SHIFT HAPPENS: A COMPARISON OF THE TAX-MOTIVATED INCOME SHIFTING OF MULTINATIONALS IN TERRITORIAL AND WORLDWIDE COUNTRIES

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ABSTRACT

KEVIN S. MARKLE: Shift Happens: A Comparison of the Tax-Motivated Income Shifting of Multinationals in Territorial and Worldwide Countries
(Under the direction of Douglas A. Shackelford)

This paper tests for differences in the tax-motivated income shifting behaviors of multinationals subject to different systems of taxing foreign earnings. I find that multinationals subject to territorial tax regimes shift more income than those subject to worldwide tax regimes, but that the difference in shifting is not statistically different when the worldwide firms can defer repatriation of the shifted income. I also find that the difference in shifting is greater when the multinational is cash-constrained in its home country. In additional tests, I find that worldwide firms bear the dead-weight cost of having cash trapped in foreign subsidiaries while territorial firms do not.

To Robyn,
whose support and sacrifice are in every keystroke.

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1. Introduction

It is well documented that firms shift income across jurisdictions when they have a tax incentive and the ability to do so.[1] What is not yet known is whether the home country of a multinational affects its propensity to shift income. Because countries tax the foreign earnings of their multinationals differently, the domicile of a multinational might affect its income shifting if the tax laws reduce the incentive to shift. This paper tests for differences in income shifting based on cross-country variation in the taxation of foreign subsidiaries.[2]

Most studies of the effects of home country taxation of foreign earnings divide countries into two categories: territorial and worldwide. Territorial countries are those that generally exempt foreign income from home country tax. Worldwide countries are those that tax foreign income at the home country rate and allow credits for the foreign tax paid on the income.[3] However, many countries do not treat all types of foreign income uniformly and commonly have different rules for personal and corporate income and/or active and passive income. For example, Sweden exempts the foreign income of its corporations but fully taxes the foreign income of its individuals, meaning that Sweden would be classified as a territorial

[1] See Devereux and Maffini (2007) for a survey of this literature. More recent studies on the topic include Dischinger (2009), Dischinger and Riedel (2008), Klassen and Laplante (2009), and Dyreng and Lindsey (2009).

[2] There is no universally accepted definition of tax-motivated income shifting in the literature. In this study, I consider shifted income to be taxable income reported in a jurisdiction different from that in which it would be reported absent an action taken by management where a motive for the action taken is to reduce the overall tax burden of the multinational. Income can be shifted in many ways. The most common are through manipulation of the prices of intra-firm trades (transfer prices), location of debt, and location of intangibles. In this study, I do not address how the shifting is accomplished, but rather infer that income has been shifted based on deviation from an expected level of reported income.

[3] The systems are sometimes referred to as exemption and credit systems, respectively.

country for corporate tax purposes but as a worldwide country for individual tax purposes. In this study, I consider only multinational corporations and, as such, classify countries based on how they treat the foreign income of their corporations.[4]

Prior studies have shown that multinationals domiciled in territorial countries behave differently from those domiciled in worldwide countries in location of foreign direct investment (Hines, 1996, Clausing, 2009, Smart, 2010), headquarter relocations (Voget, 2008), and in subsidiary location choices (Barrios et al, 2009).[5] However, to my knowledge, no one has tested whether companies from territorial and worldwide countries differ in their response to tax incentives and opportunities to shift income. This paper conducts such tests.

Understanding whether income shifting is more prevalent in territorial countries should be important to policymakers because the international landscape is changing; both Japan and the UK (representing 9% and 5%, respectively, of global GDP) adopted territorial corporate tax systems in 2009, leaving the U.S. (28% of global GDP) as the sole member of the G8 taxing the worldwide active business income of its corporations.[6] Both the UK and Japan cited the competitiveness of their multinationals in global markets as a first-order

[4] Even within the realm of corporate tax, the worldwide/territorial classification is not as straightforward as it is commonly presented to be. It is most accurately made at the country-pair level since several countries treat the income earned in different countries differently. For example, Canada exempts the income earned in countries with which Canada has a bilateral treaty and taxes income earned in all non-treaty countries. Canada is most commonly classified as a territorial country since most of its trade is with treaty countries, but income earned by Canadian multinationals in approximately 35% of the countries of the world is subject to Canadian tax. Of the 32 (19) territorial (worldwide) parent countries in my sample, 15 (7) tax (exempt) foreign income earned in at least one foreign country. For ease of exposition, I continue to classify parent countries based on their predominant system in the text, but classifications are made at the country-pair level for the empirical tests in the paper.

[5] It should be noted that several other studies (Slemrod, 1990, Benassy-Quere et al, 2000, Altshuler and Grubert, 2001, and Hajkova et al, 2006) find no difference in the sensitivities to tax of the investments of the two groups.

[6] Because my study uses 2006 data, Japan and the UK are worldwide countries in this paper.

impetus for the change in policy.[7] It is widely acknowledged that the compliance costs of a worldwide system are significantly higher than those of a territorial system due to, for example, requirements of tracking foreign tax credits. It is concerns about such dead-weight costs and their impact on competitiveness that drive U.S. multinationals to call for conformity with other countries as the debates over international tax reform continue (Samuels, 2009). Missing from those debates are empirical comparisons of the behaviors of multinationals subject to different international tax laws. This paper begins to fill that void.

The incentive for a multinational to shift income is assumed to be driven by the expected returns to the shifting. Consider two multinational firms, T and W, identical except that T is domiciled in a territorial country, W in a worldwide country. Each has a home country tax rate of τ_P and owns one foreign subsidiary with a 0% tax rate. Both T and W shift \$$S$ of pretax income to their respective subsidiary, the subsidiary pays no tax and returns a \$$S$ dividend to its parent. T's dividend is exempt from home country tax, so T realizes savings from the shifting of $\$S * \tau_P$. W includes \$$S$ in its taxable income, has home country tax payable of $\$S * \tau_P$, which is equivalent to the tax W would have paid if the income was not shifted, and W realizes no return on income shifting.

On the surface, it appears obvious that territorial firms have a greater incentive to shift income. However, this highly stylized example does not include the effects of two important aspects of the worldwide system, deferral and cross-crediting, which can blur the distinctions from the territorial system (Altshuler, 2000, de Mooij and Ederveen, 2003).

[7] In a February, 2010 presentation, David Hartnett, Permanent Secretary for Tax, HM Revenue and Customs, said that three primary factors in the decision for the UK to switch to a territorial system were competitiveness, compliance burden, and anti-avoidance measures (Taxes, 2010).

Deferral refers to the provision which delays the liability for home country tax on the foreign earnings until they are repatriated as a dividend and adds a discount factor to the home country tax paid on the foreign earnings. Cross-crediting allows W to reduce its tax payable on foreign earnings if its foreign subsidiary in a second foreign country has paid tax at a rate higher than W's. Extending the example, if W had a second subsidiary with tax rate τ_H(where $\tau_H > \tau_P$) that earned \$$I$ in pretax income, that subsidiary would pay \$$I * \tau_H$ of tax, which is \$$I * (\tau_H - \tau_P)$ more than would have been paid at W's tax rate. Cross-crediting allows W to reduce its \$$S * \tau_P$ liability on the income shifted to the zero-tax subsidiary by \$$I * (\tau_H - \tau_P)$, the amount of the excess credit for the tax paid in the high-tax country. If the excess credit is greater than or equal to \$$S * \tau_P$, W saves \$$S * \tau_P$ (the same amount as the territorial parent, T) by shifting.

While the complexity of international tax law makes its consequences difficult to capture in generalized examples, the above example shows that the returns to (and, therefore, incentives for) income shifting for a multinational may be affected by how its foreign earnings are taxed and by the organizational structure and timing decisions of the firm itself. Of course, incentive is just one factor in determining whether firms shift income. Other factors include the constraints on the ability to shift (e.g., laws) and the costs (e.g., agency, political, efficiency) of shifting. As such, the observed income shifting of a multinational is determined by the interplay of its incentives, opportunities and constraints. Whether there are systematic differences in income shifting across groups of multinationals subject to different international tax laws is the empirical question asked in this paper.

Using a framework developed by Hines and Rice (1994), a tax variable which captures the incentive and opportunity to shift income among all countries in which the multinational operates, financial statement data of subsidiaries in 31 countries owned by parents in 51 countries, and pair-specific information about the bilateral tax relationship between countries, I directly compare the income shifting of worldwide and territorial multinationals to determine if there are systematic differences in how each responds to the incentive and opportunity to reduce overall tax burden by shifting income across borders. Four main findings emerge from the study. First, multinationals in both groups engage in tax-motivated income shifting and territorial firms, on average, shift more income than worldwide firms. Second, the income shifting of worldwide firms is increasing in their ability to invest the funds abroad while that of territorial firms is not. Stated another way, worldwide firms that can leave the shifted funds abroad shift as much as their territorial counterparts. Third, territorial firms shift more income when the parent is cash-constrained while worldwide firms shift less. Finally, despite the evidence that territorial firms shift more income to their low-tax subsidiaries, it is worldwide firms that bear the dead-weight cost of having more cash trapped in their low-tax subsidiaries. Japan adds some wrinkles to the results. In by-parent-country tests, I find no evidence of income shifting by Japanese multinationals and am unable, despite running multiple additional tests, to identify what is constraining Japanese firms that is not constraining firms domiciled in other countries. When Japan is excluded from the sample, inferences from all tests remain the same, but the magnitudes of the differences between the groups change.

The primary contribution of my paper is that it provides direct evidence of an association between income shifting and the taxation of foreign income in the parent's

country. To my knowledge, this is the first study to identify and test a specific determinant of income shifting behavior; while prior studies have shown that income is shifted in different settings and by different means, no study has documented specific factors that affect the degree of shifting. My findings contribute needed empirical data to the ongoing debate about international tax policy, the relevance of which is underscored by the recent changes made by Japan and the UK and the increasing isolation of the U.S. in the international tax realm.

My paper also contributes to the stream of literature examining the dead-weight costs associated with international tax rules. Extant research has shown that U.S. multinationals bear such costs and assumed that they impair the competitiveness of U.S. firms in markets where they compete with multinationals subject to territorial tax regimes. My results provide direct evidence of one such competitive disadvantage, the trapping of cash in foreign subsidiaries.

Finally, my paper contributes more generally to a growing literature in international tax and financial accounting by including countries from many different regions in the same sample. Much of the existing literature that is grouped under the banner "international" uses samples consisting either of parents domiciled in one country only (predominantly the U.S.) and their foreign affiliates or of European parents and their European subsidiaries. My study is among the first to use more comprehensive data that allow some of the caveats on generalizability of results to begin to be relaxed.

The paper is organized as follows: Section 2 reviews the principles of the tax systems and the relevant prior literature, and develops hypotheses. Section 3 describes the research

design. Section 4 describes the data. Section 5 presents the empirical findings. Concluding remarks follow.

2. Background and Hypotheses

2.1 Systems of taxing earnings of foreign subsidiaries

The reason that foreign earnings are taxed differently from domestic earnings is that all countries adhere to two general principles. First, that the country in which the income is earned has the right to tax it. Second, that each dollar of income should be taxed only once. The territorial system avoids double-taxation by exempting foreign income from domestic tax. The worldwide system avoids double-taxation by granting credits for foreign taxes paid which reduce the domestic tax liability. Every country in the world has autonomy in choosing whether and how to tax foreign earnings and whether and how to mitigate double-taxation. Despite this sovereignty over tax laws, in choosing how to tax the foreign earnings of their multinationals, the vast majority of countries choose one of two systems: territorial and worldwide.[8] Because this is so, an empirical investigation of the how the taxation of foreign income affects behavior is appropriately made by sorting observations into two groups. In order to understand how the differences between the groups may affect income shifting behavior, it is necessary to understand the principles and mechanics of each system.

A territorial parent receives dividends paid out of the after-tax earnings of its foreign subsidiaries and pays no domestic tax on those earnings.[9] The worldwide system is more

[8] To my knowledge, prior research has not explored the reasons that countries have clustered on this dimension while maintaining differences along other dimensions.

[9] There is a subdivision within the territorial group, with some countries taxing 5% of foreign dividends upon repatriation and some fully exempting all foreign dividends. The countries that choose to tax 5% of the dividends (Belgium, France, Germany, Italy, Netherlands Antilles, and Switzerland) do so as a means to offset any expenses related to the foreign subsidiaries that are incurred and deducted from taxable income in the parent country. Most countries that fully exempt the

complicated because it does not treat the income of each foreign subsidiary in isolation. The underlying premise of the worldwide system is that the parent should pay the same amount of tax (the sum of foreign and domestic) that would be paid if the income were earned domestically, regardless of where the income is earned. Consider the case of a parent owning two foreign subsidiaries, H and L, where H's tax rate is higher than the parent's and L's is lower than the parent's. When H pays a dividend to the parent, the parent does not pay any domestic tax since the amount of tax on the income already exceeds the amount of tax that would have been paid had the income been earned in the parent country. When L pays a dividend to the parent, the parent includes the income (not the dividend) in its domestic taxable income. The parent then receives a foreign tax credit which reduces its tax payable by the amount of the foreign tax that was paid. At this point, the total amount of tax paid on the aggregate foreign income is higher than what would have been paid if the income all had been earned in the parent country (L's was taxed at the parent's rate, but H's was taxed at a rate higher than the parent's). Cross-crediting allows the parent to reduce the amount of domestic tax payable on the earnings of L by the amount by which the tax paid in H's country exceeds that which would have been paid if the income had been earned in the parent country.[10,11] In a case in which the excess credit for tax paid by H fully offsets domestic tax

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dividends collect no tax related to the foreign earnings and thus forego any offset of lost revenues, but a small number (e.g., Australia, Hong Kong, and Singapore) impose limits on the deductibility of expenses based on the scale of foreign investment. In countries that tax 5% of foreign dividends, a parent receives dividends paid out of the after-tax earnings of its foreign subsidiaries, includes the non-exempt portion of the dividend in its taxable income, and does not receive a domestic credit for the foreign income tax paid. For ease of exposition, I consider only the two extremes (fully exempt (territorial) and fully taxable (worldwide)) in this discussion.

[10] Cross-crediting is limited to the amount of domestic tax paid on the earnings of L and any excess credits can be carried forward.

[11] The system of cross-crediting described here is that of the U.S. There are further restrictions on cross-crediting whereby credits can only be used to offset tax paid on income in a similar "basket". As of December, 2006 the U.S. system reduced from nine baskets based on industry to two baskets, passive and general. In the UK, a system referred to as "Onshore

payable on the earnings of L, the taxation of L is identical to what it would be under a territorial system.

