The Valuation of Economic Earnings and Income Shifting of U.S. Multinationals in Domestic and Foreign Jurisdictions

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

I study U.S. multinationals' economic earnings and income shifting across their domestic and foreign jurisdictions. This study develops the concept of economic earnings, measures economic and shifted earnings, tests their market valuation, and tests differences in valuation across investor types. I conceptualize economic earnings by distinguishing between domestic and foreign earnings reported by firms and earnings created in these jurisdictions. I then measure domestic and foreign economic earnings by estimating country-specific (i) locations and (ii) economic earnings for U.S. multinationals. I estimate country-level economic earnings using a productivity function of domestic-only firms in each country. I test the validity of the economic earnings estimation procedure using a sample of domestic-only firms across 81 countries. The income shifting measure is the difference between reported and economic earnings. I theoretically and empirically compare the income shifting measures created in this study to existing measures and test their association with tax avoidance. For the valuation tests, I develop two earnings decomposition models that decompose total earnings into (a) domestic and foreign economic earnings and (b) shifted and resident components of earnings. I find that domestic and foreign economic earnings are value-relevant and valued relatively differently than domestic and foreign reported earnings. I fail to find evidence that income shifted into and out of the U.S. are value-relevant. I find that more sophisticated investors are associated with the valuation of income shifting and find, contrary to my predictions, that less sophisticated investors recognize underlying economic earnings components.

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1. Introduction

This study examines whether investors recognize that domestic and foreign earnings reported on U.S. multinational corporations' (MNCs') financial statements comprise income generated in the jurisdiction minus or plus income shifted to or from other jurisdictions. U.S. MNCs shift income into and out of the U.S. to benefit from differential tax rates and other tax incentives (Collins, Kemsley, & Lang, 1998; Klassen & Laplante, 2012a). The amount and direction of income shifted is not reported or disclosed, and income shifted is legitimately reported as belonging to the jurisdiction it is shifted. As a result of income shifting, the distribution of domestic and foreign income reported by U.S. MNCs is different from the economic results generated in domestic and foreign locations. Do investors impound information about these economic results and tax-motivated income shifting into prices? This study examines the research question by measuring these undisclosed earnings components and testing their value-relevance.

In this study, "reported earnings" refers to domestic and foreign earnings required by the Securities and Exchange Commission's Regulation 210.4-08(h) – General Notes to Financial Statements – Income Tax Expense. "Economic earnings" refers to earnings resulting from operations (see Bhattacharya, Daouk, & Welker, 2003; Teoh & Wong, 1993; Verrecchia, 1986). This study further specifies the location of economic earnings. Earnings produced domestically in the U.S. are "domestic economic earnings," and earnings produced in foreign non-U.S. jurisdictions are "foreign economic earnings." Finally, the term "income shifting" refers to income shifted between jurisdictions to benefit from tax incentives and lower tax rates (see Collins et al., 1998; Petroni & Shackelford, 1999).

Identifying whether investors recognize unreported economic earnings and income shifted is important for two reasons: (i) standard-setters focus on investors in their aim to improve firms' disclosures, and (ii) studies view investors' ability to recognize these components differently. The FASB has amended segment reporting and foreign income disclosures with a focus on providing information to investors (see Boatsman, Behn, & Patz, 1993; Thomas, 2000). In a project statement last updated October 27, 2021, the FASB is revisiting segment reporting requirements and inviting comments from investors (FASB, 2021). Second, while the tax accounting literature shows that investors recognize undisclosed tax liabilities and unreported foreign earnings components (Collins, Hand, & Shackelford, 2001; Oler, Shevlin, & Wilson, 2007; Laplante & Nesbitt, 2017), the financial accounting literature attributes the lower valuation of foreign earnings to investor inability (Callen, Hope, & Segal, 2005) and discusses improving disclosures (Boatsman et al., 1993; Thomas, 2000). Therefore, evidence that investors can recognize unreported earnings components is relevant to current standard-setting and reconciles views in the literature.

I examine investors' valuation of economic earnings and income shifting by measuring these earnings components and then testing the market's valuation of these components. First, I develop two earnings decomposition models, following the earnings model developed by Bodnar and Weintrop (1997). Bodnar and Weintrop decompose total earnings into domestic and foreign reported earnings, while I decompose total earnings into domestic and foreign economic earnings and further decompose jurisdiction-specific earnings into resident and shifted components. Next, I estimate domestic and foreign economic earnings of a U.S. MNC and calculate income shifting as the difference between reported and economic earnings. I hypothesize the value-relevance of each of the economic earnings and income shifting components and regress a firm's annual

cumulative abnormal returns on these components to test value-relevance. To reconcile mixed and untested assumptions about investor sophistication in the literature, I examine how the valuations of economic earnings and income shifting vary by investor sophistication.

Estimating economic earnings involves estimating U.S. MNCs' foreign locations and their economic earnings in these locations, neither of which is disclosed. To examine this study's research question, I am interested in economic earnings at the domestic and foreign levels because reporting requirements and taxation rules demarcate these jurisdictions. However, I estimate economic earnings by country. I expect that economic earnings vary by country and are a function of country-level characteristics affecting productivity. Using geographic segment disclosures, I first estimate specific countries in which a U.S. MNC operates. Next, using the financial information of domestic-only firms, I estimate a productivity function of firms in a given country and estimate economic earnings for a U.S. MNC's subsidiary in that country. Finally, I aggregate country-level economic earnings for all non-U.S. countries to calculate a firm's foreign economic earnings.

Since I introduce new economic earnings and income shifting measures, I examine the validity of these measures. I do not have existing measures of economic earnings with which to compare my economic earnings measures and therefore test the validity of my estimation procedure instead. I examine the validity of my economic earnings estimation procedure by applying it to a sample of domestic-only firms. Domestic-only firms operate in a single country and report their economic earnings. I treat a randomly selected sample of domestic-only firms as though they are subsidiaries of a U.S. MNC, having unknown economic earnings. I estimate a firm's economic earnings. Since this estimate is a proportion of earnings calculated from the product of earnings and regression coefficients, I test its correlation with the firm's reported

economic earnings. I find that my method's economic earnings estimates are highly correlated with reported economic earnings for the domestic-only samples.

Next, I test the validity of the income shifting measure in this study. I identify two existing measures (Klassen & Laplante, 2012a; Dyreng & Markle, 2016) and incorporate my measure in their models to provide (i) an association test and (ii) test whether the measures are substitutes or distinct. I additionally compare my measure to Collins et al. (1998) and Chen, Hepfer, Quinn, and Wilson (2018) as sensitivity checks. I generally find that my measure is associated with but distinct from existing measures of income shifting. I also test and find that this study's measure of income shifted from the domestic jurisdiction is associated with short-run tax avoidance.

I find that the economic earnings components are value-relevant, are valued relatively differently than the reported earnings components, and are recognized by less sophisticated investors. In support of my hypotheses, I find that the domestic and foreign economic earnings measured in this study are value-relevant. I also replicate valuation tests of reported earnings and find, consistent with prior studies (Bodnar & Weintrop, 1997; Christophe, 2002; Hope, Kang, Thomas, & Vasvari, 2008, 2009), that foreign reported earnings is valued significantly higher than the domestic component. In contrast, I find that domestic economic earnings is valued significantly higher than foreign economic earnings.

I additionally test whether the valuations of the various earnings components differ by investor sophistication, which I measure using (i) the number of institutional investors and (ii) analyst coverage. In support of the hypotheses, I find that each of the economic earnings components are valued significantly differently by more and less sophisticated investor groups. I also find that more sophisticated investors value each of the reported earnings components

significantly differently than less sophisticated investors. Specifically, less sophisticated investors value reported and economic earnings, but more sophisticated investors do not. Therefore, I find that investors recognize domestic and foreign economic earnings, value domestic economic earnings higher, and can estimate these amounts if they are less sophisticated.

I find that the valuation of income shifting components is dependent on investor sophistication and investor sophistication proxy. I do not find evidence that the income shifting components are value-relevant, on average. I also do not find evidence that less sophisticated investors recognize income shifting components. However, I find that more sophisticated investors value income shifting and that the direction of shifting valued depends on the sophistication proxy. The high institutional ownership group values income shifted from the foreign jurisdiction, while the high analyst coverage group recognizes income shifted from the domestic jurisdiction.

In addition to these results, I hypothesize significant differences in valuation of the income shifting components between more and less sophisticated investors and find that valuation differences depend on the investor sophistication proxy. I find that high and low institutional ownership groups value the shifting components, domestic and foreign, significantly differently. On the other hand, high and low analyst coverage groups value the domestic components, resident and shifted, significantly differently. Overall, these findings are consistent with institutions having the resources to disentangle foreign information and analysts having an information advantage from focusing on domestic information (Van Nieuwerburgh & Veldkamp, 2009). Therefore, I find that sophisticated investors value income shifting, and that the direction of shifting valued depends on the sophistication proxy.

This study contributes to our understanding of investors' valuation of unreported earnings components, more generally (e.g., Amir & Lev, 1996; Barth, 1991; Sougiannis, 1994). More specifically, this study contributes to the financial and tax accounting literature on foreign earnings valuation. Contributions beyond the scope of this study include a country-level measure of economic earnings and cleaner classifications of segment data. This study provides a distinct measure of income shifting and initial evidence on the valuation of income shifting. I also replicate prior studies' tests.

This study makes three theoretical contributions. First, I conceptualize economic earnings, which more accurately represents the concept of jurisdiction-specific earnings presented in the literature. Financial accounting studies motivate their valuation tests of reported earnings by arguing different economic properties of domestic and foreign jurisdictions (e.g., Boatsman et al., 1993; Bodnar & Weintrop, 1997). I incorporate tax knowledge of income shifting to highlight the distinction between reported earnings and economic earnings. Second, the financial accounting literature is motivated by mixed evidence on the relative valuation of domestic and foreign earnings (e.g., Christophe, 2002; Callen et al., 2005). I clarify mixed evidence in the literature by classifying studies based on the research question and financial statement source of foreign earnings examined. Third, I identify a discrepancy in assumptions about investor sophistication between the financial and tax accounting literature. Studies in the financial accounting literature are motivated by improving disclosure to investors (e.g., Boatsman et al., 1993; Thomas, 2000), while the tax accounting literature shows that investors recognize complex unreported foreign tax values (e.g., Collins et al., 2001; Oler et al., 2007). The two sets of literature have different assumptions about investor sophistication; however, they

do not test how the valuation of earnings components varies with investor sophistication.[1] The theoretical contributions of this study include the concept of economic earnings, clarifying mixed evidence on the relative valuation of domestic and foreign earnings, and highlighting a discrepancy in assumptions about investor sophistication in the literature.

A methodological contribution of this study is the measurement of economic earnings. The literature has relied on reported earnings to capture the economics of domestic and foreign jurisdictions (e.g., Bodnar & Weintrop, 1997; Christophe, 2002). In addition to measuring domestic and foreign economic earnings relevant to this study, I measure economic earnings by country. I also measure economic earnings using publicly available financial statement data and construct replicable codes. Therefore, this study produces a more accurate measure of jurisdiction-specific earnings conceptualized in prior work, which can be useful to future work on country-specific earnings.

In the process of measuring economic earnings, I develop more accurate classifications of segment data. I find errors in Compustat's classifications of (i) geographic, operating, and business segments and (ii) domestic and foreign geographic segments. I create an algorithm to identify geographic segments and classify types of geographic segments from all segment names reported in Compustat. Within geographic segments, I also develop a cleaner classification of domestic and foreign segments by matching a variety of geographic segment names used by MNCs with specific countries. These algorithms are useful for studies that may be interested in cleaner segment data.

This study allows me to construct a distinct measure of income shifting than exists in the literature. The income shifting measure in this study captures net transfers of inbound or

[1] Two exceptions are Callen et al. (2005), who test the variance components of earnings, and Campbell, Dhaliwal, Krull, & Schwab (2014), who test the valuation of foreign cash.

outbound shifting as a proportion of total earnings in a given firm-year. In Chapter Five, I compare my measure to various existing income shifting measures: Hines and Rice (1994), Collins et al. (1998), Klassen and Laplante (2012a), Chen et al. (2018), and Dyreng and Markle (2016). Additionally, prior studies do not test the valuation of income shifting. On average, I do not find evidence that income shifting is value-relevant. However, I find that sophisticated investors value income shifting. Therefore, this study contributes a new measure of income shifting to the literature and provides evidence on the valuation of income shifting.

