample subsidiaries, 70% are in manufacturing or wholesale and retail trade industry. Next came transportation (10%), professional, scientific and technical activities (6%) and construction (3%).

[Insert Table 6 around here]

Table 7 presents the descriptive statistics of variables in the empirical analysis using Equation (2). The mean values of the variables used in Equation (2) including *HighSTRDiff* and *LowSTRDiff* are generally consistent with those in Table 4. Table 8 shows the Pearson correlations between variables used in the regression analysis utilizing Equation (2).<sup>26</sup> Subsidiaries' interest expenses paid to their parent scaled by their total assets (*InterestExp*) is positively but insignificantly correlated with a dummy variable of high corporate tax rate foreign subsidiaries (*HighSTRDiff*). On the other hand, the untabulated results

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<sup>25</sup> In Table 5, most correlation values range from -0.3 to 0.3, which mitigates the concern about the multicollinearity problem. Further, in each regression of this paper, I find that the variance inflation factor score is less than 10, enhancing my confidence that multicollinearity does not bias my results.

<sup>26</sup> Most correlations in Table 8 are between -0.3 and 0.3, alleviating the possibility of the multicollinearity problem.

show that the correlation between *InterestExp* and *LowSTRDiff* is negative even though it is insignificant.<sup>27</sup> These would indicate that multinationals do capital transactions with their foreign subsidiaries as a means of tax-motivated income shifting. However, these are the correlations between two variables without considering other correlated variables and therefore I will do the multivariate analysis in the next section to examine the effect of the tax incentive of multinational firms on their intercompany capital transactions with foreign subsidiaries.

[Insert Table 7 around here]

[Insert Table 8 around here]

Panels A and B of Table 9 show the descriptive statistics of variables used in the regression analyses using Equations (3a) and (3b), respectively. In both Panels, the average of the variables is mostly consistent with that presented in Table 4 and any unusual distributions are not found. Panels A and B of Table 10 show the Pearson correlations between variables in the empirical analyses utilizing Equation (3a) and (3b), respectively.<sup>28</sup> The correlation between an indicator variable of subsidiaries' acquisition of non-current assets from their parent (*Acquire*) and an indicator variable of a high-tax foreign subsidiary

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<sup>27</sup> I do not report *LowSTRDiff* in the correlation matrix because the correlation coefficient values of *LowSTRDiff* are exactly the opposite from those of *HighSTRDiff*.

<sup>28</sup> In both Panels A and B of Table 10, most correlation values range from -0.3 to 0.3. This mitigates the concern on multicollinearity.

(*HighSTRDiff*) is negative in Panel A. On the contrary, in Panel B, an indicator variable of subsidiaries' transfer of non-current assets to their parent (*Transfer*) is positively correlated with *HighSTRDiff*. Although both correlation coefficients are insignificant, these may imply that, as predicted, subsidiaries in high-tax countries transfer non-current assets to their parent rather than acquire them from their parent. The opposite is true for a dummy variable of low corporate tax rate foreign subsidiaries (*LowSTRDiff*) (untabulated), which suggests that low-tax foreign subsidiaries acquire non-current assets from their parent rather than transfer to their parent as predicted.<sup>29</sup>

[Insert Table 9 around here]

[Insert Table 10 around here]

## 6. Results

### 6.1. Results of H1

To examine multinationals' parent-country inward and outward income shifting for tax savings, I estimate the regression model in Equation (1). Table

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<sup>29</sup> I also analyze the intercompany asset transactions between a parent firm and their foreign subsidiaries using the GDP growth of a parent country. The results show that parent firms mostly transfer noncurrent assets to low-tax subsidiaries in times of boom while they generally transfer noncurrent assets to high-tax subsidiaries in times of recession (untabulated). This provides preliminary evidence that multinationals transfer noncurrent assets to low-tax subsidiaries for tax-motivated income shifting.

11 presents the estimation results. The coefficient on the interaction between *LowSTRDiff* and *STRDiff* is significantly negative while that on the interaction between *HighSTRDiff* and *STRDiff* is statistically insignificant.<sup>30</sup> This indicates that the lower the statutory tax rate of a foreign country in which a low-tax foreign subsidiary is located, the more a multinational under a worldwide tax system shifts income out of a parent country to the low-tax country, consistent with my hypothesis H1(b). On the contrary, multinationals subject to a worldwide tax regime do not shift income into a parent country from high corporate tax rate countries even though they can reduce their worldwide tax burden through a parent-country inward income shifting, which may seem to be inconsistent with the finding of prior literature and my prediction. But this empirical finding would be interpreted as evidence that the multinationals utilize subsidiaries in high-tax countries mainly for business rather than tax purposes. As shown in Table 1, the statutory tax rate of Korea, a home country of sample subsidiaries, is positioned in the middle and major developed countries such as the U.S., Japan, and Germany belong to a group of high corporate tax rate.<sup>31</sup> Moreover, the high-tax foreign subsidiaries are mostly

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<sup>30</sup> I also reestimate the regression model in Equation (1) after a 95% winsorization of *RoS* to further mitigate the potential effects of outliers. In addition, I include *STRDiff* instead of *HighSTRDiff*, *HighSTRDiff* \* *STRDiff* and *LowSTRDiff* \* *STRDiff* in Equation (1), and estimate this regression model using the subsamples of high-tax and low-tax foreign subsidiaries. The (untabulated) results reveal that the previous results remain robust.

<sup>31</sup> The untabulated test for the difference between means show that the average GDP growth rate of high-tax countries in which sample subsidiaries are incorporated (0.040) is significantly lower than that of low-tax countries where sample subsidiaries are located (0.065). This suggests that developed countries generally have a higher statutory tax rate than developing countries.

incorporated in those countries as shown in Table 6. These indicate that high-tax foreign subsidiaries may be, in general, incorporated or utilized as a means of activating or expanding multinationals' business rather than tax planning strategies. Similarly, prior literature documents that non-tax environmental factors such as market potential, infrastructure investments and welfare policies rather than tax differentials between countries would be important in determining foreign direct investment (e.g., Rogowski and Tannenbaum 2006; Görg et al. 2009; Kang and Jun 2012). This insignificant effect of tax differentials that exist between countries is consistent with the Feldstein and Horioka's (1980) finding that capital mobility is low, which is called the Feldstein-Horioka puzzle (Kang 2011).<sup>32</sup> The results would also be interpreted as evidence that strong monitoring mechanisms for multinational income shifting in developed countries hinder a parent-country inward income shifting of Korean multinationals. In addition, using the subsidiary-level data to examine the directional tax-motivated income shifting of multinationals under a worldwide tax system can cause the empirical result inconsistent with prior research.

Meanwhile, other coefficients show that the profitability of foreign

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<sup>32</sup> In Korea, multinationals were allowed to choose an overall limitation or a country-by-country limitation method when calculating FTC before 2015. Thus, they could maximize FTC by choosing an overall limitation method rather than a country-by-country limitation method and adjusting the timing of repatriation from their high-tax and low-tax subsidiaries. This might reduce their incentive of engaging in a parent-country inward income shifting. But, since 2015, they have been mandated to apply a country-by-country limitation method for the calculation of FTC, which would increase the incentive of them to shift income into a parent country from high-tax countries for tax savings.

subsidiaries is negatively related to a disincentive for multinationals to defer repatriation (*CFC*) and the subsidiaries' leverage (*Lev*), and positively related to the asset turnover ratio of the subsidiaries (*AssetTO*) and parent-level consolidated size (*Msales*) and growth opportunities (*Mmtb*).

[Insert Table 11 around here]

## 6.2. Results of H2

To explore the effect of the BEPS project on multinationals' directional income shifting, I perform subsample analyses with the regression model in Equation (1). Columns (2) and (3) of Table 12 show the estimation results of using pre-BEPS and post-BEPS subsamples, respectively. First, the both coefficients on *HighSTRDiff* \* *STRDiff* and *LowSTRDiff* \* *STRDiff* are statistically insignificant in Column (2). Similarly, the coefficients on *HighSTRDiff* \* *STRDiff* and *LowSTRDiff* \* *STRDiff* are also statistically insignificant in Column (3). In addition, the difference between the coefficient on *HighSTRDiff* \* *STRDiff* in Column (2) and that in Column (3) and the difference between the coefficient on *LowSTRDiff* \* *STRDiff* in Column (2) and that in Column (3) are all insignificant (untabulated). These suggest that tax-motivated income shifting by multinationals subject to a worldwide tax regime is not affected by the BEPS package for hindering their international tax avoidance. This may be because it is not long after multinationals' response to the BEPS project and it takes time to do tax planning. The coefficients on a

number of control variables in both columns are generally consistent with those reported in Table 11 and the findings in prior studies.

[Insert Table 12 around here]

### **6.3. Results of H3**

To test whether IFRS adoption affects multinationals' tax planning through international income shifting, I estimate Equation (1) using the subsamples of pre-IFRS and post-IFRS. Columns (1) and (2) of Table 12 presents the results of the pre-IFRS and post-IFRS subsample analyses, respectively. As shown in Column (1), multinationals under a worldwide tax regime shift income out of a parent country to low-tax countries in the pre-IFRS period. In contrast, Column (2) shows that their parent-country outward income shifting becomes weak in the post-IFRS period. These imply that the adoption of IFRS does not provide benefits to multinationals subject to a worldwide tax system with the incentive to shift income for tax savings, contrary to the finding of De Simone (2016). The set of benchmark firms expanded with the IFRS adoption which enables tax authorities to enforce tighter comparability criteria for transfer prices would lead to the results. The results for the other variables in both columns are qualitatively similar to those documented in Table 11.

### **6.4. Multinationals' Use of Intercompany Transactions**

Panels A and B of Table 13 show the comparison of types of intercompany

transactions with a parent between high-tax and low-tax subsidiaries of sample parents using the raw and scaled amounts of the intercompany transactions, respectively. First, with regard to intercompany capital transactions, the average of the low-tax subsidiaries' interest expenses paid to their parent in thousand won (*InterestExp\_amount*), as predicted, is significantly lower than that of the high-tax subsidiaries' *InterestExp\_amount* in Panel A. In a similar vein, the mean value of the low-tax subsidiaries' interest revenues received from their parent in thousand won (*InterestRev\_amount*) is significantly higher than that of the high-tax subsidiaries' *InterestRev\_amount*. Especially, the average of the high-tax subsidiaries' *InterestRev\_amount* is zero. Panel B also presents the qualitatively similar results. These offer preliminary evidence that multinationals use intercompany capital transactions or debt location as one of ways to increase income in low corporate tax rate countries and decrease income in high corporate tax rate countries for reduction in their worldwide taxes.

Next, regarding intercompany asset transactions, the difference between the mean of the low-tax subsidiaries' acquisition costs of non-current assets acquired from their parent in thousand won (*Acquire\_amount*) and that of the high-tax subsidiaries' *Acquire\_amount* is insignificant in Panel A. On the other hand, the average of the low-tax subsidiaries' sales amount of non-current assets transferred to their parent in thousand won (*Transfer\_amount*) is significantly lower than that of the high-tax subsidiaries' *Transfer\_amount*. In



addition, for the low-tax foreign subsidiaries, *Transfer\_amount* is smaller than *Acquire\_amount* on average. The opposite is true for the high-tax foreign subsidiaries. In particular, the mean value of the low-tax subsidiaries' *Transfer\_amount* is very low. Panel B also shows the generally consistent results. These imply that low-tax subsidiaries primarily do asset acquisition transactions with their parent while high-tax subsidiaries mainly do asset transfer transactions with their parent. Thus, the results provide preliminary evidence that multinationals utilize intercompany asset transactions as a way of their tax planning strategies given that a firm earns revenues by making use of non-current assets.

I also analyze the types of intercompany transactions between high-tax subsidiaries and their parent and between low-tax subsidiaries and their parent utilizing only sample parents with both high-tax and low-tax foreign subsidiaries. I find that the previous results are largely unchanged, as shown in Panels C and D of Table 13.

[Insert Table 13 around here]

## **6.5. Results of H4**

To explore whether multinationals utilize intercompany capital transactions with their foreign subsidiaries as a way of tax-motivated income shifting in a multivariate analysis, I estimate the regression model in Equation (2). Table 14 presents the estimation results. The coefficient on *HighSTRDiff* \*

*STRDiff* is statistically insignificant but that on *LowSTRDiff* \* *STRDiff* is significantly positive. This implies that the lower the statutory tax rate of low-tax foreign subsidiaries, the less multinationals provide funds in the form of debt to them for tax savings, consistent with my hypothesis H4. But it does not seem that the higher the statutory tax rate of high-tax subsidiaries, the more multinationals provide funds in the form of debt to them in order to ease their worldwide tax burden. This may be because thin capitalization rules which determine how much of the interest paid on debt is deductible for tax purposes are applied to foreign subsidiaries and/or multinationals use their subsidiaries in high corporate tax rate countries for non-tax rather than tax purposes, as shown in Table 11. Meanwhile, other coefficients on control variables show that *InterestExp* is negatively related to subsidiaries' asset turnover ratio (*AssetTO*) and positively related to parent-level consolidated tangibility (*Mtangibility*).