The foreign income is not included in the taxable income of the parent until the dividend is paid by the subsidiary to the parent.[12] This principle, commonly referred to as deferral, introduces time value of money savings to the shifting. In the extreme case in which the worldwide parent never repatriates the dividend from the foreign subsidiary, the taxation of the earnings of the low-tax subsidiary of the worldwide parent looks identical to that of the territorial parent. Given the effect that cross-crediting and deferral can have on the tax paid on foreign income, it is not a given that the returns to shifting of a territorial parent are greater than those of a similar worldwide parent.

2.2 The effect of international tax systems on income shifting

In a recent survey of experienced partners and managers in the transfer pricing groups of two Big 4 accounting firms, Mescall (2010) asked two questions related to my research question.[13] First, he asked if the tax system (worldwide vs. territorial) in which a multinational is based affects its transfer pricing incentives. 62% responded "yes", 18% responded "no", and 20% responded "unsure". Second, he asked if the practitioner would expect a multinational based in a worldwide tax system to be less aggressive than, more aggressive than, or equally aggressive as a firm based in a territorial system. 30% answered

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Pooling" has been in place since March, 2001 and functions like the U.S. system. Japan's system is similar to that of the U.S. Of the countries in the worldwide group in this study, only Poland limits foreign tax credits on a per-country basis.

[12] This is generally true only for active business income of the subsidiary (see Scholes, et al (2009) for a more detailed discussion). All worldwide countries tax passive income of foreign subsidiaries as it is earned. Ideally, I would be comparing the shifting of active income. Unfortunately, I am not able to separate active and passive income in my data.

[13] The survey respondents are located in 32 different countries. For more specific information about the survey and the respondents, see Mescall (2010). I am grateful to Devan Mescall for sharing these data with me.

"less", 31% answered "more", and 39% answered "equally". At first glance, the two results appear contradictory and suggest that firms do not respond to incentives in expected ways. However, I infer from the results that, although the incentives of the territorial group dominate those of the worldwide group, constraints on the ability to respond to those incentives render predictions of behavior ambiguous. I also interpret the results of the second question as saying that a worldwide system, in and of itself, is not an effective disciplining mechanism for the transfer pricing practices of its multinationals.

Consistent with this interpretation, prior studies comparing the behaviors of worldwide and territorial firms have found mixed results. I consider these studies in a framework suggested by Devereux and Maffini (2007) which characterizes the choices of firms wanting to access foreign markets as a four-step decision process: 1. A choice between producing at home and exporting and producing abroad; 2. A choice of where to locate production; 3. A choice of the scale of investment; and 4. A choice of the location of profit. Several previous studies have compared the tax sensitivities of territorial and worldwide firms in the second and third steps. Slemrod (1990), Benassy-Quere et al (2000), Altshuler and Grubert (2001), and Hajkova et al (2006) find no difference in the location decisions of worldwide and territorial firms while Hines (1996), Wijeweera et al (2007), Barrios et al (2009), Clausing (2009), and Smart (2010) find that territorial firms are more sensitive to tax in their investment location decisions.[14] To my knowledge, no previous study has compared

[14] Other recent studies have made comparisons of worldwide and territorial firms in the context of organizational structure decisions. Voget (2008) finds that worldwide multinationals are more likely to relocate their headquarters in response to tax rate incentives than are territorial multinationals, while Huizinga and Voget (2009) find the parent firm is more likely to be located in the territorial country following the merger of a territorial firm and a worldwide firm.

worldwide and territorial firms in step four (location of profit) and it remains an open question whether they differ in their tax-motivated income shifting.

2.3 Hypotheses

If all else is held constant, a territorial firm will save at least as much cash tax as a worldwide firm by shifting taxable income to a jurisdiction in which it will face a lower tax rate. The deferral provision can result in a convergence of the savings of the two groups when the worldwide firm is able to delay dividend repatriation indefinitely. Cross-crediting can result in a convergence of the savings when the worldwide firm has excess credits because its income earned in low-tax jurisdictions will, in substance, be exempt from home-country tax due to the application of the excess credit. However, since these conditions for convergence are not always present, I predict that territorial firms, on average, shift more income than worldwide firms. This leads to the first hypothesis, stated in the alternative:

> H1: A multinational subject to a territorial tax regime shifts more income for tax reasons than does a similar multinational subject to a worldwide tax regime.

The deferral provision within the worldwide system delays the cash tax liability due on the active foreign earnings until they are repatriated to the parent as a dividend. To the extent that a worldwide multinational is able to reinvest shifted income in the foreign jurisdiction and delay repatriation indefinitely, it moves closer economically to its territorial counterpart. Based on this reasoning, I state my second hypothesis:[15]

[15] Ideally, I would test a similar hypothesis about the effect of being in an excess credit position on the income shifting of worldwide firms. Unfortunately, the data available to me do not allow me to calculate a reliable proxy for the foreign tax credit position of a firm and I am unable to conduct such tests. Grubert and Mutti (2001) use confidential tax return data of U.S. multinationals to compare the shifting of excess credit firms to excess limit firms within a worldwide country and find no difference in the shifting of the two groups.

H2: The difference in the tax-motivated income shifting of territorial and worldwide firms is decreasing in the reinvestment opportunities in the foreign country.

Hypothesis 2 examines the ability to defer by considering foreign reinvestment opportunities. Another determinant of the ability to defer may be the need for cash in the parent's home country. In supporting his opinion that transfer pricing pressures would not increase if the U.S. adopted a territorial system, John M. Samuels said that under the current (worldwide with deferral) system "…a company can always repatriate all or any portion of its foreign earnings at any time it chooses, with the only cost of the repatriation being the same U.S. tax that it would have had to pay had if it had not shifted the income outside of the U.S. in the first place." (Taxes, 2010)[16] This assumes that cash constraints do not compel the company to undertake repatriations. If the shifted income will have to be returned to the parent country in the near future, the incentives to shift are reduced. If a territorial parent requires cash in its home country, it can (in theory) shift income to a lower-tax country and immediately repatriate it to the parent, resulting in more cash in the parent country than if the shifting was not undertaken. If a worldwide parent undertakes the same transaction, it ends up with the same amount of cash in the parent country whether the shifting is undertaken or not. This leads to three separate but related hypotheses:

H3a: The tax-motivated income shifting of worldwide firms is decreasing in the cash constraints of the firm in its home country.

H3b: The tax-motivated income shifting of territorial firms is increasing in the cash constraints of the firm in its home country.

[16] John M. Samuels is Vice President and Senior Counsel, Tax Policy and Planning of General Electric Corporation. He made these remarks at the Tax Council Policy Institute's 11th Annual Tax Policy & Practice Symposium in February, 2010 (Taxes, 2010). I thank Mr. Samuels for sharing his notes with me and for subsequent discussions.

H3c: The difference in the tax-motivated income shifting of territorial and worldwide firms is increasing in the cash constraints of the firm in its home country.

Finally, and related to H2, a worldwide firm faces a cost to repatriating dividends out of foreign earnings in the form of home country tax on the underlying income (net of foreign tax credits). A territorial firm faces no such cost. If the worldwide firm alters its repatriation decisions to defer the cost, it could end up having its cash trapped in jurisdictions with suboptimal rates of return. Anecdotal evidence suggests that this theoretical difference plays out in real decisions. Current estimates of the aggregate indefinitely reinvested foreign earnings of U.S. multinationals are over $1 trillion, an increase of 70% since 2006 (Drucker, 2010). In Japan, one of the main reasons for adopting a territorial system was to boost its domestic economy by encouraging repatriation (Taxes, 2010). Consistent with this expectation, on May 18, 2010, the Nikkei English News reported that Japanese multinationals repatriated a record 3.14 trillion yen from foreign subsidiaries in 2009 (an increase of nearly 20% over the previous year) and attributed the increase to the change to a territorial system.[17]

There is also empirical evidence that repatriation taxes affect the cash allocation decisions of U.S. multinationals. Foley et al. (2007) show that, in a sample of U.S. (i.e., worldwide) multinationals, firms hold more cash in foreign subsidiaries dividends from which would face higher repatriation taxes. In concurrent research, both Blouin, Krull and Robinson (2010) and Graham, Hanlon and Shevlin (2009) find that dividend repatriation

[17] David Hartnett, Permanent Secretary for Tax, HM Revenue and Customs, said at a February, 2010 symposium that, following the change to an exempt system, the UK is "just waiting to see how large the wall of cash to come in is" (Taxes, 2010).

decisions of U.S. multinationals are affected by the tax cost.[18] Because such costs are zero for territorial firms, it is predicted that their repatriation decisions would be unconstrained. I state this prediction as my final hypothesis:

H4: The level of cash held in a foreign country is increasing in the difference in tax rates between parent and subsidiary country for worldwide firms and unrelated to the tax rate difference for territorial firms.

[18] In both of these studies, a separate effect from the financial statement costs is identified. Because the financial reporting consequences of shifting and deferring for a worldwide firm are identical to those of shifting for a territorial firm, there is no reason to expect a difference in financial reporting incentives.

3. Research design

3.1 Tests of Hypotheses 1, 2 and 3

To test Hypotheses 1 - 3, I estimate various modifications of the following regression equation:

$$(1)\ LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 C_i + \beta_3 TT_i * C_i + \beta_4 LogASSETS_i + \beta_5 LogCOMP_i + \beta_6 LogVA_i + \beta_7 STABILITY_i + \beta_8 LAW_i + \varepsilon_i$$

where

$LogPLBT_i$ is the natural logarithm of earnings before tax reported on the unconsolidated financial statements of subsidiary *i*.

TT_i is an indicator variable equal to 1 if dividends paid by subsidiary *i* to its parent are either fully- or 95%-exempt from tax in the parent country; 0 otherwise.

C_i is the measure of family-level tax incentive and opportunity derived by Huizinga and Laeven (2008) calculated as follows (see Appendix A for sample calculations):

$$C_i = \frac{1}{(1-\tau_i)} \frac{\sum_{k \neq i}^{n} \frac{B_k}{1-\tau_k}(\tau_i - \tau_k)}{\sum_{k=1}^{n} \frac{B_k}{1-\tau_k}}$$

where

τ_i is the statutory tax rate of subsidiary *i*.

τ_k is the statutory tax rate of subsidiary *k*, where *k* runs from 1 to *n*, where *n* is the number of subsidiaries controlled by the parent.

B_k is the true profits of subsidiary *k*. Revenue is used as a proxy.[19]

$LogASSETS_i$ is the natural logarithm of tangible fixed assets reported on the unconsolidated financial statements of subsidiary *i*.

[19] A more appropriate proxy for true income would be total assets since operating revenue can be shifted. Because operating revenue is available for more subsidiaries, I use it in my reported results and use total assets in sensitivity tests. Inferences are unchanged when total assets is used as the proxy for true income.

$LogCOMP_i$ is the natural logarithm of compensation expense reported on the unconsolidated financial statements of subsidiary i.

$LogVA_i$ is the natural logarithm of country-industry-specific value added (in millions of U.S. dollars) of the 2-digit NACE industry code of i. Where multiple industries are being aggregated, a weighted average is taken with operating revenue providing the weights.

$STABILITY_i$ is an index running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). The variable is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism."

LAW_i is an index running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). The variable is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

Equation 1 is based on the empirical model developed by Hines and Rice (1994), which begins with the premise that the profit reported by an entity is the sum of the true profit generated and any profit resulting from income shifting.[20] Because true profit is unobservable, it must be estimated. To derive their empirical model, Hines and Rice (1994) assume a Cobb-Douglas production function and arrive at an estimation model that expresses reported income as a function of labor and capital inputs, a general productivity component, and a measure of tax incentive. Consistent with prior studies, I use $LogCOMP$ and $LogASSETS$ as the proxies for labor input and capital input, respectively. As the proxy for general productivity, I use $LogVA$ (which is at the country-industry level) rather than the natural logarithm of either the gross domestic product (GDP) or the per capita GDP of the

[20] To address potential concerns related to scale in Equation 1, I run all main tests using alternative specifications in which I scale all financial statement variables by total assets and by total revenue (i.e., I replace *LogPLBT*, *LogCOMP*, and *LogASSETS* with *PLBT/SCALAR, COMP/SCALAR*, and *ASSETS/SCALAR*, respectively). Inferences are unchanged when these specifications are used.

subsidiary country used in prior literature because it captures intra-country differences that are aggregated away by the GDP measures.[21]

I add two additional variables to the model used by Huizinga and Laeven (2008), $STABILITY$ and LAW. These variables are intended to capture subsidiary-country-level factors that could influence the amount of income a multinational reports in a country. For example, if a firm has the tax incentive and opportunity to shift income into a country but that country's instability puts the transferred income at risk, the expected return to shifting will be less than it would be in a more stable country.

3.2 Tax variable

The unit of observation in my empirical tests is an aggregation of all corporations in a country that are ultimately controlled by a common global ultimate owner. Equation 1, then, says that the level of pretax income reported in a country is a function of the capital, labor and productivity inputs, the culture of the country, and the tax incentive to shift income into or out of the country. As the tax incentive to shift income, I use the measure developed by Huizinga and Laeven (2008), C, which captures the incentive to shift income among all countries in which the global ultimate owner operates, subject to constraints on the shifting.[22] In principle, C is a weighted average of the tax rate differences from all other entities in the corporate family. It is derived theoretically under three assumptions: that global after-tax profit of the multinational is maximized, that the cost of shifting into or out of a country is

[21] Inferences remain the same when log(GDP) and log(per capita GDP) are used as the productivity proxy.

[22] Most studies prior to Huizinga and Laeven (2008) used a rate difference between the parent and subsidiary country as the proxy for incentive to shift income, thus ignoring both the opportunities to shift among subsidiary countries and the constraints on shifting.

increasing in the ratio of the shifted profit to true profit in the country, and that shifting costs are tax-deductible. It is the second assumption that results in true income (B) entering the weight and the third assumption that results in $(1 - \tau_k)$ entering the weight.

Appendix A presents examples of how C is calculated and how it varies with its inputs and from simple rate differences. To convey its basic concepts, I provide a simple example here. Consider two multinationals, M1 and M2, both domiciled in Country X (tax rate 40%) with subsidiaries in Country Y (tax rate 20%) and Country Z (10%).[23] Next, assume that both M1 and M2 have exactly $100 of global true income, and that M1's is allocated 70/20/10 among A/B/C while M2's is allocated 10/20/70. C_X is equal to 0.09 for M1, while C_X is equal to 0.40 for M2.[24] Both have a positive sign, which reflects an incentive to shift income out of X, but the magnitude of M2's is more than four times that of M1. M1's C_X has a smaller magnitude because the portion of its true income that is in X is so large; while M1 has just as strong a rate incentive to shift income out of X, the income has to go somewhere and the costs of shifting it into Y and Z limit its shifting.