An additional contribution of this study is replicating prior tests. Specifically, I replicate Bodnar and Weintrop's (1997) foreign earnings valuation test and Klassen and Laplante's (2012a) income shifting estimation. I run these regressions for each incremental deviation I make from the original studies' design and sample choices. I find that their results hold for my sample. I also replicate the income shifting estimations by Collins et al. (1998), Chen et al. (2018), and Dyreng and Markle (2016) for my sample. Therefore, this study demonstrates the external validity of prior work.

This study produces data and results that have implications for government and tax policy. The country-specific economic earnings, asset, and employee estimates of U.S. subsidiaries provide data to inform tax-specific policy and economic policy. Additionally, the distinction between economic earnings and earnings reported in financial statements and to tax authorities may help governments and tax authorities focus on the underlying components. The result that foreign economic earnings are less value-relevant than U.S. economic earnings suggest policy changes for countries interested in increasing the value-relevance of their jurisdiction's earnings. Moreover, the result that foreign reported earnings are valued relatively

higher than domestic reported earnings also inform tax policy. I first discuss the usefulness of estimates created in this study, followed by how the valuation results might inform policy.

The country-specific estimates of economic earnings produced in this study provide data for policymakers to compare earnings produced in their jurisdictions to earnings that are reported and subsequently taxed. The country-specific asset and employee estimates of U.S. MNC subsidiaries produced in this study provide data to inform policy (see Appendix B). For instance, governments might want to increase the presence of multinationals to positively affect the employment rate or the country's intellectual capital. Estimates of the number of employees of U.S. MNC subsidiaries, in addition to the values for domestic-only firms for comparison, provide data to assess such policy. Comparing employee estimates to asset estimates of U.S. MNC subsidiaries also provides useful information. If the presence of U.S. subsidiaries is predominantly asset-related, governments might consider changing the mix of incentives they offer. Another example of the usefulness of the data is that the country-specific estimates of economic earnings, labor, and capital of U.S. MNC subsidiaries relative to domestic-only firms also indicate the presence of U.S. MNCs in a country. A comparison of the presence of U.S. MNCs relative to domestic-only firms can inform policy targeted at attracting and retaining MNCs. Therefore, the country-specific estimates created in this study can help governments assess tax revenues and design policies to improve productivity or the presence of U.S. MNCs.

The result that investors of U.S. MNCs value foreign economic earnings relatively lower than domestic economic earnings suggests policy changes to improve economic conditions. The value-relevance of foreign jurisdiction earnings may be affected by (i) regulatory costs and barriers to entry, (ii) different business cycles and legislation, and (iii) information asymmetry associated with the distance and differences of foreign jurisdictions (Bodnar & Weintrop, 1997;

Callen et al., 2005; Christophe, 2002). I describe policy that may improve foreign economics and, subsequently, the value-relevance of these earnings below.

First, economic earnings in a particular country may be less value-relevant because of risks and barriers to entry. Governments may foster a more welcoming environment for international firms by reducing regulatory costs. Policy might target improving information, processes, and accessibility surrounding legal practices. Governments might also design incentives for multinationals to maintain and set up operations. An example of a fiscal incentive is R&D tax incentives popularly used by countries to build intellectual capital. Governments might choose to differentiate between industry sectors or types of activities to promote their country's specific agenda.

Second, countries concerned about the value of U.S. MNCs' economic earnings might try to match their business cycles to those followed in the U.S. For instance, some countries in North Africa, the Middle East, and Southeast Asia have different weekend days than the U.S. To accommodate international firms, the United Arab Emirates' government enacted policy to change the workdays of some sectors to match those followed in the rest of the world. Governments could also participate in changing working hours affected by different time zones. Governments may (i) choose not to enact policy (e.g., offshore call-centers in India), (ii) work with firms to create flexible hours (e.g., the U.K.), or (iii) enforce stringent laws to enhance the quality of living (e.g., France and Germany).

Finally, policy can also affect information asymmetry associated with foreign jurisdictions to enhance the value of earnings in their country to investors. Policymakers can improve (i) information provided by subsidiaries and (ii) information about the country. Policy to improve information and public reporting by U.S. subsidiaries may include language mandates.

In addition to the official language, subsidiaries of U.S. MNCs may also be required to translate local reports to English. Governments can also improve the value of earnings created in their jurisdictions by enhancing the transparency of their political and economic environments to the outside world. Transparency improvements might include news reporting. Some governments exercise media censorship, or the news is reported exclusively in the official language. Governments looking to improve the economic value of earnings created in their jurisdictions might want to take measures to improve information about their country's domestic environments.

The distinction between economic and reported earnings highlighted in this study also indicates policy implications for the reported components. Earnings reported in foreign jurisdictions are valued relatively higher than earnings reported in the U.S. This result specifically indicates that taxation policies in foreign countries enhance the value of earnings reported in their jurisdictions and that policy changes may not be required. However, following the U.S. statutory corporate tax rate decrease, I expect the relative valuation of reported earnings and the implication for foreign countries' tax policy to change post-2018.

In conclusion, this study provides country-specific firm-year estimates of economic earnings, assets, and employees for U.S. subsidiaries. The data can help governments estimate earnings produced in their jurisdictions and labor and capital investments by U.S. MNCs. The result that investors value foreign economic earnings less than domestic economic earnings might also affect government policy. Governments might want to improve their country's economic environment to enhance the value of earnings created in their jurisdictions by U.S. MNCs.

Chapter 2 reviews the literature on the valuation of foreign and domestic earnings from two streams in the accounting literature: financial accounting and tax accounting. Chapter 3 presents the theoretical model for the decomposition of earnings components used in this study and develops and presents this study's hypotheses. The research design, Chapter 4, describes the empirical model, measurement of constructs, samples, data sources, and design choices. Chapter 5 presents validity checks of the two new constructs introduced in this study: economic earnings and income shifted measures. The set of hypotheses H1 deals with the valuation of economic earnings and shifted earnings components developed in the study. The set of hypotheses H2 predicts valuation differences between more and less sophisticated market users. I discuss the results of testing this study's hypotheses in Chapter 6 and finally. Chapter 7 concludes and presents key findings, limitations of the study, and avenues for future research.

2. Literature Review

2.1 Introduction

In this chapter, I review the literature that examines the valuation of foreign earnings. Two distinct sets of literature examine the valuation of foreign earnings components: (i) the financial accounting literature, which examines the value relevance of foreign and domestic earnings (e.g., Bodnar & Weintrop, 1997, Christophe, 2002), the usefulness of geographic segment disclosures (e.g., Boatsman et al., 1993; Thomas, 2000), and the valuation of global diversification (e.g., Bodnar et al., 1997; Denis et al., 2002); and (ii) the tax accounting literature which examines the valuation of the deferred tax liability associated with foreign earnings and foreign cash (e.g., Bryant-Kutcher, Eiler, & Guenther, 2008; Campbell et al., 2014; Collins et al., 2001; Oler et al., 2007). In reviewing the literature, I highlight two sets of discrepancies that indicate the importance of this study's research questions: (i) within the financial accounting literature, that provides mixed evidence on the relative valuation of foreign and domestic earnings components; and (ii) between the financial accounting and tax accounting literature, that shows different levels of investor sophistication in valuing foreign components.

I first review the financial accounting literature and present background on the different sources of foreign earnings components, a timeline of literature, and reasons for differences in foreign and domestic earnings argued and examined in the literature. Second, I review the tax accounting literature examining the valuation of foreign tax components and include details on the tax treatment of the components examined. Third, I compare the financial and tax accounting literature and finally conclude by highlighting evidence in the literature that justifies the research question in this study.

2.2 Review of the Financial Accounting Literature Examining the Valuation of Foreign Earnings

In this section, I review the literature on the valuation of foreign earnings relative to U.S. domestic earnings.[2] Although viewed collectively as the literature on foreign earnings valuation (see Callen et al., 2005; Christophe 2002), I observe that the financial accounting literature on the valuation of foreign earnings components examines three distinct questions: (i) the value relevance and relative valuation of foreign and domestic earnings components (e.g., Bodnar & Weintrop, 1997), (ii) the usefulness of segment disclosures (e.g., Boatsman et al., 1993), and (iii) the valuation of geographic diversification (e.g., Denis et al., 2002).

Depending on the question examined, these studies rely on different financial statement disclosures as the source of foreign. The first question examines the valuation of foreign earnings disclosed under SEC Regulation 210.4-08(h) – General Notes to Financial Statements – Income Tax Expense (hereafter referred to as Rule 4-08(h)), while the second and third questions are concerned with income and fundamentals reported in geographic segment disclosures under SFAS No. 14 - Financial Reporting for Segments of a Business Enterprise (succeeded by SFAS No. 131 - Disclosures about Segments of an Enterprise and Related Information, and later by ASC 280 – Segment Reporting). Although the sources of information varied in these studies, a primary motivation for these studies was discussions surrounding the adequacy of disclosure requirements and subsequent changes in disclosure (see Boatsman et al., 1993; Bodnar & Weintrop, 1997; Thomas, 2000).

First, I present a timeline of the literature on the valuation of foreign earnings. The timeline begins with the pioneer studies in the area, that is Boatsman et al. (1993), examining the

[2] This review does not include international studies on the valuation of foreign earnings for countries following International Accounting Standards (e.g., Bodnar, Hwang, & Weintrop, 2003; Garrod & Rees, 1998)

value relevance of geographic segment disclosures, and Bodnar and Weintrop (1997), examining the value relevance of domestic and foreign earnings disclosed under Rule 4-08(h). Chronologically, these studies are followed by studies on the valuation of geographic diversification, studies re-examining the value relevance of segment disclosures under SFAS 14 in anticipation of SFAS 131, further developments in the examination of earnings disclosed under Rule 4-08(h), and finally, studies testing the usefulness of segment disclosures under SFAS 131.

Following my summary of studies on foreign earnings valuation presented as a timeline, I summarize arguments in the literature regarding differences in valuation between domestic and foreign earnings components. I first discuss the theoretical arguments presented in the literature, followed by a summary of explanations tested by these studies.

2.2.1 Timeline of the Literature on Foreign Earnings Valuation

The foreign earnings valuation literature began with Boatsman et al.'s (1993) valuation tests of segment-level income reported under SFAS No. 14. The usefulness of geographic segment disclosures was controversial at the time, from criticism about lenient requirements resulting in inaccurate information (AIMR, 1993; AICPA, 1994), to anecdotal evidence about managers using these disclosures to avert questions about international transfer pricing (see Balakrishnan, Harris, & Sen, 1990; Boatsman et al., 1993). The disclosure requirement even had significant market implications, with foreign companies choosing to delist from U.S. stock exchanges than to disclose geographic segment information (see Balakrishnan et al., 1990). Boatsman et al. test the value-relevance of operating profit disclosed for the U.S. and five major geographic regions using a short-run event study and a long-run association test. For their sample period, 1985-1989, they find that foreign profits for Asia, Europe, and Canada are value-relevant

and valued less than domestic profits, while foreign profits for Great Britain are value-relevant and valued more than domestic profits. However, these results are not consistent after excluding large values of unexpected segment profits or yearly cross-sectional tests. In their long-run association test, they find that segment operating profits are value-relevant for Europe, Great Britain, and Canada and that each of these segments is valued more than the domestic segment.[3] Boatsman et al. state that they find limited evidence on the association between unexpected segment earnings and unexpected returns and that the valuation of segments is highly sensitive to the period examined, regions included, and size of segment profits.

Following Boatsman et al.'s (1993) study on the valuation of foreign earnings in segment disclosures, Bodnar and Weintrop (1997) pioneered the literature on the valuation of foreign and domestic components disclosed in the Notes to the Financial Statements under Rule 4-08(h). Motivated by SEC and FASB discussions on the expansion of disclosure and limited evidence on the value relevance of foreign financial information, Bodnar and Weintrop examine (i) whether investors incorporate foreign earnings information in their valuation process and (ii) how investors perceive foreign earnings relative to domestic earnings. They motivate this second question by presenting the possibility that foreign earnings could be valued either lower or higher than domestic earnings based on their different characteristics.[4] For their sample period beginning 1985 to 1993, they find that foreign earnings are valued higher than domestic earnings and that foreign growth opportunities drive the differential valuation.[5]

[3] Segment operating profits for Asia and South America were not significantly associated with returns and had smaller coefficients than the coefficient for the U.S. segment.
[4] I expand on these reasons in the following section.
[5] Foreign and domestic growth opportunities are measured using foreign and domestic sales data in segment disclosures.

2.2.1.1 Literature on the Valuation Oof Geographic Diversification. Similarly motivated by the different characteristics of foreign and domestic earnings, studies concurrently examined the benefits of geographic diversification (e.g., Brewer, 1981; Fatemi, 1984; Mikhail & Shawky, 1979) and produced mixed results, both in favor of and against geographic diversification. To reconcile mixed results, Bodnar, Tang, and Weintrop (1997) and Denis et al. (2002) test the valuation of geographic diversification conditional on industrial diversification. These studies test how geographic diversification affects valuation by comparing non-diversified domestic firms to diversified U.S. MNCs. While Bodnar et al. (1997) find that geographic diversification is valued positively, Denis et al. (2002) find that the market discounts geographic diversification.