[Insert Table 14 around here]

## 6.6. Results of H5

To examine, in a multivariate analysis, whether multinationals do intercompany asset transactions with their subsidiaries in foreign countries for international income shifting, I estimate the regression models in Equations (3a) and (3b). Columns (1) and (2) of Table 15 show the estimation results of these Equations, respectively. First, the coefficients on *HighSTRDiff* \* *STRDiff* \* *Acquire* and *LowSTRDiff* \* *STRDiff* \* *Acquire* are all statistically insignificant

in Column (1), indicating that multinationals do not utilize intercompany non-current asset transfer transactions with their foreign subsidiaries as a means of tax-motivated income shifting.

Meanwhile, the coefficient on  $LowSTRDiff * STRDiff * Transfer$  is statistically insignificant while the coefficient on  $HighSTRDiff * STRDiff * Transfer$  is significantly positive in Column (2). This suggests that high-tax foreign subsidiaries increase their profitability through the intercompany asset transfer transactions with their parent. Thus, the results would be interpreted as evidence that multinationals do not use intercompany asset acquisition transactions with their high-tax subsidiaries for tax purposes. This is consistent with the results that multinationals utilize their high-tax foreign subsidiaries mainly for business purposes, reported in Table 11. On the other hand, low-tax subsidiaries mostly do asset acquisition rather than transfer transactions with their parent, as shown in Table 13. Therefore, this would lead to the insignificant empirical result in Column (2). The coefficients on control variables in both columns are in general consistent with those in the main regression analysis reported in Table 11 and thus I omit the explanations for these variables.

[Insert Table 15 around here]

## **6.7. Additional Analyses and Robustness Tests**

In addition to the preceding analyses, I examine whether multinationals

prefer to utilize tax haven countries when shifting income for tax savings. Tax havens receive considerable attention in the financial press when international income shifting issues are handled. But there is little empirical evidence on the multinationals' use of tax havens for tax-motivated income shifting. Prior literature on tax havens also fail to find evidence that, on average, U.S. profitable firms having material operations in tax havens report lower federal tax liabilities on foreign income than U.S. firms without operations in tax havens (Dyreng and Lindsey 2009).<sup>33</sup> In addition, multinationals may be reluctant to shift income to tax havens due to regulators' a lot of concerns about tax havens. Thus, it is uncertain whether multinationals prefer tax havens to non-tax havens to ease their worldwide tax burden. To test the multinationals' use of tax havens as a means of tax-motivated income shifting, I include an indicator variable of a tax haven country (*TaxHaven*) and related interaction terms in Equation (1).<sup>34</sup> The (untabulated) results reveal that the coefficient on *LowSTRDiff \* STRDiff \* TaxHaven* is significantly negative, indicating that multinationals use tax havens more than non-tax havens for multinational income shifting. The coefficients on other variables are qualitatively similar to those reported in Table 13.<sup>35</sup>

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<sup>33</sup> This result is in contrast to regulators and policy makers' concern that tax haven countries enable them to avoid federal taxation of foreign income. This finding is also inconsistent with the theory of Desai et al. (2006) suggesting that reduced taxes of doing business in tax havens stimulate investment in adjacent high corporate tax rate countries (Dyreng and Lindsey 2009).

<sup>34</sup> I identify tax haven countries using the following sources: OECD, EU, National Tax Service, which is Korean tax authority, and Gravelle (2015).

<sup>35</sup> Most correlation values range from -0.3 to 0.3. This alleviates the possibility of the

I also investigate the effect of the CFC rule on the income shifting strategies of multinationals.<sup>36</sup> If low-tax foreign subsidiaries are subject to the CFC rule, multinationals would not have an incentive to shift income to those subsidiaries for tax purposes because repatriation taxes are levied regardless of whether profits are remitted. To test the rule's effect on multinationals' income shifting, I create a dummy variable of a low-tax subsidiary not subject to the CFC rule (*NCFC*) and add  $NCFC * STRDiff$  and  $CFC * STRDiff$  instead of  $LowSTRDiff * STRDiff$  in Equation (1). The untabulated results show that the coefficient on  $NCFC * STRDiff$  is significantly negative but that on  $CFC * STRDiff$  is also negative and significant, inconsistent with my prediction. Given that the sample size of low-tax subsidiaries subject to the CFC rule is relatively small, as shown in Table 4, the results could be due to uncontrolled firm characteristics.

Next, I explore whether a change in a parent country's statutory tax rate affects the tax-motivated income shifting activities of multinationals under a worldwide tax system. In Korea, the top statutory corporate tax rate decreased from 27.5% to 24.2% in 2009. Thus, to test the effect of the statutory tax rate change in a parent country on multinational income shifting, I create the

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multicollinearity problem.

<sup>36</sup> In Korea, the foreign firms subject to the CFC rule are those (i) located in a state or region in which the tax burden is 15% or less of the income actually earned by the firm, (ii) owned directly or indirectly 10% or more in terms of the total outstanding stocks or equity contribution by Korean persons including Korean firms, and (iii) in certain industries which generate passive income that can be easily moved across jurisdictions (e.g., wholesale, finance, insurance, or real estate), according to articles 17 and 18 of the Law for the Coordination of International Tax Affairs.

subsamples of 2006-2008 and 2009-2010, and reestimate the regression model in Equation (1) using these subsamples.<sup>37</sup> The untabulated results show that the coefficient on *HighSTRDiff* \* *STRDiff* for the subsample of 2006-2008 is not significantly different from that for the subsample of 2009-2010. In addition, the difference between the coefficient on *LowSTRDiff* \* *STRDiff* for the subsample of 2006-2008 and that for the subsample of 2009-2010 is insignificant. These indicate that tax-motivated income shifting by Korean multinationals is not affected by the change in their parent country's statutory tax rate. This may be because the global financial crisis of 2007-2008 causes the multinationals to shift income across jurisdictions for survival rather than tax purposes.

To examine the effect of the statutory corporate tax rate change in a sample foreign country on international income shifting, I also identify the sample foreign countries which are reclassified into a different group during the sample period when using the difference between their statutory tax rate and a domestic statutory tax rate (i.e., those reclassified from a high-tax country group to a low-tax country group and vice versa). Then, I exclude the sample of 2011-2015 to eliminate the possibility of the effect of IFRS adoption on the multinationals' tax-motivated income shifting. But due to a lack of observations in the post-Reclassification subsamples, I cannot do the analysis.

Furthermore, I examine the effect of tax audits on multinationals' cross-

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<sup>37</sup> I do not use the sample of 2011-2015 to rule out the possibility of the effects of IFRS adoption on the multinationals' income shifting strategies for tax savings.

jurisdictional income shifting behaviors. First, I identify sample parents which face tax penalties as a result of a tax audit during the sample period through the Financial Supervisory Service's electronic disclosure system and news articles on the Internet.<sup>38</sup> Then, I create the subsamples of pre-TaxAudit and post-TaxAudit using the sample parents, and reestimate Equation (1) using these subsamples. I find that the coefficient on *LowSTRDiff* \* *STRDiff* for the pre-TaxAudit subsample is significantly negative but that for the post-TaxAudit subsample is significantly positive (untabulated). This implies that multinationals under a worldwide tax system do not shift income out of a parent country to low-tax foreign countries after receiving tax penalties resulting from a tax investigation. Rather, they shift income into a parent country from low-tax foreign countries in the post-TaxAudit period. Hence, this finding would be interpreted as evidence that tax audits leading to tax penalties work to curb tax-motivated income shifting by multinationals subject to a worldwide tax regime. Multinationals facing considerable tax penalties as a result of a tax investigation receive significant attention from the tax authority and interested parties. In addition, Dyreng et al. (2015) find that public pressure from outside activist groups leads scrutinized large listed firms to decrease tax avoidance. Accordingly, they would decide not to engage in international income shifting for tax savings in consideration of any possible negative consequences such as

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<sup>38</sup> In Korea, according to Disclosure Regulations in Securities Markets, listed firms should report the fact that they become subject to a penalty or fine the magnitude of which exceeds a certain percentage of their total equity immediately to the Securities Exchange when they come to know it.

a big disadvantage for future tax audits and significant reputational costs.<sup>39</sup> In contrast, the coefficient on *HighSTRDiff* \* *STRDiff* for both subsamples is insignificant.

Meanwhile, multinationals can ease their worldwide tax burden through the transfer pricing of sale and purchase transactions with their foreign subsidiaries, which are the most common type of intercompany profit and loss transactions.<sup>40</sup> Thus, I additionally explore how multinationals utilize intercompany profit and loss transactions for international income shifting by estimating following Equations (4a) and (4b) based on Equation (1):

$$\begin{aligned}
RoS_{it} = & \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * Purchase_{it} \\
& + \beta_3 HighSTRDiff_{it} * STRDiff_{it} + \beta_4 HighSTRDiff_{it} * STRDiff_{it} * Purchase_{it} \\
& + \beta_5 LowSTRDiff_{it} * STRDiff_{it} + \beta_6 LowSTRDiff_{it} * STRDiff_{it} * Purchase_{it} \\
& + \beta_7 Purchase_{it} + \beta_8 CFC_{it} + \beta_9 TE_{it} + \beta_{10} Lev_{it} + \beta_{11} AssetTO_{it} \\
& + \beta_{12} MRoS_{it} + \beta_{13} Msales_{it} + \beta_{14} Mtangibility_{it} + \beta_{15} Mintangibles_{it} \\
& + \beta_{16} Mmtb_{it} + \beta_{17} MOCF_{it} + \beta_{18} Missue_{it} + \beta_{19} Ownership_{it} \\
& + \beta_{20} GDPGrowth_{it} + Country\ dummies + Industry\ dummies \\
& + Year\ dummies + \varepsilon_{it}
\end{aligned} \tag{4a}$$

$$RoS_{it} = \beta_0 + \beta_1 HighSTRDiff_{it} + \beta_2 HighSTRDiff_{it} * Sale_{it}$$

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<sup>39</sup> In Korea, large public firms are generally subject to a tax investigation every four or five year (e.g., Business Watch, 7 June, 2017, available from <http://www.bizwatch.co.kr/pages/view.php?uid=31358>).

<sup>40</sup> Other intercompany profit and loss transactions include transactions that generate fee income/expenses such as royalty and sales commission, processing costs paid to subcontractor, and rent.



$$\begin{aligned}
& + \beta_3 \text{HighSTRDiff}_{it} * \text{STRDiff}_{it} + \beta_4 \text{HighSTRDiff}_{it} * \text{STRDiff}_{it} * \text{Sale}_{it} \\
& + \beta_5 \text{LowSTRDiff}_{it} * \text{STRDiff}_{it} + \beta_6 \text{LowSTRDiff}_{it} * \text{STRDiff}_{it} * \text{Sale}_{it} \\
& + \beta_7 \text{Sale}_{it} + \beta_8 \text{CFC}_{it} + \beta_9 \text{TE}_{it} + \beta_{10} \text{Lev}_{it} + \beta_{11} \text{AssetTO}_{it} \\
& + \beta_{12} \text{MRoS}_{it} + \beta_{13} \text{Msales}_{it} + \beta_{14} \text{Mtangibility}_{it} + \beta_{15} \text{Mintangibles}_{it} \\
& + \beta_{16} \text{Mmtb}_{it} + \beta_{17} \text{MOCF}_{it} + \beta_{18} \text{Missue}_{it} + \beta_{19} \text{Ownership}_{it} \\
& + \beta_{20} \text{GDPGrowth}_{it} + \text{Country dummies} + \text{Industry dummies} \\
& + \text{Year dummies} + \varepsilon_{it}
\end{aligned} \tag{4b}$$

As proxies for intercompany profit and loss transactions, I employ variables that represent a subsidiary's purchases from a parent (*Purchase*) in Equation (4a) and its sales to a parent (*Sale*) in Equation (4b).<sup>41</sup> If multinationals make use of sale and purchase transactions between foreign subsidiaries and their parent for international tax avoidance, three-way interaction terms in these regression models, *HighSTRDiff \* STRDiff \* Purchase*, *LowSTRDiff \* STRDiff \* Purchase*, *HighSTRDiff \* STRDiff \* Sale* and *LowSTRDiff \* STRDiff \* Sale*, would have negative coefficients.