Looking at the low-tax countries, M1's C_Z is equal to -0.27 and M2's is equal to -0.07. In this case, the difference in magnitude can be thought of as being driven by the availability of income to be shifted into Z; M1 has a higher magnitude because its total costs (in all three countries) to shift a dollar into Z are less than those of M2. This simple example reinforces the theoretical foundations of C; it reflects the specific opportunity set of the

[23] With no constraints on shifting, M1 and M2 would both shift all income out of X and Y into Z. However, laws and enforcement mechanisms as well as costs related to the shifting itself will constrain the shifting.

[24] $\frac{1}{(1-0.4)}\frac{\frac{20}{1-0.2}(0.4-0.2)+\frac{10}{1-0.1}(0.4-0.1)}{\frac{70}{1-0.4}+\frac{20}{1-0.2}+\frac{10}{1-0.1}} = 0.09$; $\frac{1}{(1-0.4)}\frac{\frac{20}{1-0.2}(0.4-0.2)+\frac{70}{1-0.1}(0.4-0.1)}{\frac{10}{1-0.4}+\frac{20}{1-0.2}+\frac{70}{1-0.1}} = 0.40$

multinational and its value is driven by both rate differences and differences in the allocation of true income.

3.3 Test of Hypothesis 4

To test for differences in the relation between tax costs and cash held in foreign countries across the two groups, I estimate the following equation, adapted from that of Foley et al. (2007):[25]

$$LogCASH_i = \beta_0 + \beta_1 TT_i + \beta_2 STATDIFF_i + \beta_3 TT_i * STATDIFF_i + \beta_4 LogNI_i + \beta_5 LogASSETS_i + \beta_6 StdevNI_i + \beta_7 CAPEX_i + \beta_7 LEV_i + \beta_8 RD_i + \beta_9 DOM\_RD_i + \varepsilon_i \quad (2)$$

where

$LogCASH_i$	is the natural logarithm of (cash/total assets) reported on the unconsolidated financial statements of subsidiary *i*.
TT_i	is an indicator variable equal to 1 if dividends paid by subsidiary *i* to its parent are either fully- or 95%-exempt from tax in the parent country; 0 otherwise.
$STATDIFF_i$	is the statutory rate of the parent less the statutory rate of subsidiary *i*; set to 0 if negative.
$LogNI_i$	is the natural logarithm of (net income/total assets) reported on the unconsolidated financial statements of subsidiary *i*.
$LogASSETS_i$	is the natural logarithm of total assets reported on the unconsolidated financial statements of subsidiary *i*.
$StdevNI_i$	is the standard deviation of (net income/total assets) reported on the unconsolidated financial statements of subsidiary *i* in years 2001 – 2006.

[25] Foley et al. (2007) include the ratio of research and development expense to total assets as an independent variable. As R&D is not available in my data, I use intangible fixed assets as a proxy. Also, they use a country tax rate as their proxy for tax cost of repatriation because all of the parents in their sample were domiciled in the U.S. and faced the same statutory tax rate. Because my parents are in different countries, I use the difference in rates. Lastly, Orbis does not have data on capital expenditures. I estimate it as (ending tangible fixed assets – beginning tangible fixed assets + depreciation).

$CAPEX_i$	is (capital expenditures/total assets) reported on the unconsolidated financial statements of subsidiary *i*.
LEV_i	is ((current liabilities + long-term debt)/total assets) reported on the unconsolidated financial statements of subsidiary *i*.
RD_i	is (intangible fixed assets/total assets) reported on the unconsolidated financial statements of subsidiary *i*.
DOM_RD_i	is (intangible fixed assets/total assets) reported by the ultimate owner of subsidiary *i* in its home country.

4. Data

4.1 Financial statement and ownership data

Financial statement and ownership data are taken from the Orbis database maintained by Bureau van Dijk. Up to ten years of financial statement data are available and are reported in U.S. dollars. The ownership data are static as of the most recent report date. Because the tax rate and tax law data used in the study are current as of January 1, 2007, I use 2006 as the sample year on the assumption that it is the year with the fewest mismatches of the various data sources.[26]

Global Ultimate Owners

Orbis identifies a firm as a Global Ultimate Owner (GUO) if it controls at least one subsidiary and is itself not controlled by any other single entity. I begin creating my sample with a list of all GUOs in the database. I then create a list of subsidiaries that are identified as being ultimately controlled by each GUO in the sample.[27] For each subsidiary, I obtain its country of domicile and all needed financial statement variables.[28]

Aggregation

[26] January 1, 2007 is the most recent date at which the proprietary information on the bilateral relationships between countries obtained for the study were available to me.

[27] A subsidiary is considered ultimately controlled by the GUO if all links in the ownership chain between it and the GUO have ownership percentages greater than 50%. As such, subsidiaries of all levels are included in the sample. For example, if GUO A owns 100% of B and B owns 75% of C which owns 25% of D, B and C would be counted as ultimately owned by A while D would not.

[28] In Orbis, the country of domicile is based on the primary trading address of the firm. The country of incorporation is also available in the data. In my sample, there are no observations for which the country of primary trading address and country of incorporation are different.

Organizational structure can vary widely among multinationals. For example, one firm may choose to operate through one subsidiary in each country while an otherwise similar firm may choose to use multiple subsidiaries in each country. Or one firm may choose to own all of its subsidiaries directly while a similar firm may have more complex ownership structures. To enable comparisons across all possible structures, I aggregate all subsidiaries controlled by the same GUO at the country level.[29] For ease of exposition, I continue to refer to these aggregated groups as subsidiaries throughout the remainder of the paper. The corporate group to be studied, then, consists of a GUO and the portfolio of countries in which it has controlled subsidiaries and income shifting is presumed to be possible among all members of the group.[30]

All financial statement variables are summed by country since they are drawn from unconsolidated statements. The proxy for productivity I use is the country-industry-specific value added for 2006.[31] To calculate an aggregate value for all entities within a given country, I take the weighted average of the value added of each entity's industry, with the weights provided by the operating revenues of the entities.

Common-parent subsidiaries

[29] A subsidiary is included if it has unconsolidated data for all variables in Equation 1 for 2006 and it is not in a service, financial, or insurance industry. These industries are excluded on the assumption that the empirical model of true income is not well specified for them. When these industries are included in the sample, inferences remain largely unchanged.

[30] In additional untabulated tests, I use the total ownership percentage that the GUO has in the subsidiary rather than relying on the links within Orbis and include only subsidiaries with various minimum ownership percentages. The percentages tested are 100%, 90%, 70% and 60%. Inferences from these tests are not different from those reported.

[31] This variable is obtained from the OECD STAN database. The specific variable I use is VALU, the value added at current prices.

Subsidiaries that do not have all data items required to be in the sample contribute to the calculation of the tax incentive variable (C) if they report operating revenue for 2006. There are 5,611 parents in 51 countries that have at least one subsidiary in the sample. For these parents, the number of common-parent (sample) subsidiaries is 28,513 (15,546).[32] The number of common-parent (sample) subsidiary countries is 67 (31).

4.1.1 Example of data

I provide the following example to illustrate how the data in Orbis end up contributing to the calculation of the variables. Parco, a global ultimate owner, is domiciled in France. It has 11 subsidiaries distributed across four countries as follows: five in France, three in The Netherlands, two in the U.S., and one in Bermuda. The unconsolidated financial statements of Parco are also available, meaning there are 12 entities in total. Ideally, all 12 of them are included in Orbis, are identified as ultimately controlled by Parco, and have the financial statement variables needed to be included as sample firms. If this is the case, then the six (parent plus five subsidiaries) companies in France are aggregated into $\text{Parco}_{\text{France}}$, the three in The Netherlands are aggregated into $\text{Parco}_{\text{Netherlands}}$, and the two in the U.S. into Parco_{US}. The subsidiary in Bermuda is $\text{Parco}_{\text{Bermuda}}$. Each of these aggregated "subsidiaries" is then an observation in the dataset, meaning Parco contributes four observations to the sample.

For the calculation of C for a given observation, the other three subsidiaries serve as common-parent subsidiaries for the subsidiary whose C is being calculated. For example,

[32] As noted previously, the term "subsidiary" here represents the aggregation of all corporations within a country.

$C_{ParcoNetherlands}$ would be calculated with the true incomes and tax rates of $\text{Parco}_{\text{France}}$, Parco_{US}, and $\text{Parco}_{\text{Bermuda}}$ in the numerator.

There are three grades of limitations to the data. First, Orbis could not know that the corporation exists or could fail to link it as ultimately owned by its GUO. In either case, the corporation is not included in the study. Second, the corporation could have no financial statement data (i.e., all that is known about the corporation is that it exists and that the GUO ultimately controls it). These corporations do not contribute either to the sample or to the calculation of C, but they contribute to calculations of the completeness of the data that is used. Third, the corporation could have data for operating revenue, but not for all of the regression variables (i.e., pretax income, tangible fixed assets and employment costs). These corporations contribute to the calculation of C for the other subsidiaries controlled by the same GUO, but are not included as sample observations.

4.2 Classification of subsidiaries

To determine the effect of foreign dividend taxation on income shifting, I would ideally use a continuous variable equal to the percentage of dividends that are taxed. However, as noted previously, countries have clustered into two groups (territorial and worldwide), denying me the opportunity to use a continuous experimental variable.[33] A subsidiary is classified as territorial if its dividends would be either fully- or 95%-exempt

[33] The only countries of which I am aware that do not either fully exempt, exempt 95%, or fully tax foreign income are Belarus (which taxes 62.5% of dividends from all countries), Czech Republic (which taxes 62.5% of dividends from most non-European countries and exempts dividends from most European countries), Israel (which taxes 81% of dividends from all countries except Singapore and The Netherlands, dividends from which are exempt), and Pakistan (which taxes 54% of dividends from all countries). There are 35 usable observations for Israel in my data. However, they are excluded from the analyses. When those 35 observations are included in the worldwide group, results are unchanged. The Czech Republic is included in the sample as a territorial country because all sample subsidiaries with it as the parent country are in Europe.

from home country tax if paid directly to its Global Ultimate Owner. A subsidiary is classified as worldwide if its income is fully taxable in the country of the GUO.[34] To classify country pairs more precisely, I obtain detailed proprietary information on each country pair from Comtax.[35] Comtax synthesizes the information in countries' tax codes as well as the bilateral tax treaties that exist between countries to determine what percentage of foreign dividends are taxed when paid from the subsidiary country to the parent country. This information enables me to classify each subsidiary as worldwide or territorial rather than assuming that all subsidiaries of parents in the same country fall in the same category. This is potentially important because countries do not treat income from all foreign countries the same. For example, Belgium exempts 95% of dividends from all countries except Poland (dividends from which are fully exempt), British Virgin Islands, Gibraltar, Iran, Isle of Man, Jersey, Liechtenstein, Monaco, Oman and Panama (dividends from which are fully taxable).

4.3 Sample

Table 1 summarizes how each country contributes to the parents, sample subsidiaries, and common-parent subsidiaries in the sample. The statutory tax rate (which includes sub-national income tax for a representative firm in the country – for example, the U.S. rate of 40% is comprised of the 35% federal rate and the 5% rate of a firm in New York State) as of

[34] Under this classification system, a subsidiary in Malaysia that is controlled by a firm in the Netherlands (a territorial country) which is itself controlled by a U.S. (worldwide) GUO would be classified as worldwide even though its dividends, when paid directly to its immediate parent in the Netherlands, would be exempt from tax. This assumption is necessary because corporate structures can vary widely across multinationals. In the sample, 90.1% of the subsidiaries that get aggregated together are controlled directly (i.e., with no third country between the GUO country and the subsidiary country). When tests are run using only these subsidiaries, inferences are unchanged.

[35] Comtax is an international tax planning company based in Sweden that produces software intended to help companies structure transactions tax efficiently.

January 1, 2007 is reported in the first column.[36,37] The other three columns report the number of parents, sample subsidiaries, and common-parent subsidiaries domiciled in each country.[38]

Summary statistics for the sample are reported in Table 2. Panel A reports the number of observations, mean, median, maximum, minimum and standard deviation for the regression variables for the full sample divided into two subsamples: territorial and worldwide. Panel B reports the means by country of domicile of the subsidiary. Panel C reports the means by country of domicile of the parent. Panel D of Table 2 reports the distribution of sample observations across subsidiary countries by parent country.[39]

Panel A shows that the sample is made up of 9,962 territorial subsidiaries, and 5,584 worldwide subsidiaries. Unfortunately, this uneven distribution is a function of data availability (the most complete financial statement data in Orbis are for European countries which, with the exception of the UK and Greece, use territorial systems) rather than the distribution of countries (53 of the 109 countries (49%) included in the Comtax database are territorial), or the distribution of income (67% of global GDP in 2006 was in worldwide

[36] These rates are largely unchanged from January 1, 2006. Of the parent countries with more than 30 observations in my sample, only The Netherlands (30% at 1/1/06 and 26% at 1/1/07) had a different rate.

[37] A limitation of using statutory rates is that it ignores distribution taxes. Several countries (e.g., Austria, Japan, Poland, Portugal, Chile and South Africa) have increased distribution taxes (which can be structured as a separate final tax or a withholding tax) as corporate rates have fallen as a means of equalizing the rate on distributed dividends with the top personal rate in the country. Because I am unable to separate distributed income from retained income in my data, I am forced to ignore differences in distribution taxes.

[38] The sample subsidiaries are a subset of common-parent subsidiaries.

[39] Countries are not included in Panel B if they have fewer than 50 observations. All observations are included in Panels A, C and D and in all regressions unless otherwise noted.

countries).[40] The worldwide subsidiaries are larger, on average, than those in the territorial group. As discussed by Huizinga and Laeven (2008), it is not surprising that the median value of C, the tax incentive variable, is close to zero in each of the subsamples since it is a weighted average of bilateral tax differences within a corporate group. The range of C in my sample (-0.35 to 0.35) is consistent with that in Huizinga and Laeven (2008) (-0.43 to 0.53).

Panel B of Table 2 reports the means of the variables grouped by subsidiary country. The first column (N) reports the number of observations and confirms that the sample is dominated by European subsidiaries. The second column (# parent countries) reports the number of different countries parents from which have subsidiaries in the given country. For example, the 204 Austrian subsidiaries are owned by parents in 24 different countries. The column %Territorial reports the percentage of subsidiaries in the given country that are owned by GUOs domiciled in territorial countries. The final seven columns report the means of the regression variables for each country.

Panel C of Table 2 reports the means of the variables grouped by parent country. The parents also are dominated by European countries, but subsidiaries of parents from non-European countries combine to represent 36% of the sample. In this panel, the second column reports the number of parents (i.e., Global Ultimate Owners) domiciled in the given country having subsidiaries in the sample. For example, the first row reports that 30 different Australian GUOs have a total of 80 subsidiaries in the sample.

[40] Bureau van Dijk obtains most of its financial statement data from the compulsory filings of corporations. Most European countries require private companies to file annual reports while other countries (e.g., the U.S.) do not have such requirements. Further details on the data sources and collection procedures can be obtained at the Bureau van Dijk website (www.bvdep.com).