Bodnar et al. (1997) and Denis et al. (2002) are related to the foreign earnings valuation literature as they measure the incidence of geographic diversification and foreign sales of U.S. MNCs using SFAS 14 geographic segment disclosures. Although these studies do not test the valuation of foreign and domestic earnings, as in Bodnar and Weintrop (1997), or segment profits, as in Boatsman et al. (1993), they provide evidence about the market valuation of foreign activity reported in geographic segment disclosures. Denis et al. (2002) is cited by later studies examining the valuation of foreign earnings disclosed under Rule 4-08(h) (Callen et al., 2005; Christophe, 2002) as providing evidence that foreign earnings are less value-relevant than domestic earnings.

2.2.1.2 Literature Re-Examining Value Relevance of SFAS 14 Geographic Segment Disclosures in Anticipation of SFAS 131. Thomas (2000) and Christophe and Pfeiffer (2002) re-examine the value relevance of geographic segment earnings disclosed under SFAS 14 as SFAS 131 would affect precision in defining a geographic segment and potentially reduce

disclosure of geographic segment earnings (see Herrmann & Thomas, 2000).[6] First, while geographic segments were defined by region under SFAS 14, SFAS 131 requires disclosure of countries where material; however, the materiality threshold is not specified (see FASB 1997). These lenient requirements resulted in firms reporting fewer segments but instead aggregating immaterial segments as "Other Foreign" (see Herrmann & Thomas, 2000). Second, although SFAS 14 required firms to disclose assets, sales, and earnings by geographic segment, under SFAS 131, firms are only required to disclose geographic segment earnings if operating segments are defined by geographic location. However, if operating segments are defined on a different basis (e.g., industry lines or product type), geographic segment information may only include revenues by customer location and long-lived assets (see FASB 1997). Thomas (2000) and Christophe and Pfeiffer (2002) examine the sample period just before SFAS 131 was implemented (for fiscal years starting after December 15, 1997), with Thomas' sample spanning 1984-1995 and Christophe and Pfeiffer's spanning 1990-1994.

Thomas (2000) specifically motivates his study to re-examine evidence by Boatsman et al. (1993) that earnings from different geographic segments are valued similarly, and the subsequent implication that segment disclosures may not be more useful than consolidated earnings information. Contrary to Boatsman et al., Thomas finds significant earnings valuation differences between geographic segments by adjusting Boatsman et al.'s model and measurement. Specifically, Thomas uses an association study with annual returns rather than Boatsman et al.'s event study. As a result, Thomas forgoes the exchange rate adjustment made by Boatsman et al. and assumes a zero expected change in exchange rates because exchange

[6] According to Herrmann and Thomas (2000), most companies defined operating segments by industries rather than geographic location. They find that for firms that report geographic segments, only 16% report earnings by geographic segment.

rates follow a random walk over the year (Frankel & Rose, 1995). Lastly, Thomas supplements his analysis with a model using leading period returns suggested by Kothari and Sloan (1992). Regarding the relative valuation of foreign and domestic segment earnings, similar to Boatsman et al., Thomas finds that some foreign segments are valued higher while others are valued lower than the domestic segment in his leading period model. However, in the current period model, his results show domestic segment earnings are valued the least. Although his results are similar to Boatsman et al. in showing mixed results for the relative valuation of domestic and foreign segments, Thomas concludes that SFAS 131 would do away with value-relevant information provided by the level of disaggregation provided by SFAS 14.

On the other hand, Christophe and Pfeiffer (2002) provide evidence that disaggregated geographic segment disclosures are not useful to investors. Their approach to demonstrating the usefulness of SFAS 14' more disaggregated disclosure compares the valuation of disaggregated segment information to the aggregation of the same information. Using a Tobin's q model and a returns model, they measure aggregated foreign segment information by restricting the coefficients on different foreign segments to be equal, while coefficients for disaggregated segments are not restricted. Similar to Boatsman et al. (1993) and Thomas (2000), they find mixed evidence regarding the relative valuation of the domestic segment to distinct foreign segments. However, they find that aggregate foreign sales are valued less than domestic sales and conclude that investors value foreign operations less than domestic operations, consistent with evidence by Christophe (2002), which uses foreign earnings disclosed under Rule 4-08(h).

2.2.1.3 Developments in the Literature on Domestic and Foreign Earnings Disclosed Under Rule 4-08(h). At this point in the literature, it appeared as though the foreign earnings valuation literature was strewn with mixed results about the valuation of foreign earnings

components. Christophe (2002) is motivated by Boatsman et al. (1993), Christophe and Pfeiffer (2002), and Denis et al. (2002) 's result that domestic operations are valued more than foreign operations and Bodnar and Weintrop's (1997) opposite result. Christophe extends Bodnar and Weintrop's study by partitioning the domestic and foreign components of earnings into positive and negative changes. He observes that foreign earnings' greater value relevance is driven by negative changes in foreign earnings rather than positive changes. He also finds that the market asymmetrically discounts negative changes in foreign earnings more than negative changes in domestic earnings but values positive changes in foreign and domestic earnings similarly. He concludes that evidence of the market's larger reaction to negative foreign earnings changes is consistent with the literature showing the lower valuation of foreign operations.

Callen et al. (2005) are also motivated by mixed results in the literature, citing Bodnar and Weintrop (1997) and Bodnar et al. (1997) as showing that foreign earnings are valued more highly than domestic earnings and citing Denis et al. (2002) and Christophe and Pfeiffer (2002) as showing that domestic earnings are valued more. They further examine the domestic and foreign earnings valuation question posed by Bodnar and Weintrop by measuring the variance contribution of these components. Since foreign and domestic earnings have different variances and the literature acknowledges that the greater persistence of foreign earnings can manifest as a higher valuation coefficient on foreign earnings (see Boatsman et al. 1993; Callen et al., 2005; Thomas, 1999), Callen et al. examine the variance contributions of domestic and foreign earnings to firm valuation. According to Callen et al., variance effects complement mean effects and are not captured by models that measure mean earnings response coefficients. They find that domestic earnings contribute to the variance of returns more than foreign earnings; however, this

result is specific to the relative variance valuation of these components and is distinct from studies documenting higher mean valuation of domestic earnings.

Hope and Kang (2005) also further examine the valuation of foreign earnings disclosed under Rule 4-08(h) by proposing that the original model omits correlated variables. They conjecture that returns and earnings are correlated with "other information," specifically analyst information and discount rate changes captured by Liu and Thomas' (2000) model. Presenting information in analyst forecast revisions and discount rate changes as an alternate explanation to the differential valuation of foreign and domestic earnings, Hope and Kang control for "other information" and find that foreign and domestic earnings are valued similarly. They conclude that other information is an omitted variable in the analysis of foreign and domestic earnings.

2.2.1.4 Literature Examining the Usefulness of Geographic Segment Disclosures Post-SFAS 131.

The latest studies in the broad literature on foreign earnings valuation examine the usefulness of SFAS No. 131 geographic segment disclosures. Using the passage of SFAS 131 as a natural experiment, Hope et al. (2008) find that information in segment disclosures is more value-relevant post-SFAS 131 than in the pre-SFAS 131 period. They additionally find that these disclosures mitigate mispricing documented by Thomas (1999). Similarly, Hope et al. (2009) employ a difference in differences design to examine the valuation effects of specific disclosure attributes, such as the number of segments disclosed and disclosure of geographic segment earnings.[7] Although these studies are concerned with the valuation effects of geographic segment disclosures, their valuation tests include domestic and foreign earnings reported under Rule 4-08(h) as control variables. Hope et al. (2008, 2009) show that foreign earnings are valued higher than domestic earnings for sample periods spanning 1985-2004 (Hope et al. 2008) and 1998-

[7] Under SFAS 131, disclosure of segment level earnings is only required if operating segments are defined by geographic location.

2004 (Hope et al. 2009), including more recent years than the 1985-1993 period examined by Bodnar and Weintrop (1997).

2.2.1.5 Conclusion. Based on the discussion above, the different sets of results can be categorized by the three different research questions and associated source of foreign information. First, studies that examine the valuation of domestic and foreign earnings reported in the Notes to the Financial Statements under Rule 4-08(h) consistently show that foreign earnings from this source are valued higher than domestic earnings reported alongside (e.g., Bodnar & Weintrop, 1997; Christophe, 2002; Hope et al. 2008; Hope et al. 2009). However, studies have conducted different analyses, such as partitioning earnings by positive and negative changes (Christophe, 2002), measuring variance contributions (Callen et al., 2005), and controlling for information in analyst forecast revisions and discount rates (Hope & Kang, 2005) that indicate foreign earnings are valued less than domestic earnings. Second, studies that examine the valuation of foreign information in geographic segment disclosures, under either SFAS 14 or SFAS 131 (e.g., Boatsman et al., 1993; Christophe & Pfeiffer, 2002; Thomas, 2000), produce mixed evidence on both the relative valuation of foreign and domestic components and the usefulness of the disclosure examined. Third, studies examining the valuation impacts of firms' geographic diversification (e.g., Bodnar et al., 1993; Denis et al., 2002), measured using geographic segment disclosures, also provide mixed evidence on whether geographic diversification increases or decreases firm value.

Therefore, classifying studies by research question and financial statement source of foreign earnings information indicates that although the valuation of foreign earnings is higher than domestic earnings reported under Rule 4-08(h), examining underlying properties of these earnings reveals exceptions (e.g., Callen et al., 2005; Christophe, 2002; Hope & Kang, 2005).

Additionally, although lumped together in the literature, my review demonstrates that studies showing mixed results on the usefulness of geographic segment disclosures and the benefits of geographic diversification are distinct from the question regarding the value relevance of Rule 4-08(h) earnings.

2.2.2 Differences in the Relative Valuation of Foreign and Domestic Earnings

In this section, I summarize arguments presented in the literature, first, that support the lower valuation of foreign earnings relative to domestic earnings, and second, that support the higher valuation of foreign earnings relative to domestic earnings. Following this discussion of theoretical arguments presented in the literature, I review explanations for valuation differences tested in the literature.

2.2.2.1 Arguments for the Lower Valuation of Foreign Earnings Relative to Domestic Earnings.

Although Boatsman et al. (1993) present risk and persistence as the major reasons for differences in valuation of domestic and foreign earnings, I collectively present reasons for the lower valuation of foreign earnings relative to domestic earnings presented in the literature and classify them as (i) inevitable differences between a domestic and foreign environment and (ii) consequences of geographically distant operations.

First, as a natural consequence of dealing with a foreign environment, different exchange rates, business cycles, legislation, politics, economic growth, and financial reporting affect the valuation of foreign earnings relative to domestic earnings (see Bodnar & Weintrop, 1997; Christophe & Pfeiffer, 2002). These inevitable differences adversely affect the valuation of foreign earnings if they are risky or investors perceive risk due to fluctuating exchange rates, competition, or uncertain political and economic environments (see Bodnar & Weintrop; Christophe & Pfeiffer). Differences in legal environments also increase risks and barriers to entry

and impose restrictions on operations (see Callen et al., 2005; Christophe 2002). Bodnar and Weintrop also state that financial reporting differences between the U.S. and other countries decrease the value relevance of foreign earnings because the temporal method of foreign currency consolidation under U.S. GAAP produces foreign earnings values that are less reliable than domestic values (see Bartov & Bodnar, 1996). Therefore, features of a foreign environment that pose uncertainty, risk, or reduce reliability decrease the value relevance of foreign earnings.

Another set of arguments for the lower valuation of foreign earnings stems from the geographic distance of foreign operations. Geographic distance increases information asymmetry between investors and management in the domestic jurisdiction and foreign operations and management. This creates an adverse selection problem for investors and, both, adverse selection and moral hazard problems for management. First, investors may value foreign earnings less than domestic earnings because of information asymmetry arising from distance (Bodnar & Weintrop, 1997; Bodnar et al., 1997; Callen et al., 2005; Denis et al., 2002; Hope et al., 2008, 2009) and the complexity of foreign markets and information (Callen et al., 2005; Hope et al., 2008, 2009). Second, managers' distance from foreign operations may result in difficulty managing foreign operations (Bodnar et al., 1997; Christophe, 2002; Denis et al., 2002), continued investment in unprofitable operations due to a sunk cost fallacy (Christophe, 2002), or inefficient management of less profitable business segments (Denis et al., 2002). Third, physical distance exacerbates moral hazard problems associated with managers. Difficulty monitoring managers due to distance and the complexity of multinational operations, as well as manager self-interest in increasing risk and empire-building, can destroy firm value and subsequently decrease the value of foreign operations (Bodnar et al., 1997; Denis et al., 2002). Therefore, the

geographic distance of foreign operations results in information asymmetry that can decrease the value and valuation of foreign operations.