Panels A and B of Table 16 present the descriptive statistics of variables in the empirical analyses using Equations (4a) and (4b), respectively. The mean value of *Purchase* is 0.480 in Panel A and that of *Sale* is 0.105 in Panel B. This indicates that subsidiaries do profit and loss transactions with their parent through purchase rather than sale. The distributions of the other variables in

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<sup>41</sup> I assume that the larger the transaction volume, the more multinationals use transfer prices as a way of tax-motivated income shifting (Jacob 1996).

both Panels are generally consistent with those in Table 4. In Table 17, Panels A and B show the Pearson correlations between variables used in the regression analyses utilizing Equations (4a) and (4b), respectively.<sup>42</sup> While *Purchase* is insignificantly correlated with *HighSTRDiff*, as shown in Panel A, *Sale* is significantly and positively correlated with *HighSTRDiff*, as shown in Panel B. In contrast, *Purchase* is insignificantly correlated with *LowSTRDiff* but *Sale* is negatively correlated with *LowSTRDiff* (untabulated). These correlation coefficients imply that high-tax (low-tax) foreign subsidiaries do more sale (purchase) transactions than purchase (sale) transactions with their parent. Therefore, it would be interpreted as evidence that multinationals mainly use intercompany purchase (sale) transactions rather than intercompany sale (purchase) transactions with their high-tax (low-tax) subsidiaries to reduce their worldwide taxes.

[Insert Table 16 around here]

[Insert Table 17 around here]

Meanwhile, the untabulated results reveal that the mean value of the low-tax subsidiaries' purchases from their parent (*Purchase\_amount*) is significantly lower than that of the high-tax subsidiaries' *Purchase\_amount*. On the contrary, the low-tax subsidiaries' sales to their parent (*Sale\_amount*) are, on average,

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<sup>42</sup> Most correlations are between -0.3 and 0.3 in both Panels A and B of Table 17, which alleviates the likelihood of the multicollinearity problem.

insignificantly different from the high-tax subsidiaries' *Sale\_amount*. However, these are inconsistent with the results using the amount of the intercompany profit and loss transactions scaled by subsidiary-level total assets. This is because the average of the low-tax subsidiaries' *Sale* is significantly lower than that of the high-tax subsidiaries' *Sale* while the mean difference of *Purchase* between the high-tax and low-tax subsidiaries is insignificant, indicating that low-tax subsidiaries do less sale transactions with their parent than high-tax subsidiaries. These imply that considering the size of subsidiaries would be especially crucial for analyzing intercompany profit and loss transactions between foreign subsidiaries and their parent. Finally, for both the low-tax and high-tax foreign subsidiaries, the average of *Purchase\_amount* (*Purchase*) is larger than that of *Sale\_amount* (*Sale*), suggesting that foreign subsidiaries mainly do purchase transactions rather than do sale transactions with their parent. These offer preliminary evidence that multinationals make use of intercompany profit and loss transactions, especially intercompany sale transactions with their subsidiaries as a way of their tax planning strategies.

Columns (1) and (2) of Table 18 present the results from estimating these Equations, respectively. First, in Column (1), the both coefficients on *HighSTRDiff* \* *STRDiff* \* *Purchase* and *LowSTRDiff* \* *STRDiff* \* *Purchase* are statistically insignificant. Similarly, the coefficients on *HighSTRDiff* \* *STRDiff* \* *Sale* and *LowSTRDiff* \* *STRDiff* \* *Sale* are also statistically insignificant in Column (2). These results may seem to conflict with policy makers and

regulators' concern that intercompany profit and loss transactions are utilized to ease the worldwide taxes of multinationals. But, the empirical analyses are not performed on the basis of the information on transfer prices, which may lead to the insignificant results. Hence, the results of intercompany profit and loss transactions reported in Table 18 should be interpreted with caution. Finally, control variables in both columns generally have the coefficient consistent with those in Table 11.

[Insert Table 18 around here]

I then conduct several sensitivity analyses in order to make sure the robustness of my findings as follows. First, I examine an alternative measure of *RoS*. Given that multinationals under a worldwide tax system can reduce their worldwide taxes by shifting income out of a parent to low-tax subsidiaries and deferring repatriation of the subsidiaries' profit, a parent's deferred tax liabilities which reflect its low-tax subsidiaries' profit not repatriated would be a better proxy for multinationals' tax-motivated income shifting than the profitability of a subsidiary.<sup>43</sup> Therefore, I create *DTL*, parent-level deferred tax liabilities scaled by lagged total assets in excess of the industry-year mean value of deferred tax liabilities.<sup>44</sup> Since repatriation taxes can be deferred only

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<sup>43</sup> In U.S., multinationals can avoid recording the deferred taxes if they designate their foreign subsidiaries' earnings as permanently reinvested under Accounting Principles Board (APB) Opinion No. 23 (Klassen and Laplante 2012b ; Choi 2016).

<sup>44</sup> This is based on the assumption that if low-tax foreign subsidiaries not subject to the CFC rule do not defer repatriation of their profits, their parent' deferred tax liabilities scaled by lagged total assets would be similar to the industry-year mean of deferred tax liabilities.

if low-tax foreign subsidiaries are not subject to the CFC rule, I use low-tax subsidiaries not subject to the CFC rule of multinationals which mostly have low-tax subsidiaries when using *DTL* as a proxy for income shifting.

Table 19 shows the results from reexamining subsidiaries' profit and loss transactions with their parent using *DTL*.<sup>45</sup> Specifically, Columns (1) and (2) (Columns (3) and (4)) report Pearson correlation coefficients between *DTL* and main variables used in the empirical analysis of subsidiaries' purchase transactions with their parent (subsidiaries' sale transactions with their parent). In addition, Columns (1) and (3) (Columns (2) and (4)) use multinationals with the ratio of the number of low-tax foreign subsidiaries to the total number of foreign subsidiaries (*LParent*) greater than or equal to 0.7 (0.9).<sup>46</sup> The correlation between *DTL* and *STRDiff \* Purchase* is significantly negative in both Columns (1) and (2). On the other hand, the correlation between *DTL* and *STRDiff \* Sale* is statistically insignificant in Columns (3) and (4). These indicate that the lower the statutory tax rate of low-tax foreign subsidiaries, the more multinationals shift income out of a parent country to low-tax countries through intercompany sale transactions with their subsidiaries to ease their worldwide tax burden.

[Insert Table 19 around here]

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<sup>45</sup> Due to the lack of data, I cannot reexamine subsidiaries' intercompany asset transactions with their parent utilizing *DTL*.

<sup>46</sup> The findings also remain largely unchanged when using *LParent* greater than or equal to 0.8 and *LParent* equal to 1 (untabulated).

Second, since multinationals would consider foreign countries' withholding tax rate as well as statutory corporate tax rate when they engage in decision making about international income shifting strategies, I redefine *STRDiff* by using both statutory corporate tax rate and withholding tax rate (limited tax rate) on dividend income of each country.<sup>47</sup> Third, I restrict high-tax subsidiaries to those with *STRDiff* more than or equal to 5% to examine whether multinationals shift income into a parent country from high-tax foreign countries when their tax incentive to shift income is relatively high. Fourth, I add an industry growth rate of a subsidiary country instead of a subsidiary country's overall rate of economic growth in the regression model.<sup>48</sup> Fifth, I reestimate Equation (1) after excluding multinationals with a relatively low percentage of foreign subsidiaries (10%, 20%, 30%, 40%, or 50%) because those multinationals would bias my results. Finally, I redefine the pre-IFRS period as 2009-2010 and the post-BEPS period as 2013-2015 including the year in which the BEPS package was released. These (untabulated) results are qualitatively similar to those previously tabulated.

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<sup>47</sup> The data on foreign countries' withholding tax rate (limited tax rate) on dividend income is obtained from Korea Institute of Public Finance's report published in March 2017 and I exclude observations which have no data.

<sup>48</sup> I obtain data on a subsidiary country's industry-specific GDP from OECD.Stat and do not use the industry-level GDP figures which are calculated using a group of several industries.

## 7. Conclusion

I investigate the tax-motivated income shifting activities of multinationals subject to a worldwide tax regime by using subsidiary-level data of Korean multinationals. I find that the lower the statutory tax rate of foreign countries in which low-tax subsidiaries are incorporated, the more multinationals under a worldwide tax system shift income out of a parent country to the low-tax foreign countries. This suggests that the multinationals use low-tax foreign subsidiaries to ease their worldwide taxes. I also find that the parent-country outward income shifting has decreased after IFRS adoption. However, the parent-country outward income shifting is not affected by the BEPS project. In addition, I show that multinationals subject to a worldwide tax regime make use of intercompany capital transactions with their subsidiaries as a way of multinational income shifting.

My empirical results are subject to limitations. To be specific, I only use the observations of consolidated foreign subsidiaries of large Korean multinational firms, and thus the results could not be generalizable to other countries. However, my results should be of significant interest to regulators, policymakers, academics, managers, investors, and other interested parties. Given that no prior research investigates the directional tax-motivated income shifting by multinationals under a worldwide tax system at the subsidiary level, this paper provides valuable insights. Future research may extend my results and add to the research on international income shifting and on intercompany

transactions by using the subsidiary-specific data of multinationals subject to a worldwide tax regime in other countries, data on the life cycle of the foreign investment, data on an average tax rate, transfer pricing data, and/or a longer post-BEPS period.



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# Appendix

## Variable Definitions

Variable	Definition
<i>RoS</i>	= Subsidiary-level pre-tax income divided by sales;
<i>STRDiff</i>	= The applicable statutory tax rate in a subsidiary <i>i</i> 's country minus the applicable statutory tax rate in a parent's country;
<i>HighSTRDiff</i>	= An indicator variable equal to 1 if the value of <i>STRDiff</i> is greater than 0, and 0 otherwise;
<i>LowSTRDiff</i>	= An indicator variable equal to 1 if the value of <i>STRDiff</i> is less than or equal to 0, and 0 otherwise;
<i>CFC</i>	= An indicator variable equal to 1 if a subsidiary <i>i</i> is (i) in a country which statutory tax rate is less than or equal to 15% and (ii) in the industry specified in article 18 of the Korean Law for the Coordination of International Tax Affairs, and 0 otherwise;
<i>TE</i>	= A measure of executives' assessment of the strength of tax enforcement in their country, which is from the Global Competitiveness Report 2001/2002 (available at <a href="http://scholar.harvard.edu/files/shleifer/files/tax_data_march2009.xls">http://scholar.harvard.edu/files/shleifer/files/tax_data_march2009.xls</a> );
<i>Assets</i>	= Subsidiary-level total assets in thousand won;
<i>Liabilities</i>	= Subsidiary-level total liabilities in thousand won;
<i>Sale</i>	= Subsidiary-level sales in thousand won;
<i>PreIncome</i>	= Subsidiary-level pre-tax income in thousand won;
<i>Lev</i>	= Subsidiary-level total liabilities divided by total assets;
<i>AssetTO</i>	= Subsidiary-level asset turnover ratio, calculated as sales divided by total assets;
<i>MRoS</i>	= Parent-level consolidated pre-tax income divided by consolidated sales;
<i>Msales</i>	= Natural log of parent-level consolidated sales in thousand won;
<i>Mtangibility</i>	= Parent-level consolidated tangible assets scaled by consolidated total assets;
<i>Mintangibles</i>	= Parent-level consolidated intangible assets scaled by consolidated sales;

<i>Mmtb</i>	= Parent-level consolidated market value of equity divided by consolidated book value of equity;
<i>MOCF</i>	= Parent-level consolidated operating cash flows scaled by consolidated total assets;
<i>Missue</i>	= Parent-level consolidated external financing during year <i>t</i> scaled by consolidated lagged total assets;
<i>Ownership</i>	= Parent-level consolidated percentage ownership for subsidiary <i>i</i> ;
<i>GDPGrowth</i>	= The percent change of gross domestic product;
<i>BEPS</i>	= An indicator variable equal to 1 if a subsidiary-year is in the period after which the Base Erosion and Profit Shifting (BEPS) package was released, and 0 otherwise;
<i>IFRS</i>	= An indicator variable equal to 1 if financial statements are prepared by using International Financial Reporting Standards (IFRS), and 0 otherwise;
<i>InterestExp_amount</i>	= Subsidiary-level interest expenses paid to a parent during year <i>t</i> in thousand won;
<i>InterestRev_amount</i>	= Subsidiary-level interest revenues received from a parent during year <i>t</i> in thousand won;
<i>Acquire_amount</i>	= Subsidiary-level acquisition costs of non-current assets acquired from a parent during year <i>t</i> in thousand won;
<i>Transfer_amount</i>	= Subsidiary-level sales amount of non-current assets transferred to a parent during year <i>t</i> in thousand won;
<i>Purchase_amount</i>	= Subsidiary-level purchases from a parent during year <i>t</i> in thousand won;
<i>Sale_amount</i>	= Subsidiary-level sales to a parent during year <i>t</i> in thousand won;
<i>InterestExp</i>	= Subsidiary-level interest expenses paid to a parent during year <i>t</i> scaled by total assets;
<i>LnSales</i>	= Natural log of subsidiary-level sales in thousand won;
<i>Mlev</i>	= Parent-level consolidated total liabilities divided by total assets;
<i>Acquire</i>	= An indicator variable equal to 1 if a subsidiary <i>i</i>



	acquires non-current assets from a parent during year $t$ , and 0 otherwise;
<i>Transfer</i>	= An indicator variable equal to 1 if a subsidiary $i$ transfers non-current assets to a parent during year $t$ , and 0 otherwise;
<i>Purchase</i>	= Subsidiary-level purchases from a parent during year $t$ scaled by total assets;
<i>Sale</i>	= Subsidiary-level sales to a parent during year $t$ scaled by total assets;
<i>DTL</i>	= Parent-level deferred tax liabilities scaled by lagged total assets in excess of the industry-year mean value of deferred tax liabilities;
<i>LParent</i>	= The ratio of the number of low-tax foreign subsidiaries to the total number of foreign subsidiaries of a parent.