Panel D of Table 2 reports the distribution of sample observations across subsidiary countries by parent country, reporting only those parent countries with at least 500 observations. All numbers except the first column (N) are percentages. For example, looking at the Belgium column, 31% of the 573 subsidiaries that have a Belgian parent are in Belgium and 1% are in Bulgaria.

Table 3 reports the Pearson (above the diagonal) and Spearman correlations for the regression variables.

5. Results

5.1 Tests of Hypothesis 1

5.1.1 Cross-sectional tests

To establish consistency with prior results, I first estimate Equation 1 on the full sample without the indicator variable (TT) and interaction term ($TT * C$). Table 4, Model 1 presents the results. The coefficient estimates on the labor and capital proxies and the tax variable, C (-1.12), are similar to those estimated in other studies using U.S. data only (Blouin et al, 2009) and European data only (Huizinga and Laeven, 2008) from different time periods.[41]

Having established consistency with prior results in my data, I now proceed to the main tests of the paper. Models 2 and 3 in Table 4 present the results of estimating Equation 1 on the full sample, first without the two subsidiary-country variables (Model 2) and then with them. Focusing on Model 3, the estimate of the coefficient on C is negative (-0.47) and significant. Since C is calculated such that a negative value indicates a tax incentive to shift income in to the subsidiary subject to constraints, a negative relation with reported income is interpreted as tax-motivated income shifting. The estimate of the coefficient on $TT * C$ is

[41] To control for the effect of outliers, I use robust regression, which uses an iterative approach to assign weights to each observation. Observations that are assigned a zero weight are not included in the final regression. This results in small variations in the N reported in different models using the same sample.

negative (-0.88) and significant, meaning that territorial subsidiaries shift more income than worldwide subsidiaries, all else equal.[42]

The relative difference in magnitude is large, with the total slope coefficient for territorial firms nearly three times that of worldwide firms. In terms of economic magnitude, the estimate of the coefficient on C of -0.47 in Model 2 indicates that as a worldwide subsidiary's tax incentive goes from 0.1 to 0.2 (i.e., its incentive to shift out becomes greater), the natural log of its pretax income (in thousands of U.S. dollars) will decrease by 0.047. At the mean $LogPLBT$ of 7.84, this translates into a reduction in reported income of $117,000 (from $2,540,000 to $2,423,000), or 4.6%. The estimate of the coefficient of $TT * C$ of -0.88 indicates that as a territorial subsidiary's tax incentive goes from 0.1 to 0.2, the natural log of its pretax income will decrease by 0.135 (-0.047 + -0.088 = -0.135), which translates to a reduction in pretax income of 12.6% ($321,000).

On the surface, these results provide a clear answer to the primary question of the study: territorial multinationals shift more income than do worldwide multinationals with the same tax incentives and opportunities. The difference is both statistically and economically significant. To test the sensitivity of this result to the assumptions made, I conduct additional tests using alternate designs.

5.1.2 Within-country tests

One limitation of the research design employed in the previous test is that the primary variables (C and $TT * C$) are country-level variables and could be correlated with other

[42] Recall that TT is an indicator variable equal to 1 if the global ultimate owner of the subsidiary in the observation would be exempt from domestic tax on the subsidiary's income if the dividend were paid directly from the subsidiary to the GUO.

characteristics of the country that could be driving the result. To address this concern, I conduct a second test of H1 by estimating Equation 1 on time series data for a country that changed from a worldwide system to a territorial one. Prior to Japan and the UK (post-change data for which are not yet available), the last country to make such a change was Norway, which changed from fully taxing to fully exempting income from most countries on January 1, 2004. To test for differences in income shifting around this change, I collect data for all Norwegian Global Ultimate Owners and their subsidiaries for the years 2000 to 2005, inclusive, and estimate Equation 1. Unfortunately, there are data for only 91 Norwegian multinationals over this period, limiting the statistical power of the tests. I rename the territorial indicator variable (TT) $POST03$ for consistency with a subsequent test. $POST03$ is equal to 1 for observations in years after 2003 (i.e., years in which Norwegian multinationals were subject to a territorial regime). Results are presented in the left half of Table 5.

The column headings of Table 5 indicate the subsample that is used in the respective tests. The first two columns use all available observations, with the first establishing that the sample firms engage in tax-motivated income shifting (as evidenced by the negative coefficient on C), and the second introducing the $POST03$ split. The coefficient on $POST03 * C$ is negative, indicating that the sample firms shifted more when under a territorial regime than when under a worldwide regime. The estimate is not statistically significant. As the statistical power of the sample to identify differences in the two periods is limited, I estimate the model on subsamples which exclude observations in the transitional period on the assumption that they may be muting differences if firms have altered their behavior in anticipation of the change or took time after the change to implement changes. The third column excludes 2003, the year prior to the change. The coefficients on both C and

the interaction term remain negative, though neither is statistically significant. Similar results are reported in the final column when both the year prior to and the year following the change are excluded.

The primary concern with this time-series test is that the interaction term is simply capturing an increasing time trend in tax-motivated income shifting. My ability to conduct reliable robustness tests (e.g., regressions by year) using these Norwegian data is limited by the small sample size. To address this concern, I repeat the test using all available data for Swedish multinationals in the same period. I choose Sweden because it is a Scandinavian country with the same corporate tax rate (28%, identical to that of Norway) over the period, it had a territorial system for the entire period, and it has a large amount of data available. If the coefficient estimate on the interaction term in the Norway sample is capturing a time effect, the same result should be obtained in the Sweden sample.

The results are presented in the right half of Table 5. The coefficient estimate for C is negative in all three subsamples, indicating that Swedish multinationals engaged in tax-motivated income shifting in 2000 – 2003. The estimate on $POST03 * C$ is positive and insignificant, indicating there was not an increase in tax-motivated income shifting after January 1, 2004. This result provides indirect support that the negative coefficient in the Norway sample is evidence of an increase in shifting following the adoption of a territorial system.

5.2 Robustness of results for H1

5.2.1 Controlled foreign corporation rules

The main variable of interest in the tests described in Table 4 is the interaction of the territorial indicator variable (TT) and the tax variable (C). As noted above, the fact that TT is

a country-level variable is problematic if it is correlated with other factors that could also explain variation in reported income. Most countries impose restrictions on their multinationals intended to limit their ability to avoid tax in abusive ways. The most common such restriction is a controlled foreign corporation (CFC) rule. CFC rules allow the taxing authority to override the otherwise applicable tax law on an entity-by-entity basis when certain specific conditions are met.[43] A binary division of countries along this dimension is not straightforward because the trigger points for CFC rules vary across countries. However, accepting the inherent imprecision, I code an indicator variable, $NOCFC = 1$ if the country does not have explicit CFC rules.[44] I first substitute $NOCFC$ for TT in Equation 1 and then augment the original Equation 1 with $NOCFC$ and its interaction terms to determine if the results presented in Table 4 are sensitive to this additional control. I expect multinationals based in countries with no CFC rules to shift more than those in countries with CFC rules (i.e., that the coefficient estimate on $NOCFC * C$ will be negative). Results are presented in Table 6.

Model 1 is a duplicate of Model 3 from Table 4 and is included for comparison purposes. Model 2 presents the results of estimating Equation 1 with $NOCFC$ substituted for TT. The estimate on C is -0.71 and significant, indicating that multinationals domiciled in countries with CFC rules shift income for tax purposes. The estimate of the coefficient on $NOCFC * C$ is also negative (-1.19) and significant, indicating that, as predicted,

[43] For example, France's law contains a CFC provision stating that income earned in a low-tax foreign country may be ineligible for the 95% exemption if certain conditions are met (e.g., the effective tax rate is less than 2/3 of the French rate). Such determinations are made on an entity-by-entity basis rather than a country-by-country basis. That is, a French parent could have two subsidiaries in Bermuda and one of them could trigger the CFC rule and one of them could not.

[44] I use $NOCFC$ rather than its complement, CFC (=1 if the country has CFC rules), so that predicted signs will be consistent with those of TT.

multinationals not subject to CFC rules engage in more income shifting. To determine whether the lack of CFC rules explains the difference in the shifting of worldwide and territorial firms documented in Table 4, I next include both TT and $NOCFC$ in the same regression. Results are presented in Model 3 of Table 6.[45] The coefficient estimate on $TT * C$ remains negative (-0.60) and significant, evidence that the difference in shifting between territorial and worldwide firms found in the main tests is robust to controlling for the presence of CFC rules.

5.2.2 Data coverage

As discussed in Section 4.1.1, a corporation will not be included in the data which is aggregated and then used to calculate C if it does not have operating revenue reported in Orbis. To ensure that such missing data do not affect inferences, I calculate two proportions for each observation: the number of corporations ultimately controlled by the GUO reporting positive operating revenue as a fraction of the total number of subsidiaries ultimately controlled by the GUO, and the number of countries in which the GUO has ultimately-controlled corporations with positive operating revenue as a fraction of the total number of countries in which the GUO has ultimately-controlled corporations. The mean (median) values of the two proportions in the full sample are 0.47 (0.40) and 0.68 (0.67), respectively. In untabulated tests, I restrict the sample to observations with various thresholds for both the subsidiary-level and country-level proportions. Inferences remain unchanged up to the 0.50 (0.75) threshold for the subsidiary-level (country-level) proportion. Beyond these thresholds

[45] Because there are fewer than 200 observations that have TT =0 and $NOCFC$ =1 (i.e., I do not have enough observations from worldwide countries that do not have CFC rules), I exclude $NOCFC$ and $NOCFC * C$ from the model and am effectively comparing the income shifting of three groups: worldwide firms, territorial firms subject to CFC rules, and territorial firms not subject to CFC rules.

(i.e., when only GUOs having data for at least 50% of their total subsidiaries or 75% of the countries in which it operates), the estimate of the coefficient on $TT * C$ becomes positive and is not statistically significant.

5.2.3 Regressions by parent country

In grouping countries by their taxation of foreign dividends for the tests reported in Table 4, an assumption was made that there were no fundamental differences in the countries that would affect the propensity to shift income.[46] To test the validity of this assumption, I estimate Equation 1 (without TT and $TT * C$) by country for parent countries having at least 600 observations. Results are presented in Table 7. The first column (Full sample) uses the full sample (i.e., not just observations from the nine countries reported in the table) and is included for comparison purposes.[47] The remaining columns present results using only observations of multinationals domiciled in the country listed in the column heading. For eight (seven) of the nine countries, the estimate of the coefficient on C is negative (negative and significant), which is interpreted as evidence of tax-motivated income shifting. Only Japan does not have a negative estimate for C. In fact, the estimate for Japan is positive and significant.[48] The estimates of C range from -2.04 (Switzerland) to 0.79 (Japan), with a mean of -0.94 and a standard deviation of 0.89.[49] These estimates are consistent with multinationals domiciled in all countries except Japan engaging in tax-motivated income

[46] For example, if a significant portion of the territorial subsample was comprised of firms domiciled in countries that allow extreme amounts of income shifting, the difference being attributed to the worldwide/territorial split may be driven by those extreme observations.

[47] This test is identical to that reported in Model 1 of Table 4 except that it includes $STABILITY$ and LAW.

[48] As discussed by Collins et al (1998), a positive coefficient is not evidence of shifting income to pay more tax, but rather is evidence that the non-tax factors affecting income shifting dominate the tax factors.

[49] With Japan excluded, the mean is -1.02 and the standard deviation is 0.58.

shifting. Because Japan represents 20% (7%) of the worldwide (total) observations in the sample, it could be driving the observed difference in shifting across the two groups, and thus requires further investigation.

5.3 The case of Japan

The finding that Japan is an outlier in tax planning is consistent with the finding in Markle and Shackelford (2010) that Japanese multinationals have had higher effective tax rates than multinationals in other countries for the last two decades. Unfortunately, Markle and Shackelford (2010) find no explanation for how or why Japan has remained an outlier among the major economies of the world for so long and suggest that future research on the topic is needed. I first examine the data to determine if there might be something different about the Japanese sample that was drawn. As reported in Panel D of Table 2, the distribution of the 1,104 Japanese observations in the sample is consistent with those of the other parent countries. The correlation between the percentage of observations in each country for the whole sample and for Japan when sample subsidiaries in Japan are excluded (i.e., between the %All column and the Japan column) is 86%, indicating that there is nothing anomalous about the distribution of Japanese observations in the sample.[50]

I next investigate two broad categories of country-level characteristics that could drive differences in observed income shifting: transfer pricing rules and culture.

[50] In untabulated tests, I estimate Equation 1 on a subsample that includes only foreign subsidiaries. Inferences from these tests are unchanged from those from the tests on the full sample.

5.3.1 Transfer pricing rules

Most countries adopt transfer pricing rules that are based on the OECD transfer pricing guidelines (OECD, 2009), which recommend the arm's length method as the general basis for determining appropriate transfer prices.[51] However, while countries have the OECD guidelines as a common starting point, they can differ in both the application and enforcement of their transfer pricing rules as a whole. In concurrent research, Mescall (2010) develops a 16-point index which he uses to measure the strictness of a country's transfer pricing rules. Because he observes countries clustering at two points on the index, he reduces the index to an indicator variable equal to 1 if the country has strict transfer pricing practices, 0 otherwise. For 2005, 15 of the 27 countries in his sample are coded as having strict practices. Japan is one of the 12 considered to have unstrict practices.

To determine if these differences across parent countries may affect the inferences of the main tests, I code an indicator variable, $UNSTRICT$ =1 if the parent country is judged to have unstrict transfer pricing practices by Mescall (2010). I include $UNSTRICT$ and $UNSTRICT * C$ in Equation 1 and estimate the model on the full sample and a subsample which excludes observations having Japan as the parent company. Results are presented in Table 8. The first pair of columns presents the results of estimating on the full sample and the non-Japan subsample without the new indicator variable. With Japan excluded, the coefficient on $TT * C$ remains negative and significant, but the relative magnitudes of the

[51] As the name suggests, the arm's length method uses the price that unrelated and self-interested parties would agree on as the basis for determining the appropriateness of a price used for transfers among commonly-controlled entities. For further details, see OECD (2009).

coefficients on C (-0.95) and the total slope coefficient on C for territorial firms (-0.95 + -0.51 = -1.46) change substantially from those in the full sample.

Moving to the middle pair of columns in Table 8, which present the results of estimating the model including $UNSTRICT$ and $UNSTRICT * C$ on the two samples, we see that the inferences taken from the estimates of the coefficients on C and $TT * C$ do not change when the control for transfer pricing practices is included. In neither sample is the estimate on $UNSTRICT * C$ statistically significant. I conclude from this that the strictness of transfer pricing rules, as measured by Mescall (2010), does not affect the relative amounts of income shifting of the two groups.