2.2.2.2 Arguments for the Higher Valuation of Foreign Earnings Relative to Domestic Earnings. Similarly, I collectively present reasons for the higher valuation of foreign earnings relative to domestic earnings presented in the literature and classify them into two categories: (i) exchange rate differences and (ii) opportunities to increase growth and expansion.

First, Bodnar and Weintrop (1997) argue that foreign earnings may be valued higher than domestic earnings in instances when the U.S. dollar falls below the foreign currency, resulting in a "pure price effect" since exchange rate differences are unforecastable and permanent (Frankel & Rose, 1995). Bartov and Bodnar (1994) also document mispricing of foreign earnings due to exchange rate differences. However, Christophe (2002) and Christophe and Pfeiffer (2002) explain that exchange rate effects on foreign earnings valuation stabilized in the 1990s.

In the second category of arguments, one economic reason why foreign earnings may be valued more than domestic earnings is growth opportunities afforded by new foreign markets and expectations of higher future earnings (see Bodnar & Weintrop, 1997; Christophe 2002). Additionally, foreign operations may be valued more than domestic operations as they provide operational flexibility and the opportunity to extract above-market gains by spreading out firm-specific assets to overcome market imperfections (see Bodnar et al., 1997; Denis et al., 2002). Foreign operations also provide an opportunity to gain from the arbitrage of institutional restrictions (see Bodnar et al., 1997). Finally, the geographic diversification literature highlights that firms' investment in foreign operations adds value to investors and subsequently increases the value of foreign operations since firms can diversify geographically at a lower cost than investors can (see Bodnar et al., 1997; Denis et al., 2002). Therefore, foreign earnings may be

valued more than domestic earnings because of exchange rate differences and opportunities to grow and expand.

2.2.2.3 Explanations for the Difference in Relative Valuation of Foreign and Domestic Earnings Tested in the Literature. Studies examining the relative valuation of foreign and domestic earnings generally find that the foreign component is valued higher than the domestic component (e.g., Bodnar & Weintrop, 1997; Christophe, 2002; Hope et al. 2008; Hope et al. 2009) and conduct additional tests to identify the cause of this differential valuation. Among numerous explanations tested, only foreign growth opportunities (Bodnar & Weintrop, 1997; Christophe, 2002) and agency problems (Christophe, 2002) contribute to the higher valuation of foreign earnings.

Bodnar and Weintrop (1997) test alternative explanations, cross-sections, and economic explanations for the higher valuation of foreign earnings but only find evidence that foreign growth opportunities affect the higher valuation of foreign earnings. They examine two alternative explanations: timing delays in receiving foreign information and adjustments to their earnings model for negative earnings (see Hayn 1995) and corporate restructuring during their sample period. They also perform tests across the different years in their sample to rule out the influence of outlying observations or cross-sectional correlation between the residuals. They additionally examine two economic explanations: (i) exchange rate effects and (ii) growth opportunities. Using an exchange trade index to weight currencies, they measure foreign currency volatility to rule out the effect of exchange rates on the higher valuation of foreign earnings. Their test examining the effect of foreign growth opportunities, measured using foreign segment sales, finds that foreign growth opportunities affect the higher valuation of foreign earnings relative to domestic earnings. However, the foreign earnings component is still valued

higher than domestic earnings, and they conclude that unmeasured growth opportunities or other factors might further affect the differential valuation of these components.

Christophe (2002) examines agency problems and growth opportunities as possible explanations for the differential valuation of foreign and domestic earnings. He tests whether management's incentive to increase risky investments, proxied by the level of free cash flow, affects the valuation of positive and negative foreign earnings changes. He finds that the market heavily discounts negative foreign earnings changes for firms with the highest quartile of free cash flows and interprets this as evidence that agency problems affect the differential valuation of foreign earnings. He also tests whether foreign growth opportunities, measured by prior year Tobin's q (see Chung & Pruitt, 1994), affect valuation differences. He finds that the market significantly discounts negative foreign earnings where they anticipated growth opportunities. Therefore, both agency problems and misleading growth signals lead to a larger discount on negative foreign earnings changes.

Callen et al. (2005) examine explanations for differences in the persistence of domestic and foreign earnings. They test whether firm size, differences in domestic and foreign growth, the signs of changes or levels of earnings, the proportion of foreign earnings, income taxes, or exchange rates affect the differential variance contributions but do not find supporting evidence.

The literature inadvertently rules out additional explanations for the relatively higher valuation of foreign earnings while testing explanations for related hypotheses. In their baseline models, Hope and Kang's (2005) tabulated results show that differences in domestic and foreign growth opportunities, measured using segment sales, and positive and negative earnings changes do not affect the higher relative valuation of foreign earnings. They also examine but do not find evidence that income tax expenses, size, foreign exchange rates, timeliness of good and bad

news affect the differential valuation of foreign and domestic components. Similarly, although Hope et al. (2008, 2009) test explanations for valuation differences arising from SFAS 131 implementation, their models include domestic and foreign earnings variables, for which they report similar results in additional tests. Specifically, Hope et al.'s (2008, 2009) analyses rule out the proportion of foreign sales, profit margins, firm size, differential domestic and foreign growth, and structural changes such as mergers and acquisitions. Hope et al.'s (2008) results further exclude exchange rates, income taxes, persistence, positive earnings changes, a levels specification, and changes in international cross-listings as alternative explanations. Therefore, as an unintended consequence of their research design, Hope and Kang (2005) and Hope et al. (2008, 2009) eliminate several possible explanations for the higher valuation of foreign earnings.

Although Bodnar and Weintrop (1997) is the only study to directly examine reasons for the higher valuation of the foreign earnings component relative to the domestic earnings component, Christophe (2002) examines reasons for the differential valuation of positive and negative changes in these components and Callen et al. (2005) examine reasons for the differential valuation of the variance of these components, respectively. Other studies in this stream of literature (Hope & Kang, 2005; Hope et al., 2008, 2009) inadvertently rule out additional possible explanations for the differential valuation of these earnings components as a feature of their research design. In conclusion, among the various theoretical arguments for the differential valuation of these components and explanations tested, foreign growth and agency problems affect the differential valuation of foreign and domestic earnings.

2.3 Review of the Tax Accounting Literature

The tax accounting literature additionally examines the valuation of foreign earnings components. The components of foreign earnings that are examined in the tax accounting

literature are (i) the deferred tax liability associated with permanently reinvested foreign earnings (Collins et al., 2001; Oler et al., 2007; Bauman & Shaw, 2008; Bryant-Kutcher et al., 2008; De Waegenaere & Sansing, 2008) and (ii) foreign cash (Campbell et al., 2014; Chen, 2015; Nessa, Shevlin, & Wilson, 2015; Harford, Wang, & Zhang, 2017; Laplante & Nesbitt, 2017). Overall, evidence from this literature suggests that investors are sophisticated in valuing complex foreign tax information. I first review studies in the tax accounting literature that examine the market's valuation of the deferred tax liability associated with permanently reinvested foreign earnings, followed by a review of studies that examine the valuation of foreign cash. I conclude by summarizing investor sophistication demonstrated in the literature.

2.3.1 Literature on the Valuation of the Deferred Tax Liability Associated with PRE

Following the guidance in the Accounting Principles Board (APB) Opinion no. 23 (1972), firms are permitted to designate any foreign earnings they intend to reinvest in foreign operations as "permanently reinvested earnings" (PRE). This designation allows firms to hold foreign earnings overseas and defer repatriation taxes and foreign withholding taxes on the amount of PRE.[8] PRE is recognized in the firms' consolidated earnings, but the deferred tax liability is not recorded. However, firms are required to disclose the deferred tax liability "if practicable to estimate" (Statement of Financial Accounting Standards (SFAS) No. 109 Accounting for income taxes (FASB, 1992). In addition to being unrecognized, the deferred tax liability associated with PRE is seldom disclosed and subject to non-compliance issues (see Ayers, Schwab, & Utke, 2015).

[8] Foreign earnings of U.S. MNCs are taxed at a firm-specific average foreign tax rate. In cases where the average foreign tax rate is greater than the U.S. statutory rate, the firm owes no additional repatriation taxes. In cases where the average foreign tax rate is lower than the U.S. statutory rate, the firm is taxed the differential on repatriation.

Motivated by the open-ended disclosure requirement and managers' conflicting incentives to inform shareholders, while strategically concealing value-relevant information from competitors and tax authorities (see Collins et al., 2001), the central question these studies ask is: what information can investors decipher about the deferred tax liability associated with PRE? Collins et al. (2001) find that investors rely on disclosed amounts, while Oler et al. (2007) show that investors are able to estimate the amount, absent disclosure. Bauman and Shaw (2008) further show that investors rely on reported values more than estimated values of the deferred tax liability, not due to lack of sophistication but because reported values are closer to actual repatriation taxes. More generally, Nessa et al. (2015) show that investors discount foreign earnings where the firm's average foreign rate is lower than the U.S. statutory tax rate, which indicates taxes due on the repatriation of foreign earnings.

Collins et al. (2001) examine whether the market recognizes and values the deferral tax benefit associated with foreign earnings designated as permanently reinvested and the partially disclosed, unrecognized tax liability associated with these foreign earnings. They test the valuation of the deferred tax liability and whether investors discount various disclosures of the deferred tax liability differently. Specifically, they test the valuation of permanently reinvested earnings for a hand-collected sample where the amount disclosed is positive, zero, "not practicable to estimate," or not provided. In general, they find that investors discount the tax liability. Additionally, they find a negative valuation coefficient on PRE only where a positive tax liability is disclosed, while the other three groups are valued similarly. Collins et al. interpret this result as investors' reliance on the information disclosed by management, contrary to anecdotal evidence they present of management obfuscating financial information in the income

tax footnote. They additionally interpret the discount on PRE to mean that investors do not believe the permanence of PRE and anticipate taxes due on repatriation.

Primarily motivated by the repatriation tax holiday introduced by the American Jobs Creation Act (AJCA) of 2004, Oler et al. (2007) study, ex-ante, firms' decisions to repatriate or reinvest foreign earnings and investors' expectations of these firm decisions. Unlike Collins et al., they do not use disclosed amounts but estimate the amount of the deferred tax liability for their sample using the amount of PRE disclosed. In addition to showing the value relevance of this estimated amount, suggesting that investors estimate the deferred tax liability, they also show that investors were able to identify firms most likely to repatriate and value the deferred tax liability accordingly. Consistent with Collins et al. (2001), they find that investors discount the deferred tax liability estimate before the tax holiday became likely (2001-2002) and after the holiday (2005); however, during the period when the repatriation holiday became likely (2003-2004), the deferred tax liability was not value-relevant. This result demonstrates investors' understanding of the dividend deduction rules under the AJCA, and they perform additional tests to rule out valuation effects due to the domestic manufacturing deduction also associated with the AJCA. Oler et al. conclude that the "market is relatively efficient" and "fairly sophisticated" in understanding the valuation implications of the deferred tax liability under the AJCA.

Bauman and Shaw (2008) take the question of value-relevance of the deferred tax liability a step further by asking whether disclosed or estimated amounts are more value-relevant. Acknowledging the information asymmetry between managers and investors and managers' discretion in designating PRE (see Krull, 2004), Bauman and Shaw are concerned with whether investors rely on disclosed amounts. They compare investors' valuation of disclosed amounts and estimated amounts to determine whether investors rely on management disclosure or their

own estimates and find that each component is value-relevant. They also find that disclosed amounts are more value-relevant. In further investigating the reason for this differential valuation, they find that estimates of the deferred tax liability are understated and that disclosed values are closer to actual repatriation taxes. By providing evidence that investors can identify which of the amounts are closer to actual values, Bauman and Shaw's result demonstrates a greater level of investor sophistication than Collins et al. (2001), who interpret investors' reliance on disclosed values as trusting managers' disclosure.

Nessa et al. (2015) test whether, more conceptually, the cost of repatriating foreign earnings, rather than the amount of the deferred tax liability, affects valuation. They find that firms with an average foreign tax rate lower than the U.S. statutory rate receive a lower valuation. They examine whether this lower valuation depends on the likelihood of repatriation but do not find supporting evidence. They measure the likelihood of repatriation using high levels of firms' cash holdings, low foreign investment opportunities, and high financial constraints. They conclude that investors generally anticipate repatriation tax costs for firms facing low average foreign tax rates, and discount foreign earnings for these firms accordingly.