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**Table 1**  
**A Statutory Tax Rate by Country where Consolidated Subsidiaries of**  
**Sample Parents are Located in 2015**

Country	STR (%)	Country	STR (%)
India	43.26	Malaysia	25.00
United States of America	39.00	Mongolia	25.00
France	38.00	The Republic of the Union of Myanmar	25.00
Argentina	35.00	Barbados	25.00
Brazil	34.00	Austria	25.00
Colombia	34.00	Uruguay	25.00
Belgium	33.99	Indonesia	25.00
Pakistan	33.00	China	25.00
Japan	32.11	Panama	25.00
Mozambique	32.00	Republic of Korea	24.20
Italy	31.29	Libya	24.00
Germany	30.18	Denmark	23.50
Nigeria	30.00	Algeria	23.00
Rwanda	30.00	Chile	22.50
Mexico	30.00	Vietnam	22.00
Morocco	30.00	Sweden	22.00
Angola	30.00	Slovak Republic	22.00
Egypt	30.00	Ecuador	22.00
Kenya	30.00	Switzerland	21.15
Costa Rica	30.00	Russia	20.00
Papua New Guinea	30.00	Saudi Arabia	20.00
Peru	30.00	Azerbaijan	20.00
Philippines	30.00	United Kingdom	20.00
Australia	30.00	Kazakhstan	20.00
Portugal	29.50	Cambodia	20.00
Luxembourg	29.22	Thailand	20.00
Republic of South Africa	28.00	Turkey	20.00
New Zealand	28.00	Finland	20.00
Spain	28.00	Czech	19.00
Norway	27.00	Poland	19.00
Samoa	27.00	Hungary	19.00
Canada	26.70	Ukraine	18.00
Israel	26.50	Taiwan	17.00
Greece	26.00	Slovenia	17.00
Guatemala	25.00	Singapore	17.00
Netherlands	25.00	Hong Kong	16.50

*(Continued on next page)*

**Table 1 (continued)**

Country	STR (%)	Country	STR (%)
Romania	16.00	Bulgaria	10.00
Latvia	15.00	Bahrain	0.00
Lebanon	15.00	Bermuda	0.00
Mauritius	15.00	British Virgin Islands	0.00
Uzbekistan	14.90	United Arab Emirates	0.00
Jordan	14.00	Cayman Islands	0.00
Cyprus	12.50		
Ireland	12.50	Average	23.13
Oman	12.00	Std. Dev.	8.64

This table presents a statutory tax rate (STR) by country in which consolidated subsidiaries of sample parents are incorporated in 2015. STR (%) refers to the STR in percentage terms.

**Table 2**  
**Distribution of Consolidated Subsidiaries of Sample Parents**

**Panel A: Distribution of Subsidiaries by Location and Year**

Location	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	Mean
Foreign country	730	799	964	1,088	1,118	1,514	1,666	1,796	1,899	2,045	13,619	1,362
Domestic country	374	370	428	430	468	530	540	568	582	578	4,868	487
Total	1,104	1,169	1,392	1,518	1,586	2,044	2,206	2,364	2,481	2,623	18,487	1,849

**Panel B: Distribution of Subsidiaries by Foreign Country Based on a Statutory Tax Rate and Year**

Foreign country based on a statutory tax rate	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	Mean
High-tax country	385	389	448	581	604	838	1,269	1,371	1,399	1,494	8,778	878
Low-tax country	345	409	515	504	502	657	381	417	489	531	4,750	475
Total	730	798	963	1,085	1,106	1,495	1,650	1,788	1,888	2,025	13,528	1,353

Panel A shows the distribution of consolidated subsidiaries of sample parents by location and year. Panel B shows the distribution of consolidated subsidiaries of sample parents by foreign country based on a statutory tax rate and year. A foreign country is classified into a high-tax (low-tax) country group when its statutory tax rate is greater than (less than or equal to) that of a domestic country.

**Table 3**

**Descriptive Statistics of Financial Information on Consolidated Foreign Subsidiaries of Sample Parents**

**Panel A: Summary Statistics**

Variable	Obs.	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<b>A Company</b>								
<i>Assets</i>	197	2,699,207,492	2,579,392,084	122,489,000	1,207,723,000	1,619,844,000	3,114,334,000	14,875,687,000
<i>Liabilities</i>	197	1,539,772,081	1,573,255,578	7,058,000	664,256,000	1,082,420,000	1,679,893,000	11,040,055,000
<i>Sales</i>	197	7,355,286,665	5,877,698,322	18,892,000	3,136,402,000	5,394,509,000	10,584,827,000	35,766,374,000
<i>PreIncome</i>	197	252,959,981	489,312,355	-468,688,066	36,614,290	103,692,500	249,232,857	4,116,336,000
<b>B Company</b>								
<i>Assets</i>	154	2,081,880,344	5,025,269,927	9,622,000	167,762,000	518,972,000	1,622,619,000	37,447,867,000
<i>Liabilities</i>	154	1,609,520,247	4,530,825,313	13,824,000	92,368,000	423,212,500	1,133,387,000	34,533,886,000
<i>Sales</i>	154	2,593,098,968	3,527,441,543	11,622,000	204,900,000	1,207,967,000	3,742,285,000	17,106,517,000
<i>PreIncome</i>	154	98,042,544	198,966,192	-266,914,200	380,690	9,730,263	100,402,985	813,142,575
<b>C Company</b>								
<i>Assets</i>	770	159,261,347	319,307,404	26,000	16,429,000	62,924,500	150,079,000	4,259,257,000
<i>Liabilities</i>	770	113,807,627	249,866,847	0	10,013,000	45,671,500	102,240,000	3,818,369,000
<i>Sales</i>	770	210,477,009	438,718,328	17,000	15,299,000	73,203,500	187,325,000	3,561,754,000
<i>PreIncome</i>	770	-875,309	34,194,270	-563,320,000	-1,834,667	300,675	2,328,750	189,624,286

*(Continued on next page)*

**Table 3 (continued)**

**Panel B: A Comparison between High-Tax and Low-Tax Subsidiaries**

Variable	(1) High-Tax Subsidiaries		(2) Low-Tax Subsidiaries		Diff (= (1) - (2))	
	Obs.	Mean	Obs.	Mean	Mean	
<b>A Company</b>						
<i>Assets</i>	115	3,443,529,061	82	1,655,341,878	1,788,187,183	***
<i>Liabilities</i>	115	1,998,552,991	82	896,359,829	1,102,193,162	***
<i>Sales</i>	115	8,813,393,809	82	5,310,380,305	3,503,013,504	***
<i>PreIncome</i>	115	245,422,208	82	263,531,247	-18,109,039	
<b>B Company</b>						
<i>Assets</i>	97	2,889,312,732	57	707,828,737	2,181,483,995	***
<i>Liabilities</i>	97	2,287,633,227	57	455,538,509	1,832,094,718	**
<i>Sales</i>	97	3,304,372,825	57	1,382,685,561	1,921,687,264	***
<i>PreIncome</i>	97	123,900,954	57	54,037,882	69,863,072	**
<b>C Company</b>						
<i>Assets</i>	550	160,265,282	220	156,751,509	3,513,773	
<i>Liabilities</i>	550	115,854,431	220	108,690,618	7,163,813	
<i>Sales</i>	550	189,152,624	220	263,787,973	-74,635,349	**
<i>PreIncome</i>	550	-1,271,941	220	116,273	-1,388,214	

Panel A shows summary statistics for financial information on consolidated foreign subsidiaries of sample parents using top 3 multinationals with more than 100 foreign subsidiaries based on total assets of the year 2015. Panel B shows the comparison of the financial information between high-tax and low-tax subsidiaries. A foreign subsidiary is classified into a high-tax (low-tax) subsidiary group when the statutory tax rate of a country where it is incorporated is greater than (less than or equal to) that of a parent country.

See Appendix for the definition of variables. \*, \*\*, and \*\*\* indicate the difference between the mean of the variable for high-tax subsidiaries and that of the variable for low-tax subsidiaries is significant at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 4**  
**Descriptive Statistics (Obs. = 5,236)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>RoS</i>	0.011	0.190	-0.747	-0.016	0.012	0.061	0.662
<i>STRDiff</i>	0.024	0.079	-0.175	-0.022	0.008	0.060	0.191
<i>HighSTRDiff</i>	0.655	0.476	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.345	0.476	0.000	0.000	0.000	1.000	1.000
<i>CFC</i>	0.007	0.081	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.693	1.205	1.900	3.000	3.000	4.700	6.300
<i>Lev</i>	0.642	0.352	0.005	0.415	0.656	0.858	2.109
<i>AssetTO</i>	2.204	2.391	0.033	0.705	1.515	2.716	14.302
<i>MROs</i>	0.045	0.069	-0.129	0.010	0.032	0.079	0.295
<i>Msales</i>	23.797	0.981	21.879	23.015	23.737	24.766	26.027
<i>Mtangibility</i>	0.368	0.168	0.048	0.245	0.385	0.469	0.807
<i>Mintangibles</i>	0.066	0.101	-0.006	0.015	0.032	0.078	0.603
<i>Mmtb</i>	1.040	0.619	0.167	0.661	0.885	1.258	3.471
<i>MOCF</i>	0.061	0.062	-0.070	0.022	0.051	0.095	0.259
<i>Missue</i>	0.053	0.203	-0.202	-0.018	0.014	0.063	1.499
<i>Ownership</i>	0.934	0.143	0.483	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.048	0.038	-0.048	0.020	0.048	0.078	0.142

This table presents summary statistics for variables used in this study. The sample consists of 5,236 subsidiary-years during the period 2006-2015. All the continuous variables except for *STRDiff* and *TE* are winsorized at the 1st percentile and 99th percentile. See Appendix for the definition of variables.



**Table 5**  
**Correlation Matrix (Obs. = 5,236)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) <i>RoS</i>	1.00													
(2) <i>HighSTRDiff</i>	-0.02	1.00												
(3) <i>CFC</i>	0.00	<b>-0.11</b>	1.00											
(4) <i>TE</i>	0.00	0.00	<b>-0.04</b>	1.00										
(5) <i>Lev</i>	<b>-0.24</b>	<b>0.07</b>	<b>-0.03</b>	<b>0.05</b>	1.00									
(6) <i>AssetTO</i>	0.00	<b>-0.06</b>	-0.01	<b>0.22</b>	<b>0.23</b>	1.00								
(7) <i>MROs</i>	<b>0.05</b>	<b>-0.07</b>	<b>0.03</b>	<b>-0.04</b>	<b>-0.03</b>	0.01	1.00							
(8) <i>Msales</i>	<b>0.04</b>	<b>0.03</b>	<b>-0.03</b>	<b>-0.03</b>	<b>0.04</b>	<b>0.11</b>	<b>0.11</b>	1.00						
(9) <i>Mtangibility</i>	<b>0.05</b>	-0.02	<b>0.04</b>	<b>0.03</b>	<b>-0.05</b>	<b>0.07</b>	<b>-0.18</b>	<b>-0.09</b>	1.00					
(10) <i>Mintangibles</i>	<b>-0.03</b>	<b>0.08</b>	-0.01	0.00	0.00	<b>-0.09</b>	<b>-0.12</b>	<b>-0.11</b>	<b>-0.18</b>	1.00				
(11) <i>Mmtb</i>	<b>0.04</b>	<b>-0.12</b>	<b>0.09</b>	-0.01	-0.01	0.00	<b>0.22</b>	<b>-0.24</b>	0.01	<b>-0.16</b>	1.00			
(12) <i>MOCF</i>	<b>0.04</b>	<b>-0.07</b>	<b>0.06</b>	0.01	-0.01	<b>0.12</b>	<b>0.43</b>	<b>0.24</b>	<b>0.26</b>	<b>-0.18</b>	<b>0.20</b>	1.00		
(13) <i>Missue</i>	0.01	<b>-0.04</b>	0.01	0.02	0.01	<b>-0.03</b>	<b>0.19</b>	<b>-0.09</b>	<b>-0.15</b>	<b>0.21</b>	0.00	<b>-0.24</b>	1.00	
(14) <i>Ownership</i>	-0.01	<b>0.05</b>	-0.01	<b>0.16</b>	<b>0.07</b>	<b>0.13</b>	0.01	<b>-0.04</b>	<b>-0.03</b>	<b>0.05</b>	0.02	0.00	0.01	1.00
(15) <i>GDPGrowth</i>	0.02	<b>-0.31</b>	<b>0.15</b>	<b>-0.37</b>	<b>-0.12</b>	<b>-0.09</b>	<b>0.08</b>	<b>-0.05</b>	<b>0.05</b>	<b>-0.09</b>	<b>0.05</b>	<b>0.02</b>	0.00	<b>-0.15</b>

This table presents Pearson correlation coefficients for variables used in this study. I bold the coefficients which indicate significance at  $p \leq 0.10$ . See Appendix for the definition of variables.