There is a difference in Japanese tax law that may partially explain the lack of evidence of shifting using my research design. As documented by Gramlich, et al (2004), Japanese law dictates that arm's length prices must be used for transactions between Japanese companies and their foreign affiliates, but does not have the same requirement for transactions between domestic Japanese companies. Gramlich, et al (2004) hypothesize and find that Japanese firms that are members of keiretsu engage in more within-Japan shifting than independent firms.[52] It is possible, then, that Japanese firms engage in less cross-jurisdiction income shifting because they have more domestic shifting opportunities than firms in other countries. Unfortunately, I do not have access to the data necessary to test this hypothesis.

[52] From Gramlich, et al (2004): "Keiretsu … represent diversified groups of manufacturing and trading firms that share the same financial institutions and adopt coordinated business strategies. … keiretsu members benefit from distribution and production arrangements, dominant access to markets, and low-cost flexible financing."

5.3.2 Cultural differences

Beyond any statutory restrictions countries impose on the practices of their multinational corporations, anecdotal evidence suggests that there may be cultural differences between countries (and between Japan and the rest of the countries in the study in particular) that could drive differences in observed income shifting.[53] Acknowledging that concepts such as culture are difficult to measure, I again use as proxies the World Governance Indicators (WGI) produced by the World Bank (Kaufmann et al, 2008). Kaufmann et al (2008) calculate an index running from -2.5 to 2.5 for six variables such that a higher value indicates better governance. I multiply their values by -1 so that predicted signs are consistent with my previous tests. I run the test with each of their six variables but, as results are qualitatively the same using any of the six, I report only the results using $CORRUPT$.[54] Results are reported in the last pair of columns of Table 8.

As with the results when the transfer pricing strictness variable was included, the inferences about differences between worldwide and territorial firms are unchanged when this additional control is included. The sign on $CORRUPT * C$ is negative, indicating that tax-motivated income shifting is increasing in the level of corruption in the parent country, but it is not statistically significant.

[53] According to a Library of Congress Country Study, Japanese culture highly values both loyalty and respect for authority. "Leadership stemmed from the government and authority in general, and business looked to government for guidance. These attitudes, coupled with the view of the nation as a family, allowed government to influence business, and business worked hard not only for their own profits but also for national well-being. Thus, the relationship between government and business was as collaborators rather than as mutually suspicious adversaries." (Library of Congress, 1994).

[54] The following is the definition of the corruption variable taken directly from Kaufmann et al (2007): "measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests." As noted, I multiply their value by -1 so that the value of the $CORRUPT$ in my tests is increasing in the level of corruption in the parent country.

Taken as a whole, the results in Table 8 support the conclusion that territorial firms shift more income than worldwide firms, regardless of country-level differences in cultural norms. Unfortunately, these additional tests do not provide an explanation for why the income shifting of Japanese multinationals differs from that of all other countries. In fact, these tests provide further evidence that the lack of income shifting in Japan is anomalous; despite being subject to less strict transfer pricing rules than firms that shift income for tax purposes, Japanese firms do not show evidence of shifting income for tax purposes. I leave further investigation of this for future research.

5.4 Tests of Hypothesis 2

My second hypothesis states that the difference in the tax-motivated income shifting of territorial and worldwide firms is decreasing in the reinvestment opportunities in the foreign country. This prediction is based on the assumption that worldwide firms have more incentive to shift income when the shifted income can be reinvested abroad (and thus avoid the home country tax liability) while territorial firms' incentive is unrelated to what happens to the income after it is shifted. To test this hypothesis, I calculate the asset growth of the subsidiary (where, as in previous tests, all entities within a country are aggregated into one "subsidiary) as a proxy for reinvestment opportunities. Assets are defined as total assets less cash. For the tabulated tests, I use the asset growth from the end of 2004 to the end of 2007. In untabulated results, I use growth in 2006, growth in 2005-2006, and growth in 2007 and inferences are unchanged.

Using the calculated asset growth, I sort observations within parent countries both in quintiles and above/below the median. I then code three indicator variables: $ABOVE = 1$ if

the asset growth is above the median; $TOPQ$ = 1 if the asset growth is in the top quintile; and $BOTTOMQ$ = 1 if the asset growth is in the bottom quintile. I then include each of the three in Equation 1 in turn to test H2. Focusing first on the split at the median, if H2 is correct, four things should be true. First, the coefficient on $TT * C$ should be negative, indicating that, for firms with below-median reinvestment opportunities, territorial firms shift more than worldwide firms. Second, the coefficient on $C * ABOVE$ should be negative, indicating that worldwide firms with more investment opportunities shift more. Third, the sum of $C * ABOVE$ and $TT * C * ABOVE$ should be zero, indicating that reinvestment opportunities do not affect the income shifting for territorial firms. Fourth, the sum of $TT * C$ and $TT * C * ABOVE$ should be zero, indicating that, for firms with more reinvestment opportunities, there is no difference in the income shifting of worldwide and territorial firms. Predictions are the same when $TOPQ$ is substituted for $ABOVE$. When $BOTTOMQ$ is substituted for $ABOVE$, the predicted sign on $C * BOTTOMQ$ is positive and the predicted sign on the sum of $TT * C$ and $TT * C * BOTTOMQ$ is negative.

Results are presented in Table 9.[55] Consistent with predictions, while there is a significant different in the income shifting of territorial and worldwide firms with below-median reinvestment opportunities (as evidenced by the estimate of -1.23 on $TT * C$), there is no difference in the income shifting of territorial and worldwide firms with above-median reinvestment opportunities: the F-statistic for the difference of the total slope coefficients presented below the table is not statistically significant. As a lack of statistical significance is

[55] Results are presented using the full sample. When the test is repeated excluding Japanese parents (untabulated), inferences remain unchanged using the median test. When the top quintile is split out, all inferences remain except that the coefficient on $C * TOPQ$ is not statistically significant. When the bottom quintile is split out, the sum of $TT * C$ and $TT * C * BOTTOMQ$ is not statistically significant.

not conclusive evidence of a lack of difference, the other two tests lend additional support to the conclusion. When the top quintile is split out, all inferences remain the same as when the split is done at the median. When the bottom quintile is split out, the F-statistic for the difference is strongly significant, providing more direct evidence that the difference in shifting behavior of the two groups is affected by the opportunity to leave the shifted income abroad.

5.5 Tests of Hypotheses 3a, 3b and 3c

Hypothesis 3, taken as whole, is similar to H2 in that it is driven by the prediction that the cash constraints of a worldwide firm affect its incentive to shift income for tax purposes. The difference in this setting from that of H2 is that the prediction for the territorial firms is that they also are affected by cash constraints, but in the opposite direction. In this case, an association between the difference in shifting of the two groups and the cash constraints of the parent could be driven by differences in either or both groups. That is the reason the hypothesis is divided into three parts.

As a proxy for the domestic cash constraints of the parent, I calculate the domestic leverage ((Current liabilities + Non-current liabilities)/Shareholders' equity) for each parent by aggregating all unconsolidated data in the home country. I then rank firms within countries in quintiles and above and below the median based on this calculated ratio and code the same three indicator variables, $ABOVE$, $TOPQ$ and $BOTTOMQ$. For the split at the median, the following are the predictions for the coefficients that come out of the separate hypotheses. H3a predicts that the coefficient on $C * ABOVE$ will be positive, indicating that worldwide firms needing cash at home sooner shift less. H3b predicts that the sum of

$C * ABOVE$ and $TT * C * ABOVE$ will be negative, indicating that territorial firms needing cash at home shift more income for tax purposes. H3c predicts that the sum of $TT * C$ and $TT * C * ABOVE$ should be negative, indicating that, among firms needing cash at home, territorial firms shift more than worldwide firms.

Results are presented in Table 10.[56] The sample used for these tests is smaller because not all parent firms have the necessary data for calculating domestic leverage.[57] The estimate of the coefficient on $C * ABOVE$ is positive (0.67), consistent with the prediction of H3a, but is not statistically significant. As predicted in H3b, the sum of the estimates for $C * ABOVE$ and $TT * C * ABOVE$ is negative and significant, as shown in the first F-test below the table. Finally, the sum of $TT * C$ and $TT * C * ABOVE$ is negative and significant, indicating that the difference between the shifting of the groups predicted in H3c exists.

Taken as a whole, the results of the tests of Hypotheses 2 and 3 support the conclusion that worldwide firms with the opportunity and ability to leave shifted earnings abroad indefinitely shift as much income as their territorial counterparts. These tests show that the differences between the average firms in the two groups identified in the main tests are driven by differences in the subsamples of firms facing domestic cash constraints or weaker foreign reinvestment opportunities.

[56] As in Table 9, results are presented using the full sample. When the test is repeated excluding Japanese parents (untabulated), all inferences remain unchanged except that, in the top quintile split, the coefficient on $C * TOPQ$ is statistically significant.

[57] Unfortunately, I lose a larger proportion of worldwide observations than territorial observations. In the main sample, 36% of observations are worldwide. In this sample, 28% are worldwide.

5.6 Tests of Hypothesis 4

I conclude the empirical tests in the paper by examining a possible consequence of the taxation of foreign dividends, the trapping of cash abroad. If, as shown, in the tests of H1, territorial firms shift more income to their low-tax subsidiaries, it is of interest to know if the differences in cash levels are consistent with the differences in shifting. Hypothesis 4 predicts that worldwide firms will have more cash in low-tax countries despite the fact that they shift less income to those countries. To test H4, I estimate Equation 2. To maximize available observations for this test, I form a new sample, keeping all observations with the required data for this model, regardless of whether they were in the previous sample or not.[58] Consistent with the income shifting tests, I aggregate all subsidiaries of the same GUO by country.[59] I expect the coefficient on $STATDIFF$ (the association between repatriation $TT * STATDIFF$ cost and cash level for worldwide firms) to be positive, and the sum of $STATDIFF$ and (the association between repatriation cost and cash level for territorial firms) to be zero.

Results are presented in Table 11. Because DOM_RD is missing for 42% of the observations, I estimate Equation 2 with it included (Model 1) and with it excluded (Model 2). As results are unchanged by the inclusion of DOM_RD, I focus my discussion on Model 1. The coefficient on $STATDIFF$ is positive, indicating that as the difference between the tax rates of the subsidiary and the parent increases, the worldwide subsidiary holds more cash. The coefficient on $TT * STATDIFF$ is negative and significant and the sum of $STATDIFF$

[58] Results are qualitatively the same when a subsample of the income shifting sample is used.

[59] I include Japanese parents in the sample. Inferences are unchanged when they are excluded.

and $TT * STATDIFF$ is not statistically different from zero, as indicated in the F-test below the table. These results indicate that the tax costs of repatriation lead to inefficient cash management for worldwide firms relative to territorial firms that do not face such costs.

Combining the results in the main tests with those reported in Table 11, I infer that low-tax subsidiaries of worldwide parents are recipients of less shifted income but hold more cash than similar subsidiaries of territorial parents. These results are consistent with those of Foley et al. (2007), Blouin et al. (2010), and Graham et al. (2010) and indicate that multinationals subject to worldwide tax regimes bear a dead-weight cost in the form of inefficient allocation of their resources. While territorial subsidiaries are distributing cash back to their parents, worldwide subsidiaries are holding the cash, at least in part to avoid the tax cost that would be borne if it was distributed as a dividend.

In an additional test, I further divide the territorial group into those that tax 5% of the dividend and those that fully exempt dividends to test whether the small tax cost affects repatriation decisions.[60] The results of these tests are presented in Models 3 and 4 of Table 11. The results of three separate F-tests are presented below the main table. The first test reveals that the incremental slope coefficients, $TT\_5 * STATDIFF$ and $TT\_0 * STATDIFF$, are not statistically different and the lower two tests indicate that neither of the total slope coefficients are significantly different from zero. I conclude from these tests that the imposition of tax on 5% of foreign dividends does not affect the repatriation decisions of territorial multinationals.

[60] The countries which generally tax 5% of foreign dividends are Belgium, France, Germany, Italy, and Switzerland. For this additional test, I code an indicator variable, $TT\_5 = 1$ for these countries and a second indicator variable $TT\_0 = 1$ for all other territorial countries.

6. Conclusion

The taxation of foreign commerce and the erosion of tax bases through international income shifting are subjects of ongoing and contentious debate in many countries as the increasing globalization of markets makes their consequences for national treasuries, firms and individuals more significant. This paper contributes needed empirical data to those debates by directly comparing the income shifting behaviors of multinationals subject to different systems of taxation of their foreign earnings and finding systematic differences between them.

As is true of results of any study of income shifting, my results rely on the validity of the empirical model of expected income. To the extent that actual earnings are determined by factors other than capital, labor and productivity inputs, the amount of shifted income is measured with error. Another caveat is that the sample subsidiaries in this study are heavily concentrated in Europe; it is possible that the findings are unique to subsidiaries in that region and not generalizable.

I find that multinationals domiciled in every country except Japan engage in tax-motivated income shifting and that those domiciled in territorial countries, on average, shift more income than those domiciled in worldwide countries. In more detailed tests, I find that the income shifting of worldwide firms that are able to leave the shifted income invested abroad and that of similar territorial firms are not statistically different. I also find that the low-tax subsidiaries of worldwide parents hold more cash than do those of territorial parents,

suggesting that the worldwide tax system negatively affects the efficiency of its multinationals. Taken as a whole, my findings suggest that a change from a worldwide system to a territorial one will be accompanied by an increase in income shifting by the average firm, but not by firms that have consistently reinvested foreign earnings abroad. My results also suggest that such a change would remove the inefficiency of having cash trapped in lower-tax jurisdictions.

Appendix A – Calculation of the tax variable, $C_i = \frac{1}{(1-\tau_i)} \frac{\sum_{k\neq i}^{n} \frac{B_k}{1-\tau_k}(\tau_i - \tau_k)}{\sum_{k=1}^{n} \frac{B_k}{1-\tau_k}}$

The following scenarios illustrate the calculation of *C*, its variation with its inputs, and its variation from simple rate differences. The three scenarios are identical except for the distribution of revenue across subsidiaries and assume that the parent is domiciled in the same country as Subsidiary 3 (i.e., has a 20% tax rate). Rate difference is the subsidiary's tax rate minus the parent's tax rate.

Scenario 1

Subsidiary	Tax rate	Revenue	C	Rate difference
1	0%	10	(0.19) *	(0.20)
2	10%	100	(0.12)	(0.10)
3	20%	50	0.01	-
4	30%	80	0.15	0.10
Mean	15%	60	(0.04)	(0.05)

Scenario 2

Subsidiary	Tax rate	Revenue	C	Rate difference
1	0%	10	(0.22)	(0.20)
2	10%	50	(0.15)	(0.10)
3	20%	80	(0.03)	-
4	30%	100	0.11	0.10
Mean	15%	60	(0.07)	(0.05)

Scenario 3

Subsidiary	Tax rate	Revenue	C	Rate difference
1	0%	80	(0.17)	(0.20)
2	10%	10	(0.06)	(0.10)
3	20%	100	0.04	-
4	30%	50	0.19	0.10
Mean	15%	60	0.00	(0.05)

$$* C_1 = \frac{1}{(1-0)} \frac{\frac{100}{1-0.1}(0-0.1)+\frac{50}{1-0.2}(0-0.2)+\frac{80}{1-0.3}(0-0.3)}{\frac{10}{1-0}+\frac{100}{1-0.1}+\frac{50}{1-0.2}+\frac{80}{1-0.3}} = -0.19$$

REFERENCES

Altshuler, Rosanne, 2000. Recent Developments in the Debate on Deferral. 87 Tax Notes 255.