2.3.2 Literature on the Valuation of Foreign Cash

The tax accounting literature on foreign cash valuation generally finds that foreign cash held by firms to avoid repatriation taxes is discounted by investors (Bryant-Kutcher et al., 2008; Campbell et al., 2014; Chen, 2015; Harford et al., 2017; Laplante & Nesbitt, 2017).[9] At a broader level, these studies argue that agency problems, tax rules, and lack of disclosure reduce the value of foreign cash (e.g., Bryant-Kutcher et al., 2008; Campbell et al., 2014; Chen, 2015; Harford et

[9] Motivated by incorrect references to foreign cash, PRE and trapped cash by the media and policy makers, Laplante and Nesbitt (2017) more recently define foreign cash held to avoid repatriation taxes as "trapped cash". In my review of the literature preceding their study, I refer to foreign cash and specify repatriation tax costs consistent with preceding studies.

al., 2017). More specifically, the tax rules pertaining to foreign earnings incentivize firms to hold excess cash in foreign jurisdictions leading to internal financing issues and investment inefficiency (e.g., Bryant-Kutcher et al., 2008; Chen, 2015; Harford et al., 2017).

First, the tax literature argues that agency problems associated with the lower valuation of cash (Jensen, 1986; Jensen & Meckling, 1976) are exacerbated by the distance of foreign operations and non-disclosure of foreign cash (see Campbell et al., 2014; Chen, 2015).

Second, Campbell et al. present that foreign cash and domestic cash do not have similar values since foreign cash is taxed differently. Under the U.S.' worldwide taxation system, foreign earnings are collectively taxed at a firm-year specific average foreign tax rate. Thus, the valuation of total cash reported on a firm's balance sheet is not uniform because it is not taxed at a uniform rate. Additionally, foreign cash may be valued differently than domestic cash because any portion designated as PRE is associated with an unrecognized deferred tax liability.

Third, neither the total amount of foreign cash nor the portion designated as PRE is disclosed, increasing information asymmetry surrounding foreign cash (Bryant-Kutcher et al., 2008; Chen, 2015). Consequently, the literature is motivated by SEC and FASB discussions to introduce foreign cash disclosures (e.g., Campbell et al., 2014; Chen, 2015).

Fourth, the incentive to designate foreign cash as PRE to avoid recognizing a deferred tax liability results in firms holding excess cash in foreign jurisdictions (see Foley et al., 2007). Foreign cash designated as PRE increases liquidity issues for firms as it is locked out due to the tax disincentive to repatriate (see Bryant-Kutcher et al., 2008; Campbell et al., 2014; Chen, 2015).

Finally, excess foreign cash holdings have been found to destroy firm value through inefficient mergers and acquisitions (see Edwards, Kravet, & Wilson, 2016; Hanlon, Lester, &

Verdi, 2015; Harford et al., 2017) and inefficient investments in financial assets (Bryant-Kutcher et al., 2008; Chen, 2015).

Bryant-Kutcher et al. (2008) provide evidence of a higher level of investor sophistication than demonstrated by the literature on the valuation of the deferred tax liability. While these studies show that investors discount PRE based on disclosed values of the deferred tax liability (Collins et al., 2001) or calculate this amount (Oler et al., 2007; Bauman & Shaw, 2008), Bryant-Kutcher et al. show that investors value PRE depending on the underlying reinvestment asset, which is not disclosed. They find that investors discount PRE when firms owing taxes on repatriation reinvest in financial assets, measured using the level of firms' excess cash holdings.[10] This finding is consistent with their argument that firms with the incentive to avoid repatriation taxes are constrained in their investments and sub-optimally invest in financial assets. This trapped cash destroys firm value because it is locked out from value-adding investments. They offer their result as an alternative explanation to the discount on PRE documented by Collins et al. (2001).

Campbell et al. (2014) test the valuation of foreign cash holdings by estimating the location of foreign cash. They argue that foreign cash has a different value than domestic cash because it is taxed at a different rate, triggers a dividend tax in addition to taxes due on repatriation, and, where held as PRE, is associated with an unrecorded deferred tax liability and liquidity constraints. To test the differential valuation of domestic and foreign cash, they estimate the location of cash reported using countries listed in Exhibit 21 of the 10-K and validate their estimates using proprietary U.S. Bureau of Economic Analysis data. They find that their measure of foreign cash is valued lower than their measure of domestic cash and conclude that investors

[10] Bryant-Kutcher et al. (2008) classify firms with average foreign tax rates higher than the U.S. statutory rate as firms owing taxes on repatriation.

estimate the location of cash using information in the 10-K and other sources. They further find that the lower valuation is higher taxes associated with the repatriation of cash rather than unstable economic environments in these countries and find a stronger effect where firms have higher levels of institutional ownership. Therefore, Campbell et al. demonstrate investor sophistication in estimating the location of foreign cash and valuing this cash consistent with tax implications.

The literature proceeds to examine how the repatriation tax cost affects investors' valuation of foreign cash and demonstrates investor sophistication in (i) estimating undisclosed foreign cash and (ii) valuing foreign cash lower than domestic cash, consistent with the consequences of avoiding repatriation taxes. First, these studies find that disclosed foreign cash, estimated foreign cash, and a likelihood indicator of trapped cash are value-relevant. Chen (2015) uses foreign cash disclosed by firms in response to SEC comment letters. Harford et al. (2017) supplement their small sample disclosing foreign cash with a larger sample using the ratio of PRE to assets as a proxy for foreign cash. Laplante and Nesbitt (2017) more precisely define foreign cash held to avoid repatriation taxes as "trapped cash" and, due to limited disclosure, estimate the likelihood of its existence but not the amount.

Second, these studies predict and find that investors value foreign cash less because of agency problems, domestic underinvestment, and inefficient foreign investment. Chen (2015) finds that the lower valuation is magnified where firms have weak corporate governance, limited disclosure of foreign segments, limited access to domestic debt markets, and excess cash holdings. Harford et al. (2017) find that the lower valuation is associated with domestic underinvestment, difficulty raising domestic financing, and higher CEO ownership and industry competition. Laplante and Nesbitt (2017) produce a more clarifying result by showing that poor

corporate governance is associated with the negative valuation of trapped cash, not excess cash. Therefore, the literature shows investor sophistication in recognizing trapped cash, while factoring in agency problems, liquidity issues, and investment inefficiency in their valuation (Chen, 2015; Harford et al., 2017; Laplante & Nesbitt, 2017).

2.3.3 Conclusion

In the tax accounting literature, investors appear to be sophisticated as (i) they recognize and value undisclosed foreign tax amounts, (ii) their estimates match estimates by complex models, (iii) their estimates are consistent with assumptions made in the literature, and (iv) they appear to understand complex tax rules.

First, investors recognize the unrecorded, undisclosed deferred tax liability associated with PRE and undisclosed foreign and trapped cash. Although the IASB and FASB acknowledge that the deferred tax liability is complex to understand and that its disclosure might mislead analysts and investors (see Bauman & Shaw, 2008), studies show that investors rely on disclosed values (Bauman & Shaw, 2008; Collins et al., 2001) and estimate undisclosed values (Bauman & Shaw, 2008; Oler et al., 2007). Although Bauman and Shaw (2008) find that disclosed values of the deferred tax liability are more value-relevant than estimates, they further find that this is not due to the lack of investor sophistication but because these values are more reliable relative to estimates. Oler et al. (2007) also demonstrate investors' ability to estimate, ex-ante, amounts that firms would repatriate under the AJCA tax holiday when provided with limited information on the amounts firms expected to repatriate.[11] The complexity in estimating foreign and trapped cash, given the lack of disclosure, is demonstrated by Laplante and Nesbitt (2017), who estimate a likelihood indicator of trapped cash but not an amount. They explain that estimating the

[11] Firms disclosed wide ranges of the amounts they expected to repatriate under the tax holiday created by the AJCA 2004, setting lower limits as low as 0 USD.

amount of trapped cash is difficult because they cannot unravel instances where foreign cash is not trapped, such as if firms use foreign cash in revolving short-term loans or securitizations. Despite the complexity involved in estimating these values, studies find that their estimates are value-relevant, indicating that investors form similar estimates.

Second, value-relevant amounts are consistent with those estimated using complex models in the literature (e.g., Bates, Kahle, & Stulz, 2009; Hartman, 1985; Scholes; Faulkender & Wang, 2006). For instance, Oler et al. (2007) model firms' decision to repatriate or reinvest foreign earnings by factoring in current taxes if earnings are repatriated, future taxes if earnings are deferred, and implicit taxes associated with the pre-tax rate of return on investments and find that the market anticipates the decision predicted. Expected repatriation amounts estimated by this model are also value-relevant. Estimates of foreign cash are also value-relevant ranging from complex estimates, such as Campbell et al.'s (2014) proxy of trapped cash using Exhibit 21 data and Laplante and Nesbitt's likelihood indicator of trapped cash, to simpler estimates, such as Harford et al.'s (2017) PRE to assets ratio proxy for foreign cash. Additionally, investors recognize values consistent with estimates of firms' excess cash holdings using Faulkender and Wang (2006) and Bates et al. (2009).

Third, evidence of the value-relevance of estimates in the literature also demonstrates the market's agreement with the literature's assumptions. For instance, Bryant-Kutcher et al. (2008) assume that firms with average foreign tax rates higher than the U.S. tax rate repatriate and excess cash holdings proxy for investments in financial assets. In their model, Oler et al. (2007) assume that a firm's decision to repatriate is not affected by the investment horizon or amount of tax but by after-tax rates of return. Also, Laplante and Nesbitt (2017) assume cash is not trapped

for firms with large PRE that do not repatriate under the AJCA and firms using debt to finance repatriations.

Fourth, results in this literature demonstrate that investors understand the tax rules associated with foreign earnings. Oler et al.'s (2007) result indicates that investors understand the complex rules under the AJCA of 2004, particularly the dividends received deduction, limits on the dividend eligible, the extent to which it was available, as well as other shielding provisions. Bryant-Kutcher et al.'s (2008) result that investors recognize foreign investment in financial activities as value-destroying, demonstrates investor sophistication in understanding the financial activities exception under Subpart F of the Internal Revenue Code as well as limitations under the AJCA. Investors also appear to be more sophisticated than policymakers, who interchangeably reference PRE as foreign cash (see Laplante & Nesbitt, 2017), as they are able to disentangle trapped cash from foreign cash and value it less because of its value-destroying characteristics (Chen, 2015; Harford et al., 2017; Laplante & Nesbitt, 2017). In conclusion, within this literature, investors appear to be sophisticated as they appropriately value undisclosed values associated with foreign earnings.

2.4 Comparison of the Financial Accounting and Tax Accounting Literatures

Studies in both financial accounting and tax accounting examine the valuation of foreign earnings components. In this section, I present similarities between the financial accounting and tax accounting studies, followed by dissimilarities between these streams of literature. I present similarities and highlight differences to justify the research questions in this study, presented in the following section concluding this literature review.

2.4.1 Similarities between the Financial Accounting and Tax Accounting Literatures

The financial accounting and tax accounting literature are not only similar in the overarching question they examine regarding investors' valuation of foreign earnings components. They also share similar timelines, firm value measurement, theory of foreign information asymmetry, results that foreign earnings are greater than domestic earnings, and results on the effects of institutional ownership.

2.4.1.1 Timeline. The financial accounting literature began examining the valuation of foreign segment earnings for fiscal years between 1985 and 1989 (Boatsman et al., 1993) and foreign earnings for fiscal years between 1985 and 1993 (Bodnar & Weintrop, 1997). This examination continued to include fiscal years as late as 2004 (Hope et al., 2008; 2009). Sample periods for the studies on the valuation of PRE spanned 1993 (Collins et al., 2001), with Oler et al. (2007) examining investors reactions in 2005, during the repatriation tax holiday provided by the AJCA (2004) and the period preceding it (2003-2004). Studies on foreign cash components examine later fiscal years, beginning as early as 1993 (Campbell et al., 2014), up until 2013 (Chen 2015; Nessa et al., 2015). Therefore, studies in both streams of literature provide evidence of valuation for largely common time periods.

2.4.1.2 Firm Value Measurement. Additionally, differences in the two streams of literature cannot be attributed to different firm value measurement methods as the tax accounting literature largely uses returns regressions (except for Collins et al., 2001 and Laplante & Nesbitt, 2017). The tax accounting literature also decomposes total earnings into domestic and foreign components following Bodnar and Weintrop (1997) (see Bauman & Shaw, 2008; Bryant-Kutcher et al., 2008; Campbell et al., 2014; Collins et al., 2001; Harford et al., 2017; Nessa et al., 2015; Oler et al., 2007).