**Table 6**  
**Distribution of Sample Subsidiaries**

**Panel A: Distribution of Subsidiary-Years by Country**

Country	Obs.	Obs. (%)
China	1,681	32%
United States of America	633	12%
Japan	245	5%
Vietnam	203	4%
Germany	194	4%
India	194	4%
Singapore	180	3%
Indonesia	178	3%
Australia	158	3%
Hong Kong	153	3%
United Kingdom	139	3%
Others	1,278	24%
Total	5,236	100%

**Panel B: Distribution of Subsidiary-Years by Industry**

Industry	Obs.	Obs. (%)
Manufacturing	1,999	38%
Wholesale and Retail Trade	1,653	32%
Transportation	539	10%
Professional, Scientific and Technical Activities	299	6%
Construction	157	3%
Mining and Quarrying	142	3%
Information and Communications	131	3%
Real Estate Activities and Renting and Leasing	81	2%
Electricity, Gas, Steam and Water Supply	80	2%
Financial and Insurance Activities	71	1%
Accommodation and Food Service Activities	43	1%
Others	41	1%
Total	5,236	100%

Panel A shows the distribution of sample subsidiary-years by country. Panel B shows the distribution of sample subsidiary-years by industry classified using the one-digit of Korea Standard Industry Code.

**Table 7**  
**Descriptive Statistics for Variables Used in the Empirical Analysis of**  
**Intercompany Capital Transactions (Obs. = 1,169)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>InterestExp</i>	0.000	0.002	0.000	0.000	0.000	0.000	0.037
<i>STRDiff</i>	0.025	0.080	-0.150	-0.022	0.008	0.079	0.191
<i>HighSTRDiff</i>	0.656	0.475	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.344	0.475	0.000	0.000	0.000	1.000	1.000
<i>CFC</i>	0.015	0.123	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.873	1.237	1.900	3.000	3.400	5.200	6.300
<i>LnSales</i>	17.628	2.117	13.034	16.101	17.462	19.227	22.648
<i>Lev</i>	0.628	0.466	0.006	0.333	0.629	0.846	3.686
<i>AssetTO</i>	2.157	2.421	0.049	0.670	1.430	2.590	14.302
<i>Mlev</i>	0.608	0.198	0.236	0.465	0.645	0.730	0.953
<i>Mtangibility</i>	0.374	0.189	0.062	0.208	0.359	0.486	0.779
<i>Missue</i>	0.025	0.103	-0.202	-0.029	0.012	0.072	0.371
<i>Ownership</i>	0.941	0.146	0.480	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.048	0.040	-0.043	0.018	0.047	0.078	0.142

This table presents summary statistics for variables used in the empirical analysis of sample subsidiaries' intercompany capital transactions with their parent. The sample consists of 1,169 subsidiary-years during the period 2006-2015. All the continuous variables except for *STRDiff* and *TE* are winsorized at the 1st percentile and 99th percentile. See Appendix for the definition of variables.

**Table 8**  
**Correlation Matrix for Variables Used in the Empirical Analysis of**  
**Intercompany Capital Transactions (Obs. = 1,169)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>InterestExp</i>	1.00										
(2) <i>HighSTRDiff</i>	0.04	1.00									
(3) <i>CFC</i>	0.00	<b>-0.17</b>	1.00								
(4) <i>TE</i>	<b>0.05</b>	<b>-0.06</b>	<b>-0.07</b>	1.00							
(5) <i>LnSales</i>	0.00	-0.01	0.02	<b>0.22</b>	1.00						
(6) <i>Lev</i>	0.00	<b>0.14</b>	<b>-0.07</b>	<b>0.13</b>	<b>0.14</b>	1.00					
(7) <i>AssetTO</i>	<b>-0.05</b>	-0.02	-0.04	<b>0.24</b>	<b>0.33</b>	<b>0.27</b>	1.00				
(8) <i>Mlev</i>	0.03	<b>-0.06</b>	-0.05	0.01	<b>-0.10</b>	0.04	0.00	1.00			
(9) <i>Mtangibility</i>	<b>0.06</b>	<b>-0.18</b>	<b>0.05</b>	<b>0.08</b>	<b>-0.11</b>	<b>-0.08</b>	0.04	<b>0.36</b>	1.00		
(10) <i>Missue</i>	0.03	-0.02	<b>0.05</b>	0.03	0.04	0.03	<b>-0.06</b>	<b>-0.09</b>	<b>-0.08</b>	1.00	
(11) <i>Ownership</i>	0.03	<b>0.06</b>	-0.05	<b>0.07</b>	0.04	<b>0.05</b>	<b>0.13</b>	-0.02	-0.03	<b>-0.05</b>	1.00
(12) <i>GDPGrowth</i>	-0.03	<b>-0.39</b>	<b>0.19</b>	<b>-0.39</b>	<b>-0.05</b>	<b>-0.17</b>	<b>-0.13</b>	<b>-0.10</b>	0.00	0.02	<b>-0.12</b>

This table presents Pearson correlation coefficients for variables used in the empirical analysis of sample subsidiaries' intercompany capital transactions with their parent. I bold the coefficients which indicate significance at  $p \leq 0.10$ . See Appendix for the definition of variables.

**Table 9**  
**Descriptive Statistics for Variables Used in the Empirical Analysis of**  
**Intercompany Asset Transactions**

**Panel A: A Subsidiary's Acquisition of Noncurrent Assets from a Parent**  
**(Obs. = 1,271)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>RoS</i>	0.016	0.182	-0.721	-0.008	0.017	0.071	0.631
<i>STRDiff</i>	0.025	0.080	-0.150	-0.025	0.008	0.079	0.191
<i>HighSTRDiff</i>	0.655	0.475	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.345	0.475	0.000	0.000	0.000	1.000	1.000
<i>Acquire</i>	0.048	0.214	0.000	0.000	0.000	0.000	1.000
<i>CFC</i>	0.014	0.118	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.871	1.236	1.900	3.000	3.400	5.200	6.300
<i>Lev</i>	0.622	0.454	0.006	0.328	0.621	0.836	3.667
<i>AssetTO</i>	2.216	2.389	0.049	0.691	1.486	2.721	14.027
<i>MROs</i>	0.043	0.087	-0.167	0.005	0.031	0.104	0.339
<i>Msales</i>	23.567	1.217	21.785	22.685	23.032	24.686	26.156
<i>Mtangibility</i>	0.374	0.183	0.062	0.236	0.357	0.481	0.779
<i>Mintangibles</i>	0.046	0.056	-0.005	0.013	0.026	0.064	0.361
<i>Mmtb</i>	1.124	0.799	0.160	0.558	0.920	1.508	4.036
<i>MOCF</i>	0.059	0.069	-0.093	0.017	0.053	0.086	0.262
<i>Missue</i>	0.023	0.100	-0.202	-0.027	0.008	0.054	0.367
<i>Ownership</i>	0.943	0.143	0.480	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.047	0.039	-0.043	0.018	0.047	0.078	0.142

*(Continued on next page)*

**Table 9 (continued)****Panel B: A Subsidiary's Transfer of Noncurrent Assets to a Parent (Obs. = 1,721)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>RoS</i>	-0.001	0.184	-0.753	-0.019	0.013	0.056	0.618
<i>STRDiff</i>	0.025	0.080	-0.150	-0.032	0.008	0.079	0.191
<i>HighSTRDiff</i>	0.667	0.471	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.333	0.471	0.000	0.000	0.000	1.000	1.000
<i>Transfer</i>	0.023	0.151	0.000	0.000	0.000	0.000	1.000
<i>CFC</i>	0.010	0.099	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.759	1.216	1.900	3.000	3.000	4.800	6.300
<i>Lev</i>	0.642	0.373	0.010	0.414	0.654	0.847	2.597
<i>AssetTO</i>	2.149	2.322	0.039	0.679	1.434	2.649	13.455
<i>MROs</i>	0.051	0.081	-0.167	0.010	0.036	0.097	0.339
<i>Msales</i>	23.697	1.155	21.824	22.786	23.563	24.713	26.156
<i>Mtangibility</i>	0.361	0.159	0.077	0.255	0.359	0.468	0.770
<i>Mintangibles</i>	0.047	0.065	-0.004	0.014	0.023	0.061	0.379
<i>Mmtb</i>	0.992	0.672	0.160	0.541	0.878	1.169	3.683
<i>MOCF</i>	0.063	0.064	-0.070	0.022	0.054	0.095	0.226
<i>Missue</i>	0.031	0.090	-0.175	-0.011	0.012	0.052	0.367
<i>Ownership</i>	0.939	0.140	0.500	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.049	0.038	-0.043	0.019	0.047	0.078	0.142

This table presents summary statistics for variables used in the empirical analysis of sample subsidiaries' intercompany asset transactions with their parent. The samples of a subsidiary's acquisition of noncurrent assets from a parent in Panel A and its transfer of noncurrent assets to a parent in Panel B consist of 1,271 and 1,721 subsidiary-years during the period 2006-2015, respectively. All the continuous variables except for *STRDiff* and *TE* are winsorized at the 1st percentile and 99th percentile. See Appendix for the definition of variables.

**Table 10**

**Correlation Matrix for Variables Used in the Empirical Analysis of Intercompany Asset Transactions**

**Panel A: A Subsidiary's Acquisition of Noncurrent Assets from a Parent (Obs. = 1,271)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>RoS</i>	1.00														
(2) <i>HighSTRDiff</i>	-0.01	1.00													
(3) <i>Acquire</i>	0.05	-0.02	1.00												
(4) <i>CFC</i>	-0.02	<b>-0.17</b>	-0.03	1.00											
(5) <i>TE</i>	0.00	<b>-0.07</b>	-0.02	<b>-0.07</b>	1.00										
(6) <i>Lev</i>	<b>-0.14</b>	<b>0.14</b>	-0.04	<b>-0.07</b>	<b>0.12</b>	1.00									
(7) <i>AssetTO</i>	-0.02	-0.01	<b>0.05</b>	<b>-0.05</b>	<b>0.21</b>	<b>0.27</b>	1.00								
(8) <i>MROs</i>	0.03	-0.04	<b>0.12</b>	<b>0.05</b>	0.00	-0.03	0.04	1.00							
(9) <i>Msales</i>	0.04	0.01	<b>0.12</b>	<b>-0.07</b>	<b>0.09</b>	-0.03	<b>0.18</b>	<b>0.14</b>	1.00						
(10) <i>Mtangibility</i>	<b>0.10</b>	<b>-0.17</b>	<b>0.05</b>	<b>0.05</b>	<b>0.09</b>	<b>-0.06</b>	0.04	<b>-0.30</b>	<b>-0.13</b>	1.00					
(11) <i>Mintangibles</i>	-0.04	<b>0.05</b>	0.04	0.01	<b>0.09</b>	0.00	-0.03	<b>-0.14</b>	<b>0.05</b>	<b>-0.19</b>	1.00				
(12) <i>Mmtb</i>	0.03	<b>-0.09</b>	0.04	<b>0.13</b>	<b>-0.07</b>	-0.01	-0.04	<b>0.06</b>	<b>-0.26</b>	<b>0.13</b>	<b>-0.21</b>	1.00			
(13) <i>MOCF</i>	<b>0.05</b>	<b>-0.08</b>	<b>0.25</b>	<b>0.05</b>	<b>0.08</b>	-0.01	<b>0.15</b>	<b>0.53</b>	<b>0.39</b>	<b>0.12</b>	-0.02	<b>0.08</b>	1.00		
(14) <i>Missue</i>	0.02	-0.02	0.04	<b>0.05</b>	0.03	0.03	<b>-0.07</b>	-0.01	<b>-0.12</b>	<b>-0.08</b>	<b>0.28</b>	<b>-0.07</b>	<b>-0.21</b>	1.00	
(15) <i>Ownership</i>	-0.01	<b>0.05</b>	0.02	<b>-0.05</b>	<b>0.08</b>	<b>0.05</b>	<b>0.13</b>	<b>0.06</b>	<b>0.07</b>	-0.02	-0.04	0.03	<b>0.08</b>	<b>-0.05</b>	1.00
(16) <i>GDPGrowth</i>	<b>0.07</b>	<b>-0.35</b>	0.03	<b>0.19</b>	<b>-0.38</b>	<b>-0.17</b>	<b>-0.13</b>	<b>0.14</b>	<b>-0.10</b>	0.00	<b>-0.14</b>	0.04	0.01	0.03	<b>-0.13</b>