Altshuler, Rosanne and Harry Grubert, 2001. Where Will They Go if We Go Territorial? Dividend Exemption and the Location Decisions of U.S. Multinational Corporations. National Tax Journal, Vol. LIV, No. 4.

Barrios, Salvador, Harry Huizinga, Luc Laeven and Gaetan Nicodeme, 2008. International Taxation and Multinational Firm Location Decisions. Tilburg University Working Paper, October 22.

Benassy-Quere, Agnes, Lionel Fontagne and Amina Lahreche-Revil, 2000. Foreign Direct Investment and the Prospects for Tax Co-ordination in Europe. CEPII, Document de travail no 2000-06.

Blouin, Jennifer, Leslie Robinson and Jeri Seidman, 2009. Income Shifting in U.S.-Based Multinational Firms. Wharton/Dartmouth/Texas Working Paper.

Blouin, Jennifer, Linda Krull and Leslie Robinson, 2010. Is U.S. Multinational Intra-Firm Dividend Policy Influenced by Reporting Incentives?. Wharton/Dartmouth/Oregon Working Paper.

Clausing, Kimberly A., 2009. The Consequences of Territorial and Worldwide Systems of International Taxation. Reed College Working Paper.

Collins, Julie, Deen Kemsley and Mark Lang, 1998. Cross-jurisdictional Income Shifting and Earnings Valuation. Journal of Accounting Research, Vol. 36, No. 2, pp. 209-229.

de Mooij, Ruud A. and Sjef Ederveen, 2003. Taxation and Foreign Direct Investment: A Synthesis of Empirical Research. International Tax and Public Finance, 10, 673-693.

Devereux, Michael P. and Giorgia Maffini, 2007. The Impact of Taxation on the Location of Capital, Firms and Profit: A Survey of Empirical Evidence. Oxford University Centre for Business Taxation Working Paper Series, WP 07/02, Said Business School, Oxford.

Dischinger, Matthias, 2009. Profit Shifting by Multinationals and the Ownership Share: Evidence from European Micro Data. University of Munich Working Paper, November 2.

Dischinger, Matthias and Nadine Riedel, 2008. Corporate Taxes, Profit Shifting and the Location of Intangibles within Multinational Firms. University of Munich Working paper, June 9.

Drucker, Jesse, 2010. Companies Dodge $60 Billion in Taxes Even Tea Party Condems. Bloomberg BusinessWeek, June 28.

Dyreng, Scott D. and Bradley P. Lindsey, 2009. Using Financial Accounting Data to Examine the Effect of Foreign Operations Located in Tax Havens and Other Countries on U.S. Multinational Firms' Tax Rates. Journal of Accounting Research, Vol. 47 No. 5, 1283-1316.

Foley, C. Fritz, Jay C. Hartzell, Sheridan Titman, and Garry Twite, 2007. Why do firms hold so much cash? A tax-based explanation. Journal of Financial Economics 86, 579-607.

Gordon, Roger H. and James R. Hines Jr., 2002. International Taxation. NBER Working Paper 8854, April.

Government Accountability Office, 2008. Effective Tax Rates Are Correlated with Where Income Is Reported. Report to the Committee on Finance, U.S. Senate, GAO-08-950.

Government Accountability Office, 2009. Study Countries That Exempt Foreign-Source Income Face Compliance Risks and Burdens Similar to Those in the United States. Report to the Committee on Finance, U.S. Senate, GAO-09-934.

Graham, John, Michelle Hanlon and Terry Shevlin, 2009. The Effect of Financial Reporting on the Location, Reinvestment, and Repatriation Decisions of Multinational Companies. MIT Working paper.

Gramlich, Jeffrey D., Piman Limpaphayom and S. Ghon Rhee, 2004. Taxes, keiretsu affiliation, and income shifting. Journal of Accounting and Economics 37, 203-228.

Grubert, Harry and John Mutti, 2001. Taxing International Business Income: Dividend Exemption versus the Current System. The AEI Press.

Hajkova, Dana, Guiseppe Nicoletti, Laura Vartia and Kwang-Yeol Yoo, 2006. Taxation, Business Environment and FDI Location in OECD Countries. Working paper, June.

Hartman, David G., 1985. Tax Policy and Foreign Direct Investment. Journal of Public Economics 26, pp. 107-121.

Hines, James R. Jr., 1996. Altered States: Taxes and the Location of Foreign Direct Investment in America. The American Economic Review, Vol. 86, No. 5, pp. 1076-1094.

Hines, James R. Jr. and Eric M. Rice, 1994. Fiscal Paradise: Foreign Tax Havens and American Business. The Quarterly Journal of Economics.

Huizinga, Harry and Luc Laeven, 2008. International profit shifting within multinationals: A multi-country perspective. Journal of Public Economics 92, 1164-1182.

Huizinga, Harry P. and Johannes Voget, 2009. International Taxation and the Direction and Volume of Cross-Border M&As. The Journal of Finance, Vol. LXIV, No. 3.

Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi, 2008. Governance Matters VII: Aggregate and Individual Governance Indicators 1996-2007. The World Bank Development Research Group, Macroeconomic and Growth Team & World Bank Institute Global Governance Program, June.

Klassen, Kenneth J. and Stacie K. Laplante, 2009. The Effect of Financial Reporting and Foreign Investment Opportunities on Cross-Jurisdictional Income Shifting. University of Waterloo and University of Georgia Working Paper, October.

Library of Congress, 1994. Country Study: Japan. http://lcweb2.loc.gov/frd/cs/jptoc.html. Last accessed July, 2010.

Markle, Kevin S. and Douglas A. Shackelford, 2010. Do Multinationals or Domestic Firms Face Higher Effective Tax Rates? University of North Carolina Working Paper.

Mescall, Devan, 2010. How do transfer pricing policies affect premia in cross-border mergers and acquisitions? University of Hawaii at Manoa working paper.

Organization for Economic Co-operation and Development, 2009. Transfer Pricing Guidelines Multinational Enterprises and Tax Administrations 2009. OECD, Paris.

Samuels, John M., 2009. American Tax Isolationism. Tax Notes, June 29.

Scholes, M., Wolfson, M., Erickson, M., Maydew, E., Shevlin, T. 2009. Taxes and business strategy: A planning approach (4th edition), Pearson Prentice Hall, Upper Saddle River, NJ.

Slemrod, Joel, 1990. Tax Effects on Foreign Direct Investment in the U.S.: Evidence from a Cross-country Comparison. In Taxation in the Global Economy, Assaf Razin and Joel Slemrod, editors. The University of Chicago Press.

Smart, Michael, 2010. Repatriation taxes and foreign direct investment: Evidence from tax treaties. University of Toronto working paper.

Sullivan, Martin, 2008. U.S. Multinationals Shifting Profits Out of the United States. Tax Notes, March 10.

Taxes – The Tax Magazine, 2010. In Search of a 21st Century U.S. Tax System, a transcript of the proceedings of the 11th Annual Tax Policy & Practice Symposium. CCH, June.

Voget, Johannes, 2008. Headquarter Relocations and International Taxation. Tilburg University Working Paper, April 17.

Wijeweera, Albert, Brian Dollery and Don Clark, 2007. Corporate tax rates and foreign direct investment in the United States. Applied Economics 39, 109-117.

Table 1 – Sample countries

Country	Statutory rate	Parents	Sample subsidiaries	Common-parent subsidiaries
Territorial				
Australia	30%	30		36
Austria	25%	111	204	551
Belgium	34%	231	871	1,196
Bermuda	0%	18		20
Bolivia	25%			1
Canada	32%	23		30
Cayman Islands	0%	8		10
Croatia	20%	3	137	180
Czech Republic	24%		579	725
Denmark	28%	278	484	969
Estonia	23%	20	227	366
Finland	26%	108	484	751
France	34%	386	1,883	2,854
Germany	40%	579	1,434	2,167
Hong Kong	18%	3		4
Hungary	20%	5	200	293
Iceland	18%	10	4	21
Italy	37%	372	1,193	1,677
Kuwait	55%	3		3
Latvia	15%		6	157
Lithuania	19%	3		137
Luxembourg	30%	65	61	172
Malaysia	28%	2		4
Netherlands	26%	159	311	716
Netherlands Antilles	3%	6		6
Norway	28%	86	288	1,162
Panama	30%			2
Singapore	20%	12		187
Slovak Republic	19%	3	215	309
Slovenia	25%	4	14	17
South Africa	37%	11		26
Spain	33%	297	1,542	2,118
Sweden	28%	622	1,167	1,702
Switzerland	16%	204	9	233
Turkey	20%	13		59
United Arab Emirates	50%	3		3
Uruguay	30%			1

Country	Statutory rate	Parents	Sample subsidiaries	Common-parent subsidiaries
Worldwide				
Argentina	35%			7
Brazil	32%	5		15
Bulgaria	10%		102	136
Chile	17%			10
China	33%	3		309
Colombia	34%	1		2
Cyprus	10%	4		4
Ecuador	25%		3	3
Greece	29%	36		342
India	43%	23		99
Indonesia	30%			2
Ireland	13%	42	1	551
Jamaica	33%			1
Japan	43%	372	261	541
Liechtenstein	20%	3		3
Malta	35%			1
Mexico	29%	4		4
New Zealand	33%	3		9
Peru	30%			17
Poland	19%	28	842	1,253
Portugal	25%	37	505	737
Romania	16%		193	252
Russia	24%	4		354
Saudi Arabia	20%	4		4
South Korea	28%	45	238	300
Taiwan	25%	13		20
Trinidad and Tobago	25%			1
Ukraine	25%		48	83
United Kingdom	30%	470	2,040	3,364
United States	40%	802		1,224

This table reports summary statistics for all countries included in the study. The first column reports the statutory tax rates (which include sub-national taxes for a representative firm in the country) used for each country. Rates are current as of January 1, 2007. The Parents column reports the number of unique parents domiciled in the given country that have subsidiaries in the sample. The Sample subsidiaries column reports the number of sample observations having subsidiaries domiciled in the given country. The Common-parent subsidiaries column reports the number of subsidiaries domiciled in the country that contribute to the calculation of *C*, the tax variable. The sample subsidiaries are a subset of the common-parent subsidiaries.

Table 2 – Descriptive statistics

Panel A – Full sample by subsample

	N	Mean	Median	Max	Min	Stdev	
Territorial							
Number of parents	3,721						
Log(Pretax income)	9,962	7.20	7.18	16.08	0.00	2.36	
C	9,962	-0.02	-0.01	0.34	-0.31	0.08	
Log(Compensation)	9,962	8.20	8.14	16.06	0.00	2.05	
Log(Tangible fixed assets)	9,962	7.09	7.17	17.53	0.00	2.95	
Log(Value added)	9,962	10.39	10.48	18.03	2.26	1.46	
NOCFC	9,962	0.26	0.00	1.00	0.00	0.44	
Stability	9,962	0.69	0.61	1.59	-0.90	0.35	
Rule of law	9,962	1.24	1.38	2.06	-1.02	0.61	
Worldwide							
Number of parents	1,890						
Log(Pretax income)	5,584	7.84	7.79	17.32	0.00	2.30	*
C	5,584	-0.03	-0.02	0.35	-0.35	0.09	*
Log(Compensation)	5,584	8.74	8.67	15.82	0.00	1.91	*
Log(Tangible fixed assets)	5,584	7.46	7.46	18.06	0.00	3.03	*
Log(Value added)	5,584	10.76	10.57	18.03	3.26	1.96	*
NOCFC	5,584	0.05	0.00	1.00	0.00	0.21	*
Stability	5,584	0.67	0.61	1.59	-0.90	0.30	*
Rule of law	5,584	1.29	1.38	2.06	-1.02	0.56	*

Panel A reports summary statistics for the two subsamples of the main sample. All data are for the 2006 calendar year. Log(Pretax income) is the natural logarithm of profit before income tax expense (in thousands of dollars). C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). Log(Labor costs) is the natural logarithm of the compensation expense (in thousands of dollars) of the subsidiary. Log(Tangible fixed assets) is the natural logarithm of the tangible fixed assets (in thousands of dollars) of the subsidiary. Log(Value added) is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *NOCFC*=1 if the country does not have controlled foreign corporation rules; 0 otherwise. Stability and Rule of law are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). Stability is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." Rule of law is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

* Indicates means are different at the 5% level.