2.4.1.3 Agency Theory. Both streams of literature predict that foreign operations involve information asymmetry and agency problems, consequently reducing firm value. In the financial accounting literature, Christophe (2002) provides evidence of agency problems reducing the valuation of foreign earnings, while Chen (2015), Harford et al. (2017), and Laplante and Nesbitt (2017) provide evidence of agency problems affecting the valuation for foreign and trapped cash.

2.4.1.4 Foreign Earnings Valued Higher Than Domestic Earnings. Tests in both streams of literature show a larger coefficient on the foreign earnings component relative to the domestic earnings component. The tax accounting literature shows that foreign reported earnings are still capitalized higher than domestic reported earnings after controlling for the foreign tax values examined in these studies (see Bauman & Shaw, 2008; Bryant-Kutcher et al., 2008; Campbell et al., 2014; Collins et al., 2001; Nessa et al., 2015; Oler et al., 2007). As an unintended consequence, this result rules out an alternative explanation, not explicitly stated or examined, that the unrecorded deferred tax liability or foreign cash affects the differential valuation of foreign and domestic earnings components.

2.4.1.5 Agreement in Investor Sophistication Tests. Although Callen et al. (2005) test the variance contribution of domestic and foreign components while Campbell et al. (2014) test the mean effects of foreign cash, they provide similar results in their institutional ownership tests. Callen et al. find that low levels of institutional ownership are related to the greater valuation of domestic earnings. They also find that long-term investors value domestic and foreign earnings significantly differently relative to short-term investors. Campbell et al. show that higher levels of institutional ownership are associated with a larger discount on excess foreign cash. Therefore, both sets of studies show that discounts on foreign earnings are prominent for institutional investors.

2.4.2 Differences between the Financial Accounting and Tax Accounting Literatures

Although the two sets of literature share a number of similarities, they differ in their (i) perceptions of investors' ability to handle complexity and evidence of investor sophistication, (ii) understanding of the tax mechanisms that ultimately affect the value of foreign earnings, and (iii) general perceptions of the foreign environment.

2.4.2.1 Perception of Investors' Ability to Handle Complexity. The financial accounting literature views the complexity of foreign operations as a reason for the lower valuation of foreign earnings (e.g., Callen et al., 2005; Hope et al., 2008, 2009), while the tax accounting literature shows that investors can estimate complex foreign amounts and value them accordingly, despite the opacity associated with foreign operations and the complexity of tax rules (e.g., Bryant-Kutcher et al., 2008; Campbell et al., 2014; Chen, 2015; Laplante & Nesbitt, 2017; Oler et al., 2007). The financial accounting literature additionally shows that investors do not fully incorporate all publicly available information and, consequently, misprice foreign earnings (Bartov & Bodnar, 1994; Thomas, 1999). Hope et al. (2008) also find that improved segment disclosure helps investors understand the persistence of foreign earnings.

2.4.2.2 Understanding of Taxation Rules Involving Foreign Earnings. Understanding tax mechanisms affecting foreign earnings valuation helps the tax accounting literature examine the valuation of foreign cash more deeply. While the financial accounting literature generally explores the effects of agency problems on the value of foreign earnings (Christophe, 2002), the tax accounting literature specifically ties agency problems to foreign cash being locked out due to disincentives to repatriate (e.g., Campbell et al., 2014; Chen, 2015; Harford et al., 2017; Laplante & Nesbitt, 2017) and examines this question more precisely. In addition, the financial accounting literature examines whether income taxes affect the differential valuation of foreign

earnings but uses pre-tax and after-tax reported earnings values to rule out the effect of taxes (e.g., Callen et al., 2005; Hope & Kang, 2005; Hope et al., 2008). However, the tax accounting literature realizes that foreign earnings reported do not include the deferred tax liability associated with PRE, repatriation taxes, dividend taxes, or foreign withholding taxes (e.g., Collins et al., 2001; Campbell et al., 2014).

2.4.2.3 General Perception Differences. Other than differences in perceiving investors' ability to handle the complexity of foreign environments, the two sets of literature also perceive different effects of the foreign environment on the earnings. For instance, while the financial accounting literature presents internalizing market imperfections as a benefit of geographic diversification (e.g., Bodnar et al., 1997), the tax accounting literature points out that differing tax rules across jurisdictions lock investments out and create internal market frictions (e.g., Chen, 2015; Harford et al., 2017).

2.5 Conclusion

In this literature review, I first reviewed the financial accounting literature examining the valuation of domestic and foreign earnings and presented reasons for the differential valuation of these components argued and tested in the literature. Next, I reviewed the tax accounting literature examining the valuation of the deferred tax liability associated with foreign earnings designated as PRE and the valuation of foreign and trapped cash. I also compared the two sets of literature in terms of their theoretical viewpoints, research design, and results. Based on my review of the literature, I conclude that the valuation of domestic and foreign earnings is an open question for the following reasons:

First, the financial accounting literature provides source-dependent evidence on the valuation of domestic and foreign earnings, which this study reconciles by using both disclosure

sources of foreign information. Studies using Rule 4-08(h) data as the source of foreign earnings information consistently show that the foreign earnings component is valued more than the domestic earnings component (e.g., Bodnar & Weintrop, 1997; Christophe, 2002; Hope & Kang, 2005). However, studies that show domestic earnings are valued higher than foreign earnings use (a) income reported in segment disclosures under older SFAS 131 (e.g., Boatsman et al., 1993; Thomas, 2000), (b) sales in segment disclosures (e.g., Christophe & Pfeiffer, 2002), and (c) geographic diversification studies (e.g., Denis et al., 2002). Mixed results also exist in the geographic diversification literature about the effect of foreign operations on firm value (e.g., Bodnar et al., 1997; Denis et al., 2002). The review of the financial accounting literature also highlights the importance of disentangling the concept of "economic earnings" from reported earnings. These studies argue economic reasons for differences in the valuation of foreign and domestic earnings but measure the valuation of these components using reported earnings. Therefore, I define domestic and foreign earnings consistent with Bodnar and Weintrop (1997) but estimate earnings affected by economic properties, that is, economic earnings, using geographic segment information.

Second, the financial accounting literature does not incorporate taxation rules in their examination of foreign earnings. As demonstrated in the previous section, the tax accounting literature more accurately incorporates the effect of taxation rules on foreign values and, thus, predicts and examines the valuation of foreign components more precisely. Therefore, I approach the question of foreign earnings valuation, posed by the financial accounting literature, incorporating tax knowledge that income shifted affects the valuation of domestic and foreign reported values (e.g., Collins et al., 1998).

Third, this review highlights that the two streams of literature provide different sets of evidence on investor sophistication in valuing complex foreign information. Although these studies examine a similar time period and similarly measure firm value, the financial accounting literature argues that foreign earnings information is complex and that disclosure improves valuation (e.g., Callen et al., 2005; Hope et al., 2008, 2009) whereas the tax accounting literature provides consistent evidence that investors estimate and value unrecognized and undisclosed foreign amounts (e.g., Bryant-Kutcher et al., 2008; Campbell et al., 2014; Chen, 2015; Oler et al., 2007). To reconcile this inconsistency, I test differences in valuation across different levels of investor sophistication.

Given the inconsistencies within the financial accounting literature and between the financial and tax accounting literature streams, this study re-examines the question about the valuation of foreign earnings introduced by Boatsman et al. (1993) and Bodnar and Weintrop (1997). Since the financial accounting literature argues economic reasons for the differences between domestic and foreign earnings valuation, I create measures of domestic and foreign economic earnings and examine the valuation of these components. I further incorporate tax knowledge about income shifted between tax jurisdictions and examine the valuation of the shifted components of reported earnings. Since investor sophistication is a key factor in the valuation of foreign earnings components (see Bodnar & Weintrop, 1997; Callen et al., 2005; Campbell et al., 2014; Collins et al., 2001), I also directly test differences in valuation across different levels of investor sophistication.

3. Model and Hypothesis Development

3.1 Model

This section introduces and develops my model, decomposing total earnings into economic earnings and income shifted components. Before presenting my model, I define the concepts of economic earnings and income shifted in this study. I define economic earnings as earnings created within a specific jurisdiction, using resources in that jurisdiction. This definition is consistent with Hines and Rice (1994), who define economic earnings as those created by capital and labor in a given jurisdiction. I view the difference between economic earnings created in a jurisdiction and earnings reported for that jurisdiction, following Rule 4-08(h), as income shifting. More precisely, this residual amount captures income shifted through financial activities for tax purposes.

Prior studies provide evidence of the value-relevance of domestic and foreign reported earnings and the differential valuation of the two components (e.g., Bodnar & Weintrop, 1997; Christophe, 2002). These studies argue that jurisdictions' economic differences affect the differential valuation of domestic and foreign earnings (e.g., Boatsman et al., 1993; Bodnar & Weintrop, 1997). However, these studies measure economic earnings for a specific jurisdiction using earnings reported for that jurisdiction, which is a mix of economic earnings from domestic and foreign jurisdictions. While a subsidiary's economic profit is a function of capital inputs, labor inputs, and productivity (see Hines & Rice, 1994), the tax incentive to shift income between subsidiaries arises from different tax regulations across jurisdictions (Klassen, Lang, & Wolfson 1993; Klassen & Laplante 2012a; Mills & Newberry, 2004).

Income shifting between jurisdictions is motivated by different tax rates, government-provided incentives, and tax regulation (Altshuler & Grubert 2006; Bernard, Jensen, & Schott,

2006; De Waegenaere, Sansing, & Wielhouwer, 2006; Klassen et al., 1993; Klassen & Laplante 2012b; Markle, 2015). According to the income shifting literature, MNCs may shift income through financial activities, such as transfer pricing, or real activities, such as relocating assets and employees (Clausing, 2003; Grubert, 2003). MNCs use financial activities such as intercompany transfers and intercompany debt to shift income between locations (Clausing, 2003; Grubert & Mutti, 1991; Harris, Morck, Slemrod, & Yeung, 1991; Jacob, 1996; Mintz & Smart, 2004). Additionally, MNCs may shift real activities by relocating capital and labor, thereby shifting income produced by these real activities. MNCs may also shift income by strategically locating more flexible expenses related to interest, R&D, advertising, royalties, and intangibles (Clausing, 2003; Harris, 1993).

This study conceptualizes and measures economic earnings and income shifted in the short term for a firm's fiscal year. Short-term strategies exclude shifting income through relocating assets and operations, which are long-term income shifting strategies that remain stable over time. Therefore, I define income shifted as those amounts that are relocated through financial activities, consistent with De Simone, Mills, and Stomberg (2019), who define income shifting as "changing the location of where income is reported through intercompany payments" (p. 695). However, while De Simone et al.'s (2019) definition of income shifting includes income shifted for non-tax reasons due to their measurement approach, I expect my "residual approach" of measuring income shifted to capture income shifted for tax purposes.

Some non-tax incentives to shift income include profitability (De Waegenaere & Sansing, 2008; Grubert & Mutti 1991; Hines & Rice 1994; Klassen & Laplante 2012b), financial reporting incentives (Klassen & Laplante, 2012b), bypassing capital controls (Harris et al., 1991), and low litigation risk (Azémar, 2010). I assume that shifting earnings between foreign

and domestic jurisdictions is motivated by the tax differential between these jurisdictions. Therefore, I define tax-motivated income shifting in this study as the difference between economic earnings created in a jurisdiction and earnings reported for that jurisdiction under Rule 4-08(h).

Since the original studies on the valuation of foreign earnings test the valuation of reported earnings (e.g., Bodnar & Weintrop, 1997; Christophe, 2002), it is unclear whether their valuation results are due to investors' valuation of (a) reported earnings, (b) the underlying economic properties of earnings highlighted by these studies, or (c) tax strategies employed by MNCs. Therefore, I decompose total earnings into economic earnings and income shifted components to examine the valuation of foreign earnings more precisely.