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**Table 10 (continued)**

**Panel B: A Subsidiary's Transfer of Noncurrent Assets to a Parent (Obs. = 1,721)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>RoS</i>	1.00														
(2) <i>HighSTRDiff</i>	-0.02	1.00													
(3) <i>Transfer</i>	<b>0.04</b>	0.04	1.00												
(4) <i>CFC</i>	-0.01	<b>-0.14</b>	-0.02	1.00											
(5) <i>TE</i>	-0.01	-0.03	-0.01	<b>-0.05</b>	1.00										
(6) <i>Lev</i>	<b>-0.22</b>	<b>0.15</b>	-0.03	<b>-0.06</b>	<b>0.09</b>	1.00									
(7) <i>AssetTO</i>	<b>0.05</b>	<b>-0.04</b>	0.03	-0.02	<b>0.20</b>	<b>0.27</b>	1.00								
(8) <i>MROs</i>	<b>0.07</b>	<b>-0.05</b>	<b>0.08</b>	0.02	-0.02	<b>-0.06</b>	0.00	1.00							
(9) <i>Msales</i>	<b>0.05</b>	0.02	<b>0.18</b>	<b>-0.08</b>	<b>0.05</b>	<b>0.04</b>	<b>0.18</b>	0.00	1.00						
(10) <i>Mtangibility</i>	<b>0.09</b>	<b>-0.08</b>	<b>0.06</b>	0.02	0.02	-0.03	<b>0.10</b>	<b>-0.18</b>	<b>-0.04</b>	1.00					
(11) <i>Mintangibles</i>	<b>-0.06</b>	-0.02	-0.02	0.01	<b>0.08</b>	0.00	<b>-0.08</b>	<b>-0.19</b>	0.02	<b>-0.09</b>	1.00				
(12) <i>Mmtb</i>	0.00	<b>-0.10</b>	0.03	<b>0.16</b>	<b>-0.08</b>	0.02	-0.03	<b>0.31</b>	<b>-0.22</b>	<b>0.07</b>	<b>-0.22</b>	1.00			
(13) <i>MOCF</i>	<b>0.08</b>	<b>-0.04</b>	<b>0.20</b>	0.02	<b>0.04</b>	-0.01	<b>0.15</b>	<b>0.48</b>	<b>0.31</b>	<b>0.25</b>	<b>-0.09</b>	<b>0.24</b>	1.00		
(14) <i>Missue</i>	-0.01	<b>-0.06</b>	<b>-0.05</b>	<b>0.05</b>	0.01	0.01	<b>-0.08</b>	-0.01	<b>-0.07</b>	<b>-0.15</b>	<b>0.22</b>	<b>-0.07</b>	<b>-0.20</b>	1.00	
(15) <i>Ownership</i>	-0.01	0.02	<b>0.04</b>	<b>-0.04</b>	<b>0.15</b>	<b>0.07</b>	<b>0.13</b>	0.03	0.03	0.02	0.02	-0.03	0.03	-0.01	1.00
(16) <i>GDPGrowth</i>	<b>0.06</b>	<b>-0.29</b>	<b>-0.05</b>	<b>0.17</b>	<b>-0.41</b>	<b>-0.14</b>	<b>-0.11</b>	<b>0.08</b>	<b>-0.10</b>	0.04	<b>-0.12</b>	<b>0.10</b>	-0.01	0.03	<b>-0.17</b>

Panel A presents Pearson correlation coefficients for variables used in the empirical analysis of sample subsidiaries' acquisition of noncurrent assets from their parent. Panel B presents Pearson correlation coefficients for variables used in the empirical analysis of sample subsidiaries' transfer of noncurrent assets to their parent. I bold the coefficients which indicate significance at  $p \leq 0.10$ . See Appendix for the definition of variables.



**Table 11**  
**Tax-Motivated Income Shifting Regression**

Variable	Dep. Var. = <i>RoS</i>	
	Coeff.	t-stat.
Intercept	-0.214	-1.206
<i>HighSTRDiff</i>	0.017 **	2.201
<i>HighSTRDiff</i> * <i>STRDiff</i>	0.239	1.059
<i>LowSTRDiff</i> * <i>STRDiff</i>	-0.052 ***	-3.788
<i>CFC</i>	-0.045 *	-1.747
<i>TE</i>	0.004	0.192
<i>Lev</i>	-0.131 ***	-8.950
<i>AssetTO</i>	0.003 *	1.777
<i>MROs</i>	0.072	0.899
<i>Msales</i>	0.008 *	1.684
<i>Mtangibility</i>	0.028	0.646
<i>Mintangibles</i>	-0.008	-0.125
<i>Mmtb</i>	0.013 *	1.811
<i>MOCF</i>	0.067	0.862
<i>Missue</i>	0.014	1.307
<i>Ownership</i>	0.000	0.234
<i>GDPGrowth</i>	0.002	0.915
<i>Country dummies</i>	Included	
<i>Industry dummies</i>	Included	
<i>Year dummies</i>	Included	
Obs.	5,236	
Adjusted R <sup>2</sup>	0.113	

This table presents the results from estimating Equation (1). See Appendix for the definition of variables. Standard errors are clustered by multinational firm and year. \*, \*\*, and \*\*\* denote significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 12**  
**The Effect of the BEPS Project and IFRS Adoption on Tax-Motivated Income Shifting**

Variable	Dep. Var. = <i>RoS</i>					
	(1) Pre-IFRS		(2) Post-IFRS/Pre-BEPS		(3) Post-BEPS	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	0.139	1.175	-0.383	-1.274	-0.255	-0.828
<i>HighSTRDiff</i>	0.069 **	1.990	0.016	0.718	0.069	0.334
<i>HighSTRDiff</i> * <i>STRDiff</i>	0.170	0.512	-0.142	-0.179	-0.570	-1.414
<i>LowSTRDiff</i> * <i>STRDiff</i>	-0.171 **	-2.037	0.387	0.616	-0.210	-0.052
<i>CFC</i>	-0.034 **	-2.113	-	-	-	-
<i>TE</i>	0.017	1.398	0.008	0.284	-0.032	-0.724
<i>Lev</i>	-0.122 ***	-5.784	-0.112 ***	-5.597	-0.177 ***	-7.950
<i>AssetTO</i>	0.005	1.234	0.003	1.231	0.001	0.295
<i>MROs</i>	0.121	1.112	0.156	1.353	-0.001	-0.014
<i>Msales</i>	-0.003	-0.943	0.019 ***	3.246	0.008	1.175
<i>Mtangibility</i>	-0.079	-1.091	0.133 **	2.657	0.026	0.472
<i>Mintangibles</i>	-0.232 ***	-3.360	0.062	1.137	0.019	0.257
<i>Mmtb</i>	0.002	0.237	0.028 ***	3.395	0.020 *	1.924
<i>MOCF</i>	0.152	1.540	-0.180	-1.302	0.163	1.020
<i>Missue</i>	0.111 ***	3.490	0.019	0.496	0.004	0.209
<i>Ownership</i>	-0.001 *	-1.826	0.000	1.249	0.001	1.585
<i>GDPGrowth</i>	0.002	0.891	-0.002	-0.561	-0.010	-1.651
<i>Country dummies</i>	Included		Included		Included	
<i>Industry dummies</i>	Included		Included		Included	

<i>Year dummies</i>	Included	Included	Included
Obs.	1,537	2,161	1,538
Adjusted R <sup>2</sup>	0.116	0.113	0.144

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Columns (1), (2) and (3) report the results from estimating Equation (1) using subsamples based on *IFRS* and *BEPS*, pre-IFRS, post-IFRS/pre-BEPS and post-BEPS subsamples, respectively. See Appendix for the definition of variables. Standard errors are clustered by multinational firm and year. For post-IFRS/pre-BEPS and post-BEPS subsample analyses, standard errors are clustered by multinational firm. \*, \*\*, and \*\*\* denote significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 13**  
**A Comparison of Types of Intercompany Transactions with a Parent**  
**between High-Tax and Low-Tax Subsidiaries of Sample Parents**

**Panel A: A Subsidiary's Intercompany Transactions with a Parent (Raw Amount)**

Variable	(1) High-Tax Subsidiaries		(2) Low-Tax Subsidiaries		Diff (= (1) - (2))	
	Obs.	Mean	Obs.	Mean	Mean	
<i>InterestExp_amount</i>	1,831	396,467	1,021	35,745	360,722	*
<i>InterestRev_amount</i>	1,920	0	1,133	11,173	-11,173	***
<i>Acquire_amount</i>	1,871	404,757	1,047	378,703	26,054	
<i>Transfer_amount</i>	2,489	972,832	1,351	2,934	969,898	*

**Panel B: A Subsidiary's Intercompany Transactions with a Parent (Scaled Amount)**

Variable	(1) High-Tax Subsidiaries		(2) Low-Tax Subsidiaries		Diff (= (1) - (2))	
	Obs.	Mean	Obs.	Mean	Mean	
<i>InterestExp</i>	1,017	0.0020	600	0.0017	0.0003	
<i>InterestRev</i>	1,120	0.0000	685	0.0005	-0.0005	***
<i>Acquire</i>	1,087	0.0020	626	0.0013	0.0007	
<i>Transfer</i>	1,478	0.0027	823	0.0000	0.0027	

*(Continued on next page)*

**Table 13 (continued)**

**Panel C: A Subsidiary's Intercompany Transactions with a Parent Having High- and Low-Tax Subsidiaries (Raw Amount)**

Variable	(1) High-Tax Subsidiaries		(2) Low-Tax Subsidiaries		Diff (= (1) - (2))	
	Obs.	Mean	Obs.	Mean	Mean	
<i>InterestExp_amount</i>	1,783	406,860	977	37,355	369,505	*
<i>InterestRev_amount</i>	1,901	0	1,089	11,625	-11,625	***
<i>Acquire_amount</i>	1,821	415,870	1,003	395,316	20,554	
<i>Transfer_amount</i>	2,461	983,900	1,302	3,045	980,856	*

**Panel D: A Subsidiary's Intercompany Transactions with a Parent Having High- and Low-Tax Subsidiaries (Scaled Amount)**

Variable	(1) High-Tax Subsidiaries		(2) Low-Tax Subsidiaries		Diff (= (1) - (2))	
	Obs.	Mean	Obs.	Mean	Mean	
<i>InterestExp</i>	969	0.0014	558	0.0018	-0.0004	
<i>InterestRev</i>	1,101	0.0000	643	0.0005	-0.0005	***
<i>Acquire</i>	1,037	0.0020	584	0.0014	0.0007	
<i>Transfer</i>	1,450	0.0027	776	0.0000	0.0027	

This table shows the comparison of types of intercompany transactions with a parent between high-tax and low-tax subsidiaries of sample parents. Panels A and B (Panels C and D) use the raw and scaled amounts of the subsidiaries' intercompany transactions with their parent (having both high-tax and low-tax subsidiaries), respectively. See Appendix for the definition of variables. \*, \*\*, and \*\*\* indicate the difference between the mean of the variable for high-tax subsidiaries and that of the variable for low-tax subsidiaries is significant at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 14**

**Intercompany Capital Transactions for Tax-Motivated Income Shifting**

Variable	Dep. Var. = <i>InterestExp</i>	
	Coeff.	t-stat.
Intercept	0.004	1.425
<i>HighSTRDiff</i>	-0.000	-1.476
<i>HighSTRDiff</i> * <i>STRDiff</i>	-0.007	-0.763
<i>LowSTRDiff</i> * <i>STRDiff</i>	0.005 **	2.218
<i>CFC</i>	-0.000	-1.329
<i>TE</i>	0.000	0.889
<i>LnSales</i>	0.000	0.728
<i>Lev</i>	0.000	0.594
<i>AssetTO</i>	-0.000 *	-1.847
<i>Mlev</i>	-0.000	-0.232
<i>Mtangibility</i>	0.001 **	2.401
<i>Missue</i>	0.001	1.453
<i>Ownership</i>	0.000	0.553
<i>GDPGrowth</i>	-0.000	-0.875
<i>Country dummies</i>	Included	
<i>Industry dummies</i>	Included	
<i>Year dummies</i>	Included	
Obs.	1,169	
Adjusted R <sup>2</sup>	0.127	