Panel B – Sample by subsidiary country

Subsidiary country	N	# parent countries	%Territorial	C	Log(PLBT)	Log(Comp)	Log(Assets)	Log(Value Added)	NOCFC	Stability	Rule of law
Austria	204	24	0.71	(0.09)	7.94	9.16	8.02	8.89	0.27	1.03	1.85
Belgium	871	28	0.67	0.02	7.61	8.75	7.26	9.03	0.35	0.79	1.39
Bulgaria	102	21	0.70	(0.22)	6.76	6.63	6.96	10.36	0.38	0.38	(0.19)
Croatia	137	22	0.75	(0.13)	6.73	7.21	6.79	10.67	0.31	0.41	(0.05)
Czech Republic	579	37	0.66	(0.10)	6.94	7.67	7.10	11.49	0.26	0.87	0.75
Denmark	484	25	0.71	(0.03)	7.52	8.67	6.99	10.61	0.11	0.86	1.95
Estonia	227	19	0.87	(0.07)	5.82	6.33	5.54	9.71	0.07	0.76	0.94
Finland	484	24	0.76	(0.05)	6.65	7.76	5.75	8.36	0.11	1.47	1.96
France	1,883	42	0.65	0.02	7.35	8.77	7.03	10.58	0.20	0.51	1.38
Germany	1,434	38	0.59	0.08	8.29	9.41	8.11	10.82	0.17	0.92	1.73
Hungary	200	23	0.73	(0.14)	6.72	7.46	7.09	13.18	0.25	0.83	0.80
Italy	1,193	36	0.68	0.06	7.34	8.44	7.16	10.29	0.18	0.42	0.34
Japan	261	14	0.05	0.06	9.70	8.63	10.50	16.36	0.02	1.10	1.38
Luxembourg	61	13	0.75	(0.04)	7.52	8.34	6.83	6.43	0.38	1.50	1.81
Netherlands	311	25	0.53	(0.09)	8.51	8.85	7.75	9.53	0.22	0.80	1.72
Norway	288	19	0.80	(0.03)	7.96	8.72	6.89	10.73	0.11	1.18	2.00
Poland	842	34	0.72	(0.15)	6.66	7.03	6.72	11.28	0.22	0.33	0.28
Portugal	505	27	0.69	(0.09)	6.42	7.40	6.49	8.17	0.14	0.91	0.94
Romania	193	21	0.67	(0.17)	6.59	6.98	7.30	11.72	0.30	0.23	(0.20)
Slovak Republic	215	24	0.73	(0.14)	6.33	6.96	6.90	10.63	0.30	0.69	0.41
South Korea	238	19	0.34	(0.08)	8.48	8.52	8.48	14.98	0.12	0.41	0.74
Spain	1,542	35	0.70	(0.01)	7.05	8.22	6.99	9.95	0.14	0.17	1.04
Sweden	1,167	31	0.79	(0.03)	7.07	7.95	6.33	11.29	0.10	1.17	1.88
United Kingdom	2,040	44	0.44	(0.04)	8.02	9.19	7.88	10.33	0.17	0.61	1.70

Panel B reports means of variables grouped by subsidiary country. Countries with fewer than 50 observations are not reported. N is the number of observations in which the given country is the subsidiary country. # parent countries reports the number of different parent countries having at least one subsidiary in the country. %Territorial reports the percentage of subsidiaries in the given country that are controlled by parents in territorial countries. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). Log(Pretax income) is the natural logarithm of profit before income tax expense (in thousands of dollars). Log(Labor costs) is the natural logarithm of the compensation expense (in thousands of dollars) of the subsidiary. Log(Tangible fixed assets) is the natural logarithm of the tangible fixed assets (in thousands of dollars) of the subsidiary. Log(Value Added) is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *NOCFC*=1 if the country does not have controlled foreign corporation rules; 0 otherwise. Stability and Rule of law are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). Stability is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." Rule of law is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

Panel C – Sample by parent country

Parent country	N	# parents	C	Log(PLBT)	Log(Comp)	Log(Assets)	Log(Value Added)	NOCFC	Stability	Rule of law
Territorial										
Australia	80	30	(0.00)	7.32	8.11	6.75	10.17	0	0.63	1.34
Austria	300	111	(0.01)	6.92	7.82	7.50	10.59	1	0.68	0.97
Belgium	573	231	(0.03)	6.95	8.04	7.10	9.95	1	0.67	1.24
Bermuda	75	18	(0.01)	8.35	9.31	7.75	10.66	1	0.65	1.31
Canada	42	23	(0.01)	7.35	8.39	6.44	10.32	0	0.60	1.41
Denmark	653	278	(0.00)	6.63	7.60	6.20	10.64	0	0.84	1.50
Estonia	21	20	0.03	7.19	7.22	6.91	9.54	0	0.83	1.10
Finland	378	108	(0.01)	7.34	8.31	7.02	10.11	0	0.88	1.36
France	1,359	386	(0.04)	7.84	8.90	7.68	10.39	0	0.61	1.16
Germany	1,659	579	(0.05)	7.45	8.37	7.41	10.52	0	0.65	1.17
Italy	803	372	(0.03)	6.88	7.76	7.04	10.29	0	0.51	0.90
Luxembourg	139	65	(0.03)	7.76	8.50	7.59	10.17	1	0.65	1.17
Netherlands	624	159	(0.01)	7.32	8.40	7.03	10.51	1	0.69	1.24
Netherlands Antilles	22	6	0.01	6.99	8.67	7.02	10.10	1	0.61	1.20
Norway	203	86	(0.00)	7.39	8.33	7.14	10.56	0	0.82	1.52
Poland	43	28	0.01	6.83	7.26	7.81	11.01	1	0.50	0.58
Portugal	67	37	0.02	6.88	7.93	7.71	9.00	0	0.58	1.02
Singapore	21	12	0.08	6.19	7.92	5.76	10.20	1	0.53	1.34
South Africa	30	11	(0.01)	7.69	8.78	7.64	10.23	0	0.70	1.47
Spain	577	297	(0.02)	6.99	7.99	7.47	9.69	0	0.47	1.03
Sweden	1,522	622	(0.01)	6.88	7.87	6.44	10.48	0	0.92	1.53
Switzerland	714	204	(0.01)	7.08	8.35	7.02	10.63	1	0.65	1.19
Worldwide										
Greece	51	36	(0.06)	6.54	6.97	7.20	10.88	1	0.47	0.43
India	53	23	(0.03)	7.45	9.01	8.19	10.25	1	0.69	1.41
Ireland	85	42	0.03	7.59	8.73	8.29	10.08	1	0.64	1.36
Japan	1,104	372	(0.07)	7.97	8.43	7.86	11.81	0	0.74	1.34
South Korea	90	45	(0.01)	8.01	8.47	7.78	12.54	0	0.58	1.14
Taiwan	29	13	0.01	6.83	7.83	5.77	10.74	1	0.65	1.26
United Kingdom	1,148	470	(0.00)	8.07	9.03	7.75	10.50	0	0.65	1.34
United States	2,909	802	(0.02)	7.77	8.81	7.16	10.48	0	0.67	1.29

Panel C reports means of variables grouped by parent country. N is the number of observations in which the given country is the parent country. # parents reports the number of parents domiciled in the given country that have subsidiaries in the sample. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). Log(Pretax income) is the natural logarithm of profit before income tax expense (in thousands of dollars). Log(Labor costs) is the natural logarithm of the compensation expense (in thousands of dollars) of the subsidiary. Log(Tangible fixed assets) is the natural logarithm of the tangible fixed assets (in thousands of dollars) of the subsidiary. Log(Value Added) is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *NOCFC*=1 if the country does not have controlled foreign corporation rules; 0 otherwise. Stability and Rule of law are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). Stability is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." Rule of law is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

Panel D – Sample distribution across subsidiary countries

Parent country	N	% All	BELGIUM	DENMARK	FRANCE	GERMANY	ITALY	JAPAN	NETHERLANDS	SPAIN	SWEDEN	SWITZERLAND	UK	US
Subsidiary country	15,546		573	653	1,359	1,659	803	1,104	624	577	1,522	714	1,148	2,909
AUSTRIA	204	1	0	1	1	3	0	1	1	0	1	1	1	1
BELGIUM	871	6	31	3	8	3	2	3	11	1	3	4	4	7
BULGARIA	102	1	1	0	1	1	0	0	0	0	0	1	0	0
CROATIA	137	1	1	1	1	1	1	0	1	1	0	1	1	1
CZECH REPUBLIC	579	4	3	3	3	6	2	3	4	2	2	5	4	4
DENMARK	484	3	1	18	2	2	0	1	3	-	5	2	2	3
ESTONIA	227	1	0	2	1	1	-	0	1	0	5	1	1	1
FINLAND	484	3	1	5	1	1	1	1	3	-	11	2	2	3
FRANCE	1,883	12	21	8	23	12	15	9	9	10	6	16	13	13
GERMANY	1,434	9	5	6	6	19	6	13	9	3	4	11	9	10
HUNGARY	200	1	1	2	2	2	1	1	3	0	1	1	1	1
ITALY	1,193	8	4	4	8	5	34	5	8	7	3	11	5	8
JAPAN	261	2	0	-	0	0	-	20	0	-	0	0	0	1
NETHERLANDS	311	2	2	1	2	2	1	3	4	-	1	2	2	3
NORWAY	288	2	1	4	1	1	0	0	2	-	5	1	2	1
POLAND	842	5	6	6	5	10	4	3	6	3	6	6	4	5
PORTUGAL	505	3	2	1	4	3	3	2	3	21	1	3	3	2
ROMANIA	193	1	1	0	1	2	3	1	1	1	0	2	1	1
SLOVAKIA	215	1	2	1	2	2	1	1	2	-	0	1	1	1
SOUTH KOREA	238	2	1	1	1	1	0	4	1	-	0	2	1	2
SPAIN	1,542	10	6	4	11	11	14	7	9	44	4	9	9	9
SWEDEN	1,167	8	3	20	4	2	3	3	5	1	33	6	4	5
UNITED KINGDOM	2,040	13	7	7	10	9	7	18	13	6	6	11	30	17

This table reports the distribution of observations across subsidiary countries. N reports the number of observations in each subsidiary country. The top row reports the number of observations by parent country. Parent countries with fewer than 500 observations are not included. Each cell reports the percentage of the parent country's observations that are in each subsidiary country. For example, in the full sample, 1% of observations are in Austria and 6% are in Belgium, while fewer than 0.5% of the subsidiaries of Belgian parents are in Austria and 31% of them are in Belgium. - indicates that there are zero observations in the cell. A "0" indicates that the percentage in that cell is less than 0.5, but greater than 0.

Table 3 – Correlations

	LOGPLBT	*LOGASSETS*	*LOGCOMP*	*LOGVA*	*TT*	*C*	*NOCFC*	*STABILITY*	*LAW*
LOGPLBT		0.74*	0.78*	0.01	-0.13*	0.11*	-0.06*	0.05*	0.13*
LOGASSETS	0.74*		0.77*	-0.04*	-0.06*	0.08*	-0.01	-0.02	0.03*
LOGCOMP	0.79*	0.77*		-0.10*	-0.13*	0.22*	-0.04*	0.03*	0.23*
LOGVA	-0.06*	-0.14*	-0.14*		-0.11*	-0.00	-0.03	-0.04	-0.12*
TT	-0.13*	-0.05*	-0.13*	-0.06*		0.03*	0.26*	0.02	-0.05*
C	0.12*	0.09*	0.22*	-0.01	0.04*		0.06*	0.04*	0.28*
NOCFC	-0.06*	-0.00	-0.03*	-0.01	0.26*	0.06*		-0.04*	-0.07*
STABILITY	0.07*	0.01	0.07*	0.01	0.01	0.02*	-0.04*		0.63*
LAW	0.13*	0.02*	0.21*	-0.08*	-0.02*	0.19*	-0.06*	0.75*	

This table reports correlation coefficients, Pearson above the diagonal, Spearman below. *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). *LOGASSETS* is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. *LOGCOMP* is the natural logarithm of labor compensation paid by the subsidiary in 2006. *LOGVA* is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *TT* is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. *C* is the family-level tax incentive measure developed by Huizinga and Laeven (2008). *NOCFC*=1 if the country does not have controlled foreign corporation rules; 0 otherwise. *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

* indicates statistically significant at the 5% level.

Table 4 – Main results

	Prediction	(1)	(2)	(3)
INTERCEPT		-0.96**	-0.79**	-0.91**
		(0.07)	*(0.08)*	*(0.08)*
TT			-0.12**	-0.13**
			(0.02)	*(0.02)*
C	-	-1.12**	-0.50**	-0.47**
		(0.10)	*(0.16)*	*(0.16)*
*TT*C*	-		-0.97**	-0.88**
			(0.19)	*(0.19)*
LOGASSETS	+	0.23**	0.23**	0.23**
		(0.01)	*(0.01)*	*(0.01)*
LOGCOMP	+	0.68**	0.67**	0.68**
		(0.01)	*(0.01)*	*(0.01)*
LOGVA	+	0.10**	0.09**	0.09**
		(0.00)	*(0.00)*	*(0.00)*
STABILITY	+			0.31**
				(0.03)
LAW	+			-0.08**
				(0.02)
Fixed effects		*Industry*	*Industry*	*Industry*
N		15,006	15,010	15,008
Adj Rsquare		0.79	0.79	0.79

(1) $LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 C_i + \beta_3 TT_i * C_i + \beta_4 LogASSETS_i + \beta_5 LogCOMP_i + \beta_6 LogVA_i + \beta_7 STABILITY_i + \beta_8 LAW_i + \varepsilon_i$

This table reports OLS estimates of (1). *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." Model (1) pools all types of subsidiaries by excluding the indicator variables and interaction terms from the model.

Standard errors corrected for clustering at the parent level are reported in parentheses below the estimate.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.

Table 5 – Within-country test around a change in system

	Norway				Sweden			
	2000 - 2005	*2000 - 2005*	*Exclude 2003*	*Exclude 2003, 2004*	*2000 - 2005*	*2000 - 2005*	*Exclude 2003*	*Exclude 2003, 2004*
INTERCEPT	-0.40	-0.68	-0.46	-0.33	0.31	0.27	0.28	0.25
POST03		0.17*	0.18	0.19		0.09**	0.08**	0.09*
C	-3.59**	-3.01*	-2.03	-2.07	-1.88**	-1.90**	-1.91**	-1.97**
*POST03*C*		-1.19	-2.20	-2.77		0.33	0.45	0.10
LOGASSETS	0.30**	0.30**	0.33**	0.32**	0.21**	0.21**	0.21**	0.19**
LOGCOMP	0.46**	0.45**	0.42**	0.43**	0.72**	0.71**	0.71**	0.73**
LOGVA	0.10	0.11	0.10	0.10	0.05	0.05	0.04	0.04
STABILITY	-0.14	0.03	-0.03	0.12	0.11	0.17	0.22*	0.16
LAW	0.13	0.04	0.12	0.01	-0.08	-0.12	-0.16	-0.09
Fixed effects	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*
N	676	676	549	418	5,200	5,199	4,243	3,232
Adj Rsquare	0.79	0.79	0.78	0.79	0.82	0.82	0.82	0.82

$$(1a)\ LogPLBT_i = \beta_0 + \beta_1 POST03_i + \beta_2 C_i + \beta_3 POST03_i * C_i + \beta_4 LogASSETS_i + \beta_5 LogCOMP_i + \beta_6 LogVA_i + \beta_7 STABILITY_i + \beta_8 LAW_i + \varepsilon_i$$

This table reports OLS estimates of (1a) using subsamples indicated in the column headings. *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). $POST03$ is an indicator variable equal to 1 if the observation is from after 2003; 0 otherwise (for Norway, this is equivalent to TT in the original Equation 1, for Sweden, it is simply a time indicator). C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.

Table 6 – Robustness check, CFC rules

	Prediction	(1)	(2)	(3)
INTERCEPT		-0.91**	-0.99**	-0.90**
TT		-0.13**		-0.09**
NOCFC			-0.19**	
*TT*NOCFC*				-0.15**
C	-	-0.47**	-0.71**	-0.46**
*TT*C*	-	-0.88**		-0.60**
*NOCFC*C*	-		-1.19**	
*TT*NOCFC*C*	-			-0.72**
LOGASSETS		0.23**	0.23**	0.23**
LOGCOMP		0.68**	0.68**	0.68**
LOGVA		0.09**	0.10**	0.09**
STABILITY		0.31**	0.30**	0.31**
LAW		-0.08**	-0.09**	-0.09**
Fixed effects		*Industry*	*Industry*	*Industry*
N		15,008	15,011	15,010
Adj Rsquare		0.79	0.79	0.79

$$(1b)\ LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 NOCFC_i + \beta_3 TT_i * NOCFC_i + +\beta_4 C_i + \beta_3 TT_i * C_i + \beta_5 NOCFC_i * C_i + \beta_6 TT_i * NOCFC_i * C_i + \beta_7 LogASSETS_i + \beta_8 LogCOMP_i + \beta_9 LogVA_i + \beta_{10} STABILITY_i + \beta_{11} LAW_i + \varepsilon_i$$

This table reports OLS estimates of versions of (1b). *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). *NOCFC*=1 if the country does not have controlled foreign corporation rules; 0 otherwise. $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." Model (1) pools all types of subsidiaries by excluding the indicator variables and interaction terms from the model.