In the foreign earnings valuation literature, income reported as domestic or foreign is assumed to have been produced in those jurisdictions. Bodnar and Weintrop (1997) modify a basic model of the value (*V*) of a firm *i* at time *t* by decomposing total earnings (*TotalNI*) into domestic (*DomNI*) and foreign (*ForNI*) earnings components:

$$\Delta V_{i,t} = \alpha_o + \alpha_1 \Delta TotalNI + \varepsilon_{i,t} \quad (3.1)$$

$$\Delta V_{i,t} = \beta_o + \beta_1 \Delta DomNI_{i,t} + \beta_2 \Delta ForNI_{i,t} + \varepsilon_{i,t} \quad (3.2)$$

However, domestic and foreign income reported in the financial statements comprise earnings produced in those jurisdictions, and earnings shifted into those jurisdictions. A U.S. MNC's economic earnings created in a specific jurisdiction before shifting are not disclosed in the financial statements. The literature relies on (i) foreign earnings reported in the General Notes to the Financial Statements – Income Tax Expense (SEC Regulation 210.4-08(h)) and (ii) foreign revenues reported in geographic segment disclosures under SFAS No. 14 - Financial Reporting for Segments of a Business Enterprise (SFAS No. 131 - Disclosures about Segments

of an Enterprise and Related Information, now ASC 280-10-50) to measure foreign earnings. However, neither of these sources report earnings by location. Income reported under Rule 4-08(h) is ascribed to the jurisdiction of the legal entity to which earnings are shifted.[12] Additionally, segment revenues reported in geographic segment disclosures are based on external customer locations and not the location of operations.[13] Dyreng and Markle (2016) estimate inbound and outbound income shifting as the association between firms' segment revenues and reported pre-tax domestic and foreign income. Using a similar intuition, I decompose a firm's reported domestic earnings and foreign earnings reported under Rule 4-08(h) into economic earnings and income shifted components.

$$\text{DRepEarnings} = \text{DEconEarnings} \mp \text{IncomeShifted} \quad (3.3a)$$

$$\text{FRepEarnings} = \text{FEconEarnings} \mp \text{IncomeShifted} \quad (3.3b)$$

where DRepEarnings is domestic reported earnings, FRepEarnings is foreign reported earnings, DEconEarnings and FEconEarnings are economic earnings created in the domestic and foreign jurisdictions, respectively, and IncomeShifted represents the amount of income shifted between domestic and foreign jurisdictions.

Following Bodnar and Weintrop's (1997) decomposition of total earnings into domestic and foreign reported earnings, I further partition reported earnings into four components, each capturing economic and tax differences. I begin by decomposing the conceptual measures of domestic economic earnings and foreign economic earnings. A portion of economic earnings created in a jurisdiction stays and is part of that jurisdiction's reported earnings, while the remaining portion is shifted and becomes part of the other jurisdiction's reported earnings.

$$\text{DEconEarnings} = \text{DEcon\_Res} + \text{DShiftOut} \quad (3.4)$$

[12] SEC Regulation 210.4-08(h) – General Notes to Financial Statements – Income Tax Expense (Rule 4-08(h))
[13] These requirements are listed under FASB Accounting Standards Codification (ASC) 280-10-50-41.

$$\text{FEconEarnings} = \text{FEcon\_Res} + \text{FShiftOut} \quad (3.5)$$

DEcon_Res is the portion of economic earnings that remains in the domestic jurisdiction, and FEcon_Res is the portion that remains in the foreign jurisdiction. I refer to these components as resident economic earnings. DShiftOut and FShiftOut represent income shifted out of the domestic and foreign jurisdictions, respectively.

Reported earnings exclude the portion of economic earnings that is shifted out and includes earnings shifted into the jurisdiction.

$$\text{DRepEarnings} = \text{DEconEarnings} - \text{DShiftOut} + \text{FShiftOut} \quad (3.6)$$

$$\text{FRepEarnings} = \text{FEconEarnings} - \text{FShiftOut} + \text{DShiftOut} \quad (3.7)$$

I assume that MNCs shift income in one direction, between domestic and foreign jurisdictions, because the U.S.' worldwide tax system creates an incentive to shift between these jurisdictions. Under the U.S. tax system, earnings reported domestically are taxed at the U.S. statutory tax rate, while earnings reported as foreign are taxed collectively at an average foreign tax rate. The difference between the two tax rates creates an incentive for firms to shift income from the lower rate jurisdiction to the higher rate jurisdiction. That is, the tax rate differential, among other credits and incentives, determines the direction in which earnings are shifted. Accordingly, economic earnings shifted out of one jurisdiction are economic earnings shifted into the other; if the value of income shifted out of one jurisdiction is positive and non-zero, the amount of income shifted out of the other jurisdiction is zero.[14] I simplify the disaggregation of reported earnings in Equations (3.6) and (3.7) by including only the portion that stays, and earnings shifted into that jurisdiction and re-write Equations (3.6) and (3.7) as:

[14] An exception in the literature, Dyreng and Markle (2016) estimates simultaneous inbound and outbound shifting for a given fiscal period. I assume that income is shifted in a single direction for a given firm-year consistent with Collins et al. (1998) and Klassen and Laplante (2012a). I present conceptual and measurement differences in income shifting proxies in detail in Chapter 5.

$$\text{DRepEarnings} = \text{DEcon\_Res} + \text{FShiftOut} \quad (3.8)$$

$$\text{FRepEarnings} = \text{FEcon\_Res} + \text{DShiftOut} \quad (3.9)$$

An alternate way to arrive at the amount of income shifted, when reported and economic earnings values are known, is to calculate the difference between reported earnings and economic earnings in a given jurisdiction. A positive difference between a jurisdiction's reported earnings and economic earnings indicates income shifted into the jurisdiction, whereas a negative difference indicates income shifted out of that jurisdiction.

$$\text{DNetShift} = \text{DRepEarnings} - \text{DEconEarnings} \quad (3.10)$$

$$\text{FNetShift} = \text{FRepEarnings} - \text{FEconEarnings} \quad (3.11)$$

DNetShift represents the value of income shifted out of the foreign jurisdiction into the domestic jurisdiction, and FNetShift represents the value of income shifted out of the domestic jurisdiction into the foreign jurisdiction. The magnitude of these amounts is the same whether it is calculated as the difference between domestic reported and economic earnings or foreign reported and economic earnings, and the sign indicates the direction of shifting. For example, if DNetShift is positive, it indicates income is shifted into the U.S., and as a result, FNetShift is negative, whereas if DNetShift is negative, it indicates income shifted out of the U.S. and FNetShift has a positive value. The relation is:

$$\text{DNetShift} = -\text{FNetShift} \quad (3.12)$$

For simplicity, I use NetShift to represent the magnitude of income shifted, such that:

$$\text{NetShift} = |\text{DNetShift}| = |\text{FNetShift}| \quad (3.13)$$

Thus, I measure shifted income in two ways: (i) as the portion of economic earnings that is shifted out (DShiftOut, FShiftOut) and (ii) the difference between reported and economic earnings (DNetShift, FNetShift). While the first set of measures (Equations (3.4) and (3.5))

separates the values of income shifted by direction, such that one measure is zero if income is shifted in the opposite direction, the second set of measures substitute for each other in the model. The second set of measures (Equations (3.10) and (3.11)), DNetShift and FNetShift, do not separately measure income shifting by direction and take on negative values if income is shifted in the opposite direction. Since the direction of shifting has different valuation implications, I use the first set of measures to capture income shifted out of the U.S. (DShiftOut) and income shifted into the U.S. (FShiftOut). I illustrate calculations of these measures with a diagram and numerical example in the following paragraphs.

The following equations elaborate on the relation between the two sets of measures and measure income shifting more precisely. When it appears that income is shifted out of the U.S., that is, domestic economic earnings is greater than domestic reported earnings (DNetShift <0), the variable measuring the portion of domestic economic earnings shifted out, DShiftOut, is the value of income shifted, NetShift in Equation (3.10).

$$\text{DShiftOut} = \text{NetShift} \quad \text{if DNetShift} < 0 \tag{3.14}$$

When it appears that no income has been shifted out of the domestic jurisdiction, that is, when domestic reported earnings are greater than domestic economic earnings (DNetShift >= 0), the portion of domestic economic earnings shifted out is 0.

$$\text{DShiftOut} = 0 \quad \text{if DNetShift} \geq 0 \tag{3.15}$$

Similarly, when foreign economic earnings is greater than foreign reported earnings (FNetShift <0), the portion of foreign economic earnings shifted out is the net value of income shifted (NetShift):

$$\text{FShiftOut} = \text{NetShift} \quad \text{if FNetShift} < 0 \tag{3.16}$$

When it appears that no income has been shifted out of the foreign jurisdiction, that is, when foreign reported earnings are greater than foreign economic earnings (FNetShift >= 0), the portion of foreign economic earnings shifted out is 0.

$$\text{FShiftOut} = 0 \qquad \text{if FNetShift} \geq 0 \tag{3.17}$$

Therefore, DShiftOut represents the portion of domestic economic earnings shifted out and is positive when income is shifted out of the U.S., and 0 otherwise. Similarly, FShiftOut represents the portion of foreign economic earnings shifted out and is positive when income is shifted into the U.S. and is 0 otherwise.

Next, I calculate the values of economic earnings that remain in their respective jurisdictions as the difference between economic earnings and the portion of earnings shifted out.

$$\text{DEcon\_Res} = \text{DEconEarnings} - \text{DShiftOut} \qquad \text{if DEconEarnings} \geq \text{DShiftOut} \tag{3.18}$$

$$\text{FEcon\_Res} = \text{FEconEarnings} - \text{FShiftOut} \qquad \text{if FEconEarnings} \geq \text{FShiftOut} \tag{3.19}$$

DEcon_Res is the portion of domestic economic earnings reported domestically, and FEcon_Res is the portion of foreign economic earnings reported as foreign.

However, in cases where the value of economic earnings is less than the value of earnings shifted out, the value of economic earnings that remains in a jurisdiction is equal to 0.

$$\text{DEcon\_Res} = 0 \qquad \text{if DEconEarnings} < \text{DShiftOut} \tag{3.20}$$

$$\text{FEcon\_Res} = 0 \qquad \text{if FEconEarnings} < \text{FShiftOut} \tag{3.21}$$

Using the relations above, the decomposition of total earnings into economic earnings and income shifted is the following:

$$\text{Total Earnings} = \text{DRepEarnings} + \text{FRepEarnings} \tag{3.22}$$

Substituting from (3.8) and (3.9):

$$\text{Total Earnings} = \text{DEcon\_Res} + \text{FShiftOut} + \text{FEcon\_Res} + \text{DShiftOut} \tag{3.23}$$

Re-arranging and regrouping the terms:

$$\text{Total Earnings} = \text{DEcon\_Res} + \text{DShiftOut} + \text{FEcon\_Res} + \text{FShiftOut}$$

$$\text{Total Earnings} = \text{DEconEarnings} + \text{FEconEarnings} \quad (3.24)$$

Figure 1 illustrates the four new components of reported earnings developed above. The first diagram shows the relationship between reported earnings components and economic components that remain in their respective jurisdictions when income is shifted out of the domestic jurisdiction such that DShiftOut ≥ 0 and FShiftOut = 0. The second diagram presents the relationships between the components when income is shifted out of the foreign jurisdiction such that FShiftOut ≥ 0 and DShiftOut = 0.

To further illustrate using a numerical example, consider a firm that reports domestic earnings of USD 10 million and foreign earnings of USD 14 million, such that total earnings equal USD 24 million. I estimate economic earnings of USD 12 million for, each, domestic and foreign jurisdictions. Using Equations (3.10) and (3.11), the amount of income shifted is USD 2 million.

$$\text{DNetShift} = \text{DRepEarnings} - \text{DEconEarnings} = 10 - 12 = -2$$

$$\text{FNetShift} = \text{FRepEarnings} - \text{FEconEarnings} = 14 - 12 = 2$$

From Equation (3.13), the absolute value of income shifted, NetShift, equals USD 2 million. The difference between domestic reported and domestic economic earnings, DNetShift, is negative, indicating that the MNC shifts income out of the U.S. To capture values for both directions of shifting in my model, I measure the portion of domestic economic earnings shifted out, DShiftOut, using Equation (3.14):

$$\text{DShiftOut} = \text{NetShift} = 2$$

The difference between foreign reported and foreign economic earnings, FNetShift, is positive, indicating income shifting to the foreign jurisdiction, such that foreign reported earnings are greater than foreign economic earnings. I use Equation (3.17) to measure the portion of economic earnings shifted out of the foreign jurisdiction into the U.S.:

$$\text{FShiftOut} = 0$$

Next, I calculate the portions of economic earnings that remain in their respective jurisdictions. Since the amounts of income shifted out of each jurisdiction is less than the economic earnings of those jurisdictions, I use Equations (3.18) and (3.19) to calculate portions that remain:

$$\text{DEcon\_Res} = \text{DEconEarnings} - \text{DShiftOut} = 12 - 2 = 10$$

$$\text{FEcon\_Res} = \text{FEconEarnings} - \text{FShiftOut} = 12 - 0 = 12$$

Finally, we can check these values using Equations (3.8) and (3.9):

$$\text{DRepEarnings} = \text{DEcon\_Res} + \text{FShiftOut} = 10 + 0 = 10$$

$$\text{FRepEarnings} = \text{FEcon\_Res} + \text{DShiftOut} = 12 + 2 = 14$$

Now that I have decomposed reported earnings into economic and income shifted components, I present valuation models using these measures. First, I substitute the economic earnings measures presented in Equation (3.24) in the valuation Equation (3.2):

$$\Delta V_{i,t} = \gamma_o + \gamma_1 \Delta DEconEarnings_{i,t} + \gamma_2 \Delta FEconEarnings_{i,t} + \varepsilon_{i,t} \quad (3.25)$$

I use this model to test the value-relevance of domestic and foreign economic earnings.