This table shows the results from estimating Equation (2). See Appendix for the definition of variables. Standard errors are clustered by multinational firm and year. \*, \*\*, and \*\*\* denote significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 15****Intercompany Asset Transactions for Tax-Motivated Income Shifting**

Variable	Dep. Var. = <i>RoS</i>			
	(1) <i>AT = Acquire</i>		(2) <i>AT = Transfer</i>	
	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	0.257	0.887	-0.258	-1.104
<i>HighSTRDiff</i>	0.007	0.193	0.032	1.611
<i>HighSTRDiff * AT</i>	0.028	0.647	-0.008	-0.269
<i>HighSTRDiff * STRDiff</i>	-0.301	-0.798	-0.184	-0.831
<i>HighSTRDiff * STRDiff * AT</i>	-0.291	-1.363	0.289 **	2.070
<i>LowSTRDiff * STRDiff</i>	0.244	0.624	-0.269 *	-1.661
<i>LowSTRDiff * STRDiff * AT</i>	0.451	0.750	-0.096	-0.193
<i>AT</i>	0.028	0.700	0.000	0.020
<i>CFC</i>	-0.083	-1.591	-0.061 *	-1.911
<i>TE</i>	-0.076 *	-1.757	0.002	0.223
<i>Lev</i>	-0.053 ***	-5.669	-0.130 ***	-5.686
<i>AssetTO</i>	-0.004	-1.093	0.005	1.426
<i>MROs</i>	0.162	1.387	0.063	0.703
<i>Msales</i>	0.010	1.462	0.012 *	1.934
<i>Mtangibility</i>	0.118 **	2.364	0.103 *	1.735
<i>Mintangibles</i>	-0.024	-0.105	-0.122	-0.813
<i>Mmtb</i>	-0.001	-0.087	0.004	0.369
<i>MOCF</i>	-0.002	-0.013	0.037	0.267
<i>Missue</i>	0.067 **	1.993	0.078	0.982
<i>Ownership</i>	-0.001	-0.677	-0.000	-0.075
<i>GDPGrowth</i>	0.005	1.157	0.000	0.016
<i>Country dummies</i>	Included		Included	
<i>Industry dummies</i>	Included		Included	
<i>Year dummies</i>	Included		Included	
Obs.	1,271		1,721	
Adjusted R <sup>2</sup>	0.136		0.186	

Columns (1) and (2) report the results from estimating Equations (3a) and (3b), respectively. See Appendix for the definition of variables. Standard errors are clustered by multinational firm and year. \*, \*\*, and \*\*\* denote significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 16**  
**Descriptive Statistics for Variables Used in the Empirical Analysis of**  
**Intercompany Profit and Loss Transactions**

**Panel A: A Subsidiary's Purchases from a Parent (Obs. = 1,568)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>RoS</i>	0.005	0.172	-0.721	-0.017	0.016	0.063	0.522
<i>STRDiff</i>	0.027	0.081	-0.150	-0.024	0.008	0.098	0.191
<i>HighSTRDiff</i>	0.669	0.471	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.331	0.471	0.000	0.000	0.000	1.000	1.000
<i>Purchase</i>	0.480	1.099	0.000	0.000	0.000	0.339	6.476
<i>CFC</i>	0.012	0.109	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.818	1.224	1.900	3.000	3.100	5.200	6.300
<i>Lev</i>	0.653	0.457	0.007	0.389	0.646	0.854	3.605
<i>AssetTO</i>	2.114	2.233	0.042	0.688	1.456	2.619	13.535
<i>MROs</i>	0.041	0.081	-0.167	0.005	0.031	0.084	0.339
<i>Msales</i>	23.452	1.060	21.759	22.664	23.082	24.380	25.508
<i>Mtangibility</i>	0.364	0.177	0.062	0.236	0.348	0.473	0.779
<i>Mintangibles</i>	0.051	0.064	-0.005	0.013	0.032	0.067	0.379
<i>Mmtb</i>	1.058	0.764	0.160	0.549	0.891	1.286	3.962
<i>MOCF</i>	0.051	0.060	-0.093	0.015	0.046	0.073	0.259
<i>Missue</i>	0.029	0.101	-0.202	-0.018	0.019	0.073	0.443
<i>Ownership</i>	0.946	0.138	0.500	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.046	0.039	-0.048	0.018	0.040	0.076	0.142

*(Continued on next page)*



**Table 16 (continued)****Panel B: A Subsidiary's Sales to a Parent (Obs. = 1,667)**

Variable	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
<i>RoS</i>	0.000	0.169	-0.721	-0.019	0.013	0.050	0.608
<i>STRDiff</i>	0.026	0.080	-0.150	-0.025	0.008	0.079	0.191
<i>HighSTRDiff</i>	0.674	0.469	0.000	0.000	1.000	1.000	1.000
<i>LowSTRDiff</i>	0.326	0.469	0.000	0.000	0.000	1.000	1.000
<i>Sale</i>	0.105	0.389	0.000	0.000	0.000	0.001	2.876
<i>CFC</i>	0.008	0.091	0.000	0.000	0.000	0.000	1.000
<i>TE</i>	3.745	1.212	1.900	3.000	3.000	4.800	6.300
<i>Lev</i>	0.660	0.337	0.012	0.453	0.673	0.860	1.944
<i>AssetTO</i>	2.146	2.208	0.039	0.740	1.520	2.667	13.442
<i>MROs</i>	0.048	0.081	-0.167	0.009	0.032	0.088	0.352
<i>Msales</i>	23.591	1.070	21.785	22.758	23.490	24.654	25.508
<i>Mtangibility</i>	0.350	0.163	0.069	0.236	0.345	0.451	0.770
<i>Mintangibles</i>	0.048	0.059	-0.005	0.014	0.028	0.064	0.379
<i>Mmtb</i>	1.014	0.707	0.160	0.546	0.878	1.169	3.945
<i>MOCF</i>	0.055	0.059	-0.093	0.019	0.050	0.082	0.226
<i>Missue</i>	0.031	0.093	-0.196	-0.011	0.015	0.065	0.443
<i>Ownership</i>	0.939	0.140	0.500	1.000	1.000	1.000	1.000
<i>GDPGrowth</i>	0.047	0.039	-0.048	0.018	0.045	0.078	0.142

This table presents summary statistics for variables used in the empirical analysis of sample subsidiaries' intercompany profit and loss transactions with their parent. The samples of a subsidiary's purchases from a parent in Panel A and its sales to a parent in Panel B consist of 1,568 and 1,667 subsidiary-years during the period 2006-2015, respectively. All the continuous variables except for *STRDiff* and *TE* are winsorized at the 1st percentile and 99th percentile. See Appendix for the definition of variables.

Table 17

Correlation Matrix for Variables Used in the Empirical Analysis of Intercompany Profit and Loss Transactions

Panel A: A Subsidiary's Purchases from a Parent (Obs. = 1,568)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>RoS</i>	1.00														
(2) <i>HighSTRDiff</i>	-0.01	1.00													
(3) <i>Purchase</i>	0.00	0.00	1.00												
(4) <i>CFC</i>	-0.02	<b>-0.16</b>	-0.01	1.00											
(5) <i>TE</i>	-0.01	-0.02	<b>0.13</b>	<b>-0.06</b>	1.00										
(6) <i>Lev</i>	<b>-0.17</b>	<b>0.13</b>	<b>0.19</b>	<b>-0.06</b>	<b>0.11</b>	1.00									
(7) <i>AssetTO</i>	0.02	-0.02	<b>0.42</b>	-0.03	<b>0.22</b>	<b>0.26</b>	1.00								
(8) <i>MRoS</i>	0.03	-0.02	<b>0.05</b>	<b>0.05</b>	-0.02	-0.03	0.01	1.00							
(9) <i>Msales</i>	-0.03	0.02	0.03	<b>-0.05</b>	<b>0.08</b>	<b>0.07</b>	<b>0.16</b>	<b>-0.05</b>	1.00						
(10) <i>Mtangibility</i>	<b>0.09</b>	<b>-0.15</b>	0.00	<b>0.05</b>	<b>0.05</b>	<b>-0.07</b>	0.01	<b>-0.29</b>	<b>-0.18</b>	1.00					
(11) <i>Mintangibles</i>	<b>-0.06</b>	<b>0.05</b>	0.03	0.00	<b>0.07</b>	<b>0.04</b>	<b>-0.07</b>	<b>-0.16</b>	<b>0.12</b>	<b>-0.13</b>	1.00				
(12) <i>Mmtb</i>	<b>0.05</b>	<b>-0.09</b>	<b>0.05</b>	<b>0.12</b>	<b>-0.06</b>	-0.03	-0.02	<b>0.05</b>	<b>-0.33</b>	<b>0.13</b>	<b>-0.22</b>	1.00			
(13) <i>MOCF</i>	0.02	<b>-0.07</b>	<b>0.17</b>	<b>0.06</b>	<b>0.06</b>	0.01	<b>0.12</b>	<b>0.44</b>	<b>0.16</b>	<b>0.15</b>	0.00	<b>0.08</b>	1.00		
(14) <i>Missue</i>	0.01	-0.01	-0.02	<b>0.05</b>	0.02	0.04	<b>-0.08</b>	0.01	<b>-0.09</b>	<b>-0.07</b>	<b>0.28</b>	<b>-0.08</b>	<b>-0.24</b>	1.00	
(15) <i>Ownership</i>	0.00	<b>0.09</b>	<b>0.13</b>	<b>-0.05</b>	<b>0.08</b>	<b>0.05</b>	<b>0.12</b>	<b>0.05</b>	0.03	-0.02	0.00	0.00	<b>0.06</b>	-0.03	1.00
(16) <i>GDPGrowth</i>	<b>0.07</b>	<b>-0.30</b>	<b>-0.07</b>	<b>0.19</b>	<b>-0.37</b>	<b>-0.18</b>	<b>-0.14</b>	<b>0.13</b>	<b>-0.11</b>	0.03	<b>-0.11</b>	<b>0.04</b>	0.01	0.03	<b>-0.14</b>

(Continued on next page)

**Table 17 (continued)**

**Panel B: A Subsidiary's Sales to a Parent (Obs. = 1,667)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) <i>RoS</i>	1.00														
(2) <i>HighSTRDiff</i>	-0.01	1.00													
(3) <i>Sale</i>	0.02	<b>0.04</b>	1.00												
(4) <i>CFC</i>	-0.02	<b>-0.13</b>	-0.02	1.00											
(5) <i>TE</i>	0.00	0.00	<b>0.08</b>	<b>-0.04</b>	1.00										
(6) <i>Lev</i>	<b>-0.23</b>	<b>0.13</b>	0.01	<b>-0.06</b>	<b>0.09</b>	1.00									
(7) <i>AssetTO</i>	<b>0.05</b>	-0.04	<b>0.15</b>	-0.01	<b>0.20</b>	<b>0.24</b>	1.00								
(8) <i>MROs</i>	<b>0.05</b>	-0.04	<b>-0.06</b>	0.01	-0.02	<b>-0.04</b>	-0.02	1.00							
(9) <i>Msales</i>	0.03	0.00	<b>-0.12</b>	<b>-0.05</b>	<b>0.07</b>	<b>0.08</b>	<b>0.17</b>	<b>-0.10</b>	1.00						
(10) <i>Mtangibility</i>	<b>0.07</b>	<b>-0.13</b>	0.04	<b>0.04</b>	0.02	<b>-0.09</b>	0.03	<b>-0.17</b>	<b>-0.09</b>	1.00					
(11) <i>Mintangibles</i>	-0.02	<b>0.04</b>	<b>0.07</b>	0.03	<b>0.08</b>	0.04	<b>-0.06</b>	<b>-0.19</b>	<b>0.06</b>	<b>-0.09</b>	1.00				
(12) <i>Mmtb</i>	-0.01	<b>-0.10</b>	<b>0.07</b>	<b>0.17</b>	<b>-0.09</b>	0.02	-0.03	<b>0.26</b>	<b>-0.29</b>	0.02	<b>-0.21</b>	1.00			
(13) <i>MOCF</i>	<b>0.07</b>	<b>-0.07</b>	<b>-0.06</b>	0.03	0.02	0.01	<b>0.11</b>	<b>0.46</b>	<b>0.17</b>	<b>0.20</b>	<b>-0.08</b>	<b>0.20</b>	1.00		
(14) <i>Missue</i>	0.02	<b>-0.06</b>	0.03	<b>0.04</b>	0.02	0.01	<b>-0.09</b>	0.02	<b>-0.09</b>	-0.02	<b>0.29</b>	<b>-0.07</b>	<b>-0.23</b>	1.00	
(15) <i>Ownership</i>	-0.01	<b>0.05</b>	0.02	<b>-0.06</b>	<b>0.15</b>	<b>0.10</b>	<b>0.14</b>	0.00	0.01	0.01	0.01	-0.03	0.00	-0.01	1.00
(16) <i>GDPGrowth</i>	<b>0.04</b>	<b>-0.31</b>	-0.01	<b>0.14</b>	<b>-0.38</b>	<b>-0.17</b>	<b>-0.10</b>	<b>0.08</b>	<b>-0.09</b>	<b>0.06</b>	<b>-0.12</b>	<b>0.09</b>	0.00	<b>0.04</b>	<b>-0.18</b>

Panel A presents Pearson correlation coefficients for variables used in the empirical analysis of sample subsidiaries' purchases from their parent. Panel B presents Pearson correlation coefficients for variables used in the empirical analysis of sample subsidiaries' sales to their parent. I bold the coefficients which indicate significance at  $p \leq 0.10$ . See Appendix for the definition of variables.