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.

Table 7 – Regressions by parent country

	Full sample	FRANCE (T)	GERMANY (T)	ITALY (T)	JAPAN (W)	NETHERLANDS (T)	SWEDEN (T)	SWITZERLAND (T)	UNITED KINGDOM (W)	UNITED STATES (W)
INTERCEPT	-1.09**	-0.95**	-0.75**	-0.36	-0.46	-0.17	-1.07**	-0.40	-0.81**	-0.43*
	(0.07)	*(0.27)*	*(0.22)*	*(0.49)*	*(0.34)*	*(0.44)*	*(0.23)*	*(0.35)*	*(0.31)*	*(0.19)*
C	-1.03**	-1.34**	-0.68*	-1.70**	0.79*	-1.87**	-1.35**	-2.04**	-0.68	-0.53*
	(0.10)	*(0.39)*	*(0.30)*	*(0.59)*	*(0.39)*	*(0.49)*	*(0.44)*	*(0.37)*	*(0.40)*	*(0.21)*
LOGASSETS	0.23**	0.22**	0.25**	0.21**	0.32**	0.17**	0.19**	0.21**	0.24**	0.20**
	(0.01)	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.01)*
LOGCOMP	0.68**	0.69**	0.64**	0.71**	0.48**	0.65**	0.73**	0.68**	0.69**	0.71**
	(0.01)	*(0.03)*	*(0.03)*	*(0.04)*	*(0.03)*	*(0.05)*	*(0.03)*	*(0.04)*	*(0.03)*	*(0.02)*
LOGVA	0.10**	0.10**	0.09**	0.03	0.14**	0.07*	0.07**	0.03	0.06**	0.05**
	(0.00)	*(0.02)*	*(0.01)*	*(0.04)*	*(0.02)*	*(0.03)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.01)*
STABILITY	0.31**	-0.14	0.30**	0.44*	0.22	-0.11	0.33**	0.25	0.38**	0.33**
	(0.03)	*(0.12)*	*(0.10)*	*(0.18)*	*(0.14)*	*(0.15)*	*(0.12)*	*(0.14)*	*(0.13)*	*(0.07)*
LAW	-0.09**	0.10	-0.15*	-0.12	0.10	0.17	0.02	-0.14	-0.15	-0.12**
	(0.02)	*(0.07)*	*(0.06)*	*(0.08)*	*(0.07)*	*(0.09)*	*(0.08)*	*(0.09)*	*(0.07)*	*(0.04)*
Fixed effects	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*
N	15,010	1,337	1,643	763	1,088	617	1,316	711	1,093	2,879
Adj Rsquare	0.79	0.80	0.80	0.76	0.77	0.76	0.80	0.78	0.83	0.79

$$(1d)\ LogPLBT_i = \beta_0 + \beta_1 C_i + \beta_2 LogASSETS_i + \beta_3 LogCOMP_i + \beta_4 LogVA_i + \beta_5 STABILITY_i + \beta_6 LAW_i + \varepsilon_i$$

This table reports OLS estimates of (1d) on subsamples of the parent county in the respective column. *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence."

(W) after the country name indicates the country has a worldwide tax system. (T) indicates that the country has a territorial tax system.

Standard errors corrected for clustering at the parent level are reported in parentheses below the estimate.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.

Table 8 – The effect of transfer pricing rules and culture

			UNSTRICT		*CORRUPT*	
	All	Exclude JP	All	Exclude JP	All	Exclude JP
INTERCEPT	-0.91**	-0.66**	-0.94**	-0.70**	-0.98**	-0.73**
TT	-0.13**	-0.09**	-0.14**	-0.09**	-0.16**	-0.12**
C	-0.47**	-0.95**	-0.45**	-0.80**	-0.51	-1.04**
*TT*C*	-0.88**	-0.51*	-1.05**	-0.64**	-0.90**	-0.53*
COLVAR			0.04	-0.01	-0.07**	-0.08**
*COLVAR*C*			0.37	-0.13	-0.03	-0.05
LOGASSETS	0.23**	0.21**	0.23**	0.21**	0.23**	0.21**
LOGCOMP	0.68**	0.70**	0.68**	0.70**	0.68**	0.70**
LOGVA	0.09**	0.06**	0.10**	0.07**	0.09**	0.06**
STABILITY	0.31**	0.24**	0.31**	0.25**	0.29**	0.22**
LAW	-0.08**	-0.08**	-0.09**	-0.09**	-0.09**	-0.09**
Fixed effects	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*	*Industry*
N	15,008	13,919	14,436	13,344	15,007	13,914
Adj Rsquare	0.79	0.79	0.79	0.79	0.79	0.79

$$(1e)\ LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 C_i + \beta_3 TT_i * C_i + \beta_4 COLVAR_i + \beta_5 COLVAR_i * C_i + \beta_6 LogASSETS_i + \beta_7 LogCOMP_i + \beta_8 LogVA_i + \beta_9 STABILITY_i + \beta_{10} LAW_i + \varepsilon_i$$

This table reports OLS estimates of (1e). *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." *COLVAR* is *UNSTRICT* in the middle pair of columns and *CORRUPT* in the last pair of columns. *UNSTRICT*=1 if the parent country is judged to have unstrict transfer pricing practices by Mescall (2010); 0 otherwise. *CORRUPT* is the negative of the value calculated for the parent country by Kaufmann et al (2008) which measures "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests."

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.

Table 9 – The effect of foreign reinvestment opportunities

	Prediction	Baseline	Above the median	Top quintile	Bottom quintile
INTERCEPT		-0.95**	-0.97**	-0.96**	-0.87**
TT		-0.13**	-0.15**	-0.14**	-0.09**
C	-	-0.48**	-0.04	-0.19	-0.63**
*TT*C*	-	-0.85**	-1.23**	-1.02**	-0.64*
SPLITVAR			0.21**	0.20**	-0.11**
*TT*SPLITVAR*	0		0.05	0.06	-0.09**
*C*SPLITVAR*	-		-0.82**	-0.67*	0.44
*TT*C*SPLITVAR*	+		0.97**	0.69	-0.47
LOGASSETS		0.23**	0.23**	0.23**	0.23**
LOGCOMP		0.68**	0.67**	0.67**	0.67**
LOGVA		0.10**	0.09**	0.09**	0.10**
STABILITY		0.30**	0.30**	0.30**	0.29**
LAW		-0.08**	-0.07**	-0.07**	-0.08**
Fixed effects		*Industry*	*Industry*	*Industry*	*Industry*
N		14,610	14,609	14,613	14,611
Adj Rsquare		0.79	0.79	0.79	0.79
F-tests					
*C*SPLITVAR + TT*C*SPLITVAR <> 0*			0.52	0.07	0.07
			(0.47)	*(0.79)*	*(0.79)*
*TT*C + TT*C*SPLITVAR <> 0*			0.40	0.56	10.56**
			(0.53)	*(0.45)*	*(0.00)*

$$(1f)\ LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 C_i + \beta_3 TT_i * C_i + \beta_4 SPLITVAR_i + \beta_5 C_i * SPLITVAR_i + \beta_6 TT_i * C_i * SPLITVAR_{ii} + \beta_7 LogASSETS_i + \beta_8 LogCOMP_i + \beta_9 LogVA_i + \beta_{10} STABILITY_i + \beta_{11} LAW_i + \varepsilon_i$$

This table reports OLS estimates of (1f). *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." *SPLITVAR* assumes the value of the indicator variable which splits the sample at the point in the column heading, where observations have been sorted based on reinvestment opportunities.

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.
p-values for F-tests are in parentheses below the F-statistic.

Table 10 – The effect of domestic cash constraints

	Prediction	Baseline	Above the median	Top quintile	Bottom quintile
INTERCEPT		-1.00**	-1.03**	-1.03**	-1.03**
TT		-0.15**	-0.05	-0.10**	-0.19**
C	-	0.01	-0.36	-0.14	0.06
*TT*C*	-	-1.29**	-0.54	-1.03**	-1.50**
SPLITVAR			0.00	0.07	-0.02
*TT*SPLITVAR*	-		-0.20**	-0.26**	0.22**
*C*SPLITVAR*	+		0.67	0.69	-0.35
*TT*C*SPLITVAR*	-		-1.49**	-1.38*	1.12
LOGASSETS		0.25**	0.25**	0.25**	0.25**
LOGCOMP		0.66**	0.66**	0.66**	0.66**
LOGVA		0.11**	0.11**	0.11**	0.11**
STABILITY		0.31**	0.31**	0.31**	0.32**
LAW		-0.07**	-0.07**	-0.07**	-0.07**
Fixed effects		*Industry*	*Industry*	*Industry*	*Industry*
N		10,186	10,190	10,188	10,187
Adj Rsquare		0.80	0.80	0.80	0.80
F-tests					
*C*SPLITVAR + TT*C*SPLITVAR <> 0*			8.63	4.49	4.52
			(0.00)	*(0.03)*	*(0.03)*
*TT*C + TT*C*SPLITVAR <> 0*			31.44	19.36	0.37
			<.0001	*<.0001*	*(0.54)*

$$(1f)\ LogPLBT_i = \beta_0 + \beta_1 TT_i + \beta_2 C_i + \beta_3 TT_i * C_i + \beta_4 SPLITVAR_i + \beta_5 C_i * SPLITVAR_i + \beta_6 TT_i * C_i * SPLITVAR_{i_i}$$
$$+ \beta_7 LogASSETS_i + \beta_8 LogCOMP_i + \beta_9 LogVA_i + \beta_{10} STABILITY_i + \beta_{11} LAW_i + \varepsilon_i$$

This table reports OLS estimates of (1f). *LogPLBT* is the natural logarithm of profit before income tax expense (in thousands of dollars). TT is an indicator variable equal to 1 if the subsidiary is owned by a territorial parent; 0 otherwise. C is the family-level tax incentive measure developed by Huizinga and Laeven (2008). $LOGASSETS$ is the natural logarithm of tangible fixed assets reported by the subsidiary in 2006. $LOGCOMP$ is the natural logarithm of labor compensation paid by the subsidiary in 2006. $LOGVA$ is the natural logarithm of value added in 2006 in the subsidiary's country (in millions of U.S. dollars). *STABILITY* and *LAW* are indexes running from -2.5 to 2.5 from the Worldwide Governance Indicators (Kaufmann, et al., 2008). *STABILITY* is designed to capture "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism." *LAW* is designed to capture "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence." *SPLITVAR* assumes the value of the indicator variable which splits the sample at the point in the column heading, where observations have been sorted based on the domestic leverage of the parent.

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.
p-values for F-tests are in parentheses below the F-statistic.

Table 11 – Foreign cash holdings

	(1)	(2)	(3)	(4)
INTERCEPT	-0.33**	-0.15	-0.33**	-0.14
TT	-0.16**	-0.24**		
TT_5			-0.13**	-0.19**
TT_0			-0.17**	-0.28**
STATDIFF	1.38**	1.52**	1.38**	1.52**
*TT*STATDIFF*	-1.61**	-1.50**		
*TT_5*STATDIFF*			-1.73**	-1.81**
*TT_0*STATDIFF*			-1.71**	-1.54*
NI	0.62**	1.01**	0.62**	1.02**
LOGASSETS	-0.21**	-0.21**	-0.21**	-0.22**
STDEVNI	0.37**	0.68**	0.37**	0.69**
CAPEX	-1.82**	-2.32**	-1.81**	-2.31**
LEV	-0.02	-0.16**	-0.02	-0.16**
RD	-0.49**	-0.28*	-0.49**	-0.29*
DOM_RD		0.07		0.08
Industry fixed effects	*Y*	*Y*	*Y*	*Y*
N	15,603	9,021	15,600	9,021
Adj Rsquare	0.17	0.19	0.17	0.19
F-test	0.83	0		
TT*STATDIFF + STATDIFF <> 0	*(0.36)*	*(0.95)*		
F-test			0	0.16
TT_5*STATDIFF <> TT_0*STATDIFF			*(0.95)*	*(0.69)*
F-test			1.35	0.65
TT_5*STATDIFF + STATDIFF <> 0			*(0.25)*	*(0.42)*
F-test			0.47	0
TT_0*STATDIFF + STATDIFF <> 0			*(0.49)*	*(0.97)*

$$LogCASH_i = \beta_0 + \beta_1 TT_i + \beta_2 STATDIFF_i + \beta_3 TT_i * STATDIFF_i + \beta_4 LogNI_i + \beta_5 LogASSETS_i + \beta_6 StdevNI_i + \beta_7 CAPEX_i + \beta_7 LEV_i + \beta_8 RD_i + \beta_9 DOM\_RD_i + \varepsilon_i \quad (2)$$

This table reports OLS estimates of (2). $LogCASH$ the natural logarithm of (cash/total assets) reported on the unconsolidated financial statements of the subsidiary. $STATDIFF$ is the larger of the statutory tax rate of the parent minus the statutory tax rate of subsidiary and zero. TT is an indicator variable equal to 1 if the parent is domiciled in a territorial country; 0 otherwise. TT_5 is an indicator variable equal to 1 if the parent is domiciled in a territorial country that taxes 5% of foreign dividends; 0 otherwise. TT_0 is an indicator variable equal to 1 if the parent is domiciled in a territorial country that fully exempts foreign dividends; 0 otherwise. $LogNI$ is the natural logarithm of (net income/total assets) reported on the unconsolidated financial statements of the subsidiary. $LogASSETS$ is the natural logarithm of total assets. $StdevNI$ is the standard deviation of (net income/total assets) reported on the unconsolidated financial statements of the subsidiary in years 2001 – 2006. $CAPEX$ is (capital expenditures/total assets) reported on the unconsolidated financial statements of the subsidiary. LEV is ((current liabilities + long-term debt)/total assets) reported on the unconsolidated financial statements of the subsidiary. RD is (intangible fixed assets/total assets) reported on the unconsolidated financial statements of subsidiary *i*. DOM_RD is (intangible fixed assets/total assets) reported by the ultimate owner of subsidiary *i* in its home country.

Standard errors corrected for clustering at the parent level are not reported.
* and ** indicate statistical significance at the 5%, and 1% levels, respectively.
p-values for F-tests are in parentheses below the F-statistic.