**Table 18**  
**Intercompany Profit and Loss Transactions for**  
**Tax-Motivated Income Shifting**

Variable	Dep. Var. = <i>RoS</i>			
	(1) <i>PLT = Purchase</i>		(2) <i>PLT = Sale</i>	
	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	0.678	1.204	-0.029	-0.119
<i>HighSTRDiff</i>	0.004	0.121	0.038	1.594
<i>HighSTRDiff</i> * <i>PLT</i>	0.001	0.065	-0.027	-0.540
<i>HighSTRDiff</i> * <i>STRDiff</i>	-0.263	-0.695	-0.197	-1.395
<i>HighSTRDiff</i> * <i>STRDiff</i> * <i>PLT</i>	0.014	0.205	-0.181	-0.872
<i>LowSTRDiff</i> * <i>STRDiff</i>	0.193	0.602	-0.347	*
<i>LowSTRDiff</i> * <i>STRDiff</i> * <i>PLT</i>	0.007	0.056	0.060	0.091
<i>PLT</i>	0.003	0.356	0.038	0.805
<i>CFC</i>	-0.065	*	-1.653	-0.068
<i>TE</i>	-0.248		-1.233	-0.009
<i>Lev</i>	-0.068	***	-5.900	-0.136
<i>AssetTO</i>	0.002		0.562	0.004
<i>MROs</i>	0.142		1.526	0.031
<i>Msales</i>	0.004		0.673	0.007
<i>Mtangibility</i>	0.068		1.619	0.030
<i>Mintangibles</i>	-0.046		-0.293	0.076
<i>Mmtb</i>	-0.000		-0.032	0.000
<i>MOCF</i>	0.008		0.074	0.195
<i>Missue</i>	0.065	*	1.719	0.061
<i>Ownership</i>	-0.000		-0.373	-0.000
<i>GDPGrowth</i>	0.005		1.533	0.001
<i>Country dummies</i>		Included		Included
<i>Industry dummies</i>		Included		Included
<i>Year dummies</i>		Included		Included
Obs.		1,568		1,667
Adjusted R <sup>2</sup>		0.136		0.226

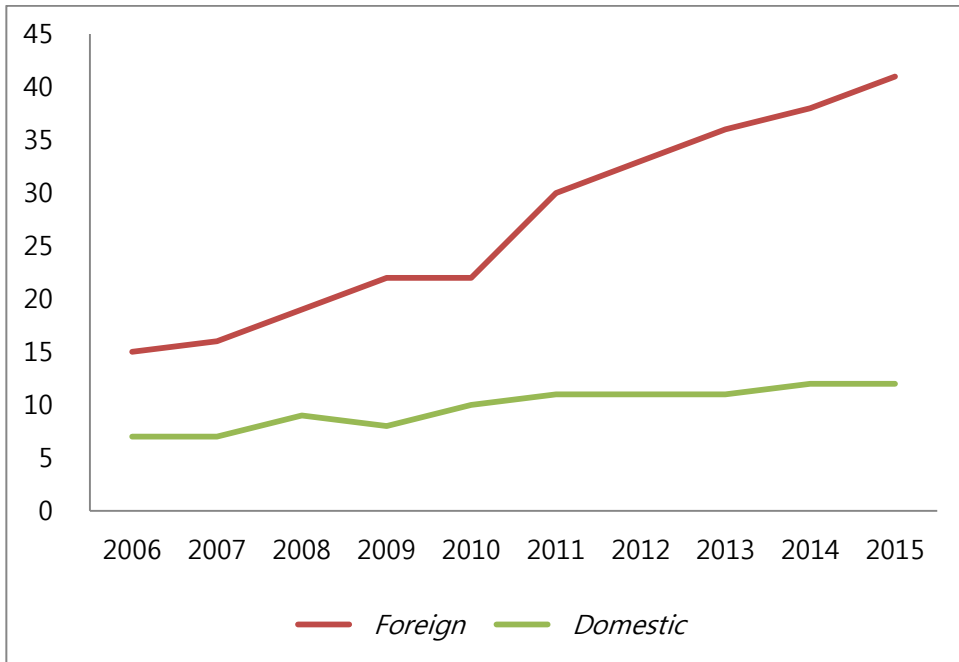
Columns (1) and (2) report the results from estimating Equations (4a) and (4b), respectively. See Appendix for the definition of variables. Standard errors are clustered by multinational firm and year. \*, \*\*, and \*\*\* denote significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

**Table 19**  
**Reexamining Intercompany Profit and Loss Transactions Using an Alternative Measure of *RoS***

Variable	<i>DTL</i>			
	(1) <i>LParent</i> ≥ 0.7	(2) <i>LParent</i> ≥ 0.9	(3) <i>LParent</i> ≥ 0.7	(4) <i>LParent</i> ≥ 0.9
<i>STRDiff</i>	-0.044	-0.112	0.087	-0.434 **
<i>STRDiff</i> * <i>Purchase</i>	-0.284 **	-0.328 *		
<i>STRDiff</i> * <i>Sale</i>			0.234	0.238
<i>Purchase</i>	0.261 *	0.316 *		
<i>Sale</i>			-0.250	-0.254
Obs.	51	29	42	24

This table shows the results from reexamining sample subsidiaries' intercompany profit and loss transactions with their parent using *DTL*, an alternative measure of *RoS*, and low-tax subsidiaries not subject to the CFC rule of multinationals which mostly have low-tax subsidiaries. Columns (1) and (2) (Columns (3) and (4)) report Pearson correlation coefficients between *DTL* and main variables used in the empirical analysis of sample subsidiaries' purchase transactions with their parent (sample subsidiaries' sale transactions with their parent). Moreover, Columns (1) and (3) (Columns (2) and (4)) use multinationals with *LParent* greater than or equal to 0.7 (0.9). See Appendix for the definition of variables. \*, \*\*, and \*\*\* indicate significance at 0.10, 0.05, and 0.01 in two-tailed tests, respectively.

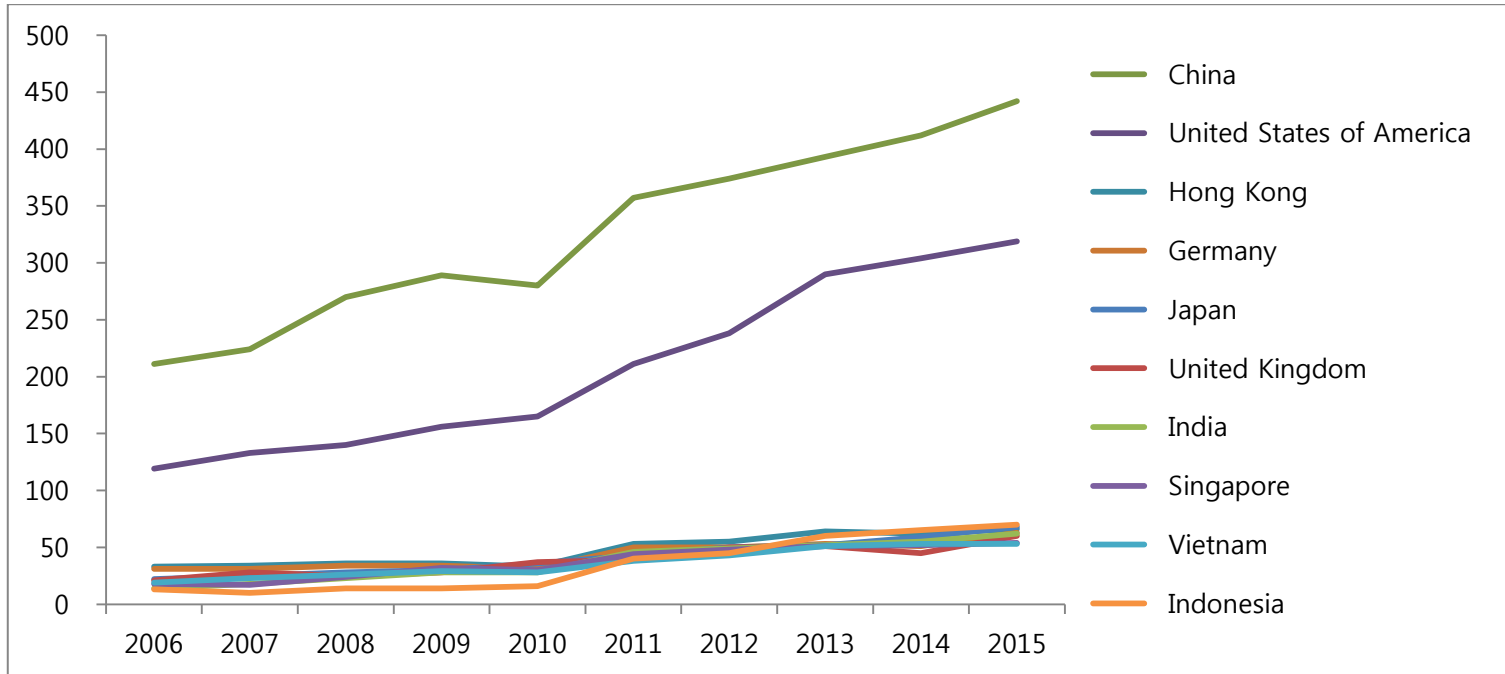
**Figure 1**  
**Distribution of Average Consolidated Subsidiaries per**  
**Sample Parent by Location and Year**



This figure shows the average number of consolidated subsidiaries per sample parent firm by location and year. *Foreign* and *Domestic* present foreign and domestic subsidiaries, respectively. The horizontal axis shows a sample year and the vertical numbers indicate the number of subsidiaries.

**Figure 2**

**Distribution of Consolidated Subsidiaries of Sample Parents by Foreign Country and Year**



This figure presents the number of consolidated subsidiaries of sample parent firms by foreign country and year using top 10 foreign countries based on the number of the subsidiaries. The horizontal axis shows a sample year and the vertical numbers indicate the number of subsidiaries.

## 국문초록

### 전세계과세 다국적기업들의 조세유인에 의한 소득이전: 한국기업을 중심으로

본 연구는 전세계과세 다국적기업들의 조세유인에 의한 소득이전과 관련된 실증적 증거를 자회사 수준에서 최초로 제시한다. 구체적으로 2006년부터 2015년까지 한국 다국적기업의 자회사 자료를 이용하여 실증 분석한 결과 전세계과세 다국적기업들은 조세부담을 경감하기 위해 소득을 본국에서 저세율국으로 이전하는 것으로 나타났다. 이는 규제기관의 국제조세회피에 대한 우려와 일치한다. 그러나 이러한 현상은 국제회계기준 (International Financial Reporting Standards, IFRS) 도입 이후 감소한 것으로 나타났다. 반면, 다국적기업들의 조세회피를 방지하기 위한 방안들로 구성된 국가 간 소득 이전을 통한 세원 잠식 (Base Erosion and Profit Shifting, BEPS) 패키지는 다국적기업들의 조세유인에 의한 국가 간 소득이전행위에 영향을 미치지 않은 것으로 나타났다. 마지막으로 본 연구는 다국적기업들이 조세를 회피하기 위해 모회사와 해외자회사 간의 내부거래를 활용하고 있는지를 분석하였으며, 그 결과 다국적기업들은 해외자회사와의 내부자본거래를 통해 조세절감목적의 소득이전을 하고 있는 것으로 나타났다.



**주요어:** 소득이전, 전세계과세시스템, 조세회피행위, 세무계획, BEPS,  
IFRS, 내부거래

**학 번:** 2013-30152