Next, I substitute the portions of economic earnings that remain and income shifted components, presented in Equation (3.23), in the valuation Equation (3.2):

$$\Delta V_{i,t} = \delta_o + \delta_1 \Delta DEcon\_Stay_{i,t} + \delta_2 \Delta DShiftOut_{i,t} + \delta_3 \Delta FEcon\_Stay_{i,t} + \delta_4 \Delta FShiftOut_{i,t} + \varepsilon_{i,t} \quad (3.26)$$

I use this model to test the value-relevance of the income shifted components of domestic and foreign reported earnings.

3.2 Hypothesis Development

In this section, I develop the hypotheses tested in this study. The first set of hypotheses predicts that economic earnings and income shifting components are value-relevant. The second set of hypotheses predicts these components' value-relevance for different levels of investor sophistication, which I measure using two groups: institutional investors and analysts.

3.2.1 Hypotheses H1a and H1b: Value-relevance of Domestic and Foreign Economic Earnings

I predict that investors recognize economic earnings in domestic and foreign jurisdictions because earnings created in a jurisdiction reflect the current and future value of earnings associated with that jurisdiction. Additionally, although economic values are not reported, I expect investors to recognize these amounts as studies provide evidence that investors value unrecognized accounting information (e.g., Barth, 1991; Landsman, 1986).

First, I hypothesize that investors recognize the value of economic earnings created domestically. I predict that investors recognize domestic economic earnings because information about these earnings is easily accessible to investors (Duru & Reeb, 2002; Thomas, 1999). Additionally, the home bias literature documents bias in investors' portfolios toward owning stock of firms in their home country rather than foreign firms' equity and attribute it to cognitive bias toward domestic information (French & Porterba, 1991; Kang & Stulz, 1997). More recent home-bias literature, acknowledging easy access to global information in the current information economy, presents that investors make above-market gains by choosing to pay attention to domestic information (Huang, 2015; Van Nieuwerburgh & Veldkamp, 2009). Therefore, since

investors are sophisticated in valuing unrecognized amounts and can easily process information in the domestic jurisdiction, I predict that investors recognize the underlying component of earnings created in the domestic jurisdiction.

H1a: Domestic economic earnings is value-relevant.

Next, I predict that investors recognize and value economic earnings created in the foreign jurisdiction. Foreign jurisdictions provide risks and opportunities distinct from the domestic environment (Boatsman et al., 1993; Bodnar & Weintrop, 1997). On the one hand, expanding to foreign markets positively affects firm value as foreign markets provide additional growth opportunities for firms once they have grown in the domestic market (Kogut, 1983). They also provide an avenue for firms to diversify and take advantage of market imperfections (Errunza & Senbet, 1981, 1984; Morck & Yeung, 1991). On the other hand, foreign markets increase firms' exposure to risk (Kinney, 1972; Michel & Shaked, 1986). Studies also show that firm value may decrease because of costs associated with information asymmetry between headquarters and foreign subsidiaries (Myerson, 1982; Harris, Kreibel, & Raviv, 1982) and barriers to entry (Bentolila & Bertola, 1990; Dixit, 1989; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002). Moreover, foreign political and institutional environments affect firm valuation (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2002). Therefore, earnings created in a foreign jurisdiction affect firm value, and I predict that investors recognize this amount.

H1b: Foreign economic earnings is value-relevant.

Alternately, either domestic or foreign economic earnings components may not be value-relevant because estimating these underlying values is complex. The complexity of jurisdiction-specific earnings is demonstrated by the motivation behind studies on the valuation of the reported earnings components, which examined the usefulness of disclosure to investors (e.g.,

Boatsman et al., 1993; Bodnar & Weintrop, 1997; Christophe & Pfeiffer, 2002; Hope et al., 2008, 2009; Thomas, 2000). Boatsman et al. (1993) showed that investors valued segment information similarly under SFAS 14, whereas Thomas (2000) showed that segment information is value-relevant after modifying the original model. Thomas (2000) and Christophe and Pfeiffer (2002) demonstrated the usefulness of geographic segment disclosures under SFAS 14, anticipating SFAS 131, which would provide less disaggregated information (see Herrmann & Thomas, 2000). Hope et al. (2008, 2009) further examined the usefulness of geographic segment disclosures under SFAS 131. The motivation behind these studies suggests investors find it complex to value jurisdiction-specific or foreign earnings information, consistent with studies demonstrating the complexity of foreign information (e.g., Duru & Reeb; Thomas, 1999). Therefore, the complexity of estimating this undisclosed information is consistent with the null hypothesis that economic earnings components are not value-relevant.

Similar to Bodnar and Weintrop (1997), I predict the value-relevance of domestic and foreign earnings components but do not predict whether the valuation coefficients are positive or negative. I do not predict the valuation coefficients' signs because valuation coefficients may differ due to these earnings' cross-sectional properties. Prior literature shows that the valuation of domestic and foreign earnings components vary by periods examined (e.g., Boatsman et al., 1993; Bodnar & Weintrop, 1997; Christophe, 2002) and operating regions (e.g., Boatsman et al., 1993; Christophe & Pfeiffer, 2002; Thomas, 2000).

Although I expect significant differences between domestic and foreign economic earnings components, I do not predict differences in their relative valuation. Although the literature consistently finds that foreign reported earnings is valued higher than domestic reported earnings (e.g., Bodnar & Weintrop, 1997; Christophe, 2002; Hope & Kang, 2005; Hope

et al., 2008, 2009), the financial accounting literature presents economic reasons that may result in either the higher or lower valuation of foreign earnings (see Chapter 2 Section 2).

Additionally, prior literature shows that these components' relative valuation is affected by cross-sectional characteristics such as growth opportunities and agency problems (Bodnar &Weintrop, 1997; Christophe, 2002). On the one hand, investors may value domestic economic earnings higher than foreign economic earnings if they perceive foreign operations as more uncertain or risky (see Boatsman et al., 1993; Bodnar & Weintrop, 1997), foreign information as complex (see Callen et al., 2005; Hope et al., 2008, 2009), or management difficulties and moral hazard problems exacerbated by distance (see Bodnar et al., 1997; Christophe, 2002; Denis et al., 2002). On the other hand, investors may value foreign economic earnings higher than domestic economic earnings because investors perceive opportunities for expansion (see Bodnar & Weintrop, 1997; Christophe 2002) and gains from diversification (see Bodnar et al., 1997; Denis et al., 2002). Therefore, I expect domestic and foreign economic earnings components to be valued significantly differently than each other but do not predict which component is valued higher on average for the sample.

3.2.2 Hypotheses H1c and H1d: Value-relevance of Shifted Earnings Components

Next, I predict that income shifted from either the domestic or foreign jurisdictions are value-relevant. I predict that these components are value-relevant because they reflect the jurisdiction's economic earnings properties from which they are shifted out. I also predict income shifted components are value-relevant because they reflect tax savings created by the income shifting strategy (e.g., Collins et al., 1998; Desai & Dharmapala, 2009; Gramlich, Limpaphayom, & Rhee, 2004). Therefore, earnings that are shifted between jurisdictions have additional tax-saving valuation implications compared to economic earnings that remain in their

home jurisdictions and different economic properties compared to economic earnings in the jurisdiction to which they are shifted. Although I do not formally predict this relation, I expect that shifted earnings components are valued differently than economic earnings components.

I argue that investors estimate the amount of income shifted between domestic and foreign jurisdictions because of its tax relevance, although this amount is not disclosed. Studies show that investors value tax-related amounts such as taxable income (Ayers, Jiang, & Laplante, 2009), deferred tax liabilities (Amir, Kirschenheiter, & Willard, 1997; Givoly & Hayn, 1992), deferred tax assets, valuation allowances, and adjustments for tax law changes (Ayers, 1998). The literature also shows that investors can infer more complex tax values related to foreign jurisdictions, namely PRE and the associated deferred tax liability (e.g., Bauman & Shaw, 2008; Collins et al., 2001; Oler et al., 2007), trapped cash (Laplante & Nesbitt, 2017), and tax-related foreign cash (Campbell et al., 2014; Chen, 2015; Harford et al., 2017). Therefore, I expect that components of earnings that are shifted out of either the domestic or foreign jurisdiction are value-relevant.

H1c: Income shifted out of the domestic jurisdiction is value-relevant.

H1d: Income shifted into the domestic jurisdiction is value-relevant.

Alternately, investors may not be able to recognize income shifted. In general, investors may have difficulty valuing income shifting activities because the amounts and transactions are not disclosed or publicly available. For instance, De Simone et al. (2019) use confidential IRS audit data to examine income shifting transactions of U.S. MNCs. Income shifting activities may also be complex to estimate, similar to amounts of deferred tax liabilities (see Ohlson & Penman, 1992). These earnings components may not be value-relevant is that obtaining relevant information is costly to investors. Plumlee (2003) provides evidence that analysts do not

incorporate more complex information in their estimates of changes in firms' effective tax rates because the costs of incorporating this information outweigh the benefits of providing more accurate forecasts. Bauman and Shaw (2008) point out that although managers take advantage of changes in the effective tax rate to manage earnings in the fourth quarter (Dhaliwal, Gleason, & Mills, 2004), investors price this change in effective tax rates (Schmidt, 2006). Additionally, although tax accounting studies provide evidence of investors' estimating and valuing potential repatriation of foreign cash and foreign cash amounts, Nessa et al. (2017) show that investors' valuation of foreign earnings depends on the average foreign tax rate rather than the likelihood of firm's repatriating foreign earnings. Therefore, investors may not be sufficiently sophisticated to recognize income shifting activities and value them accordingly.

Additionally, I do not predict the signs on the valuation coefficients of the income shifted components. I expect these to vary based on the economic properties of income shifted or characteristics of the destination jurisdiction. I expect that reinvestment and growth opportunities or tax reporting benefits of the destination jurisdiction might affect the valuation of the shifted components. Positive coefficients on these components may be associated with economic benefits in either the home or destination jurisdictions, or tax-reporting benefits of the destination jurisdiction. Negative coefficients may be associated with shifting that destroys firm value, such as shifting to a mature or saturated market or shifting that increases firms' tax liabilities.

I also do not predict whether income shifted out of the domestic jurisdiction is valued more or less than income shifted out of the foreign jurisdiction. I assume and measure tax-motivated income shifting, which occurs in a single direction from high to low tax jurisdiction. In a given year, a firm shifts income either out of or into the domestic jurisdiction, and comparing the relative valuation of income shifted out of the domestic jurisdiction to income

shifted into the domestic jurisdiction involves comparing the valuation of income shifted across firms and firm-years. However, because the U.S. statutory tax rate is one of the highest in the world for the majority of my sample period, I expect that income shifted out of the U.S. generates tax savings and is subsequently valued higher than income shifted into the U.S.

3.2.3 Hypotheses H2a-h: The Role of Investor Sophistication in the Valuation of Economic Earnings Components

Investor differences may drive the valuation of domestic and foreign economic earnings components. Except for Callen et al. (2005), the financial accounting literature examining the valuation of domestic and foreign reported earnings components does not test the effect of investor sophistication on valuation. This literature largely assumes limited investor sophistication, as they seek to inform policymakers and regulators by showing investors' reliance on disclosed values (e.g., Boatsman et al., 1993; Hope et al., 2008, 2009; Thomas, 2000). Conversely, the tax accounting literature implicitly assumes that investors are sufficiently sophisticated to estimate and value unrecognized and undisclosed foreign tax amounts (e.g., PRE and its deferred tax liability, tax-induced foreign cash holdings, and trapped cash) (Bauman & Shaw, 2008; Bryant-Kutcher et al., 2008; Campbell et al., 2014; Harford et al., 2017; Laplante & Nesbitt, 2017). Except for Campbell et al. (2014), these studies do not explicitly test the role of investor sophistication in valuing foreign earnings components. Therefore, I explicitly test differences in the valuation of economic earnings components and income shifted components depending on levels of investor sophistication.

I expect that the value-relevance of each of the economic earnings and shifted earnings components depends on the level of investor sophistication. Sophisticated investors have the ability, experience, and resources to value earnings better than less sophisticated investors

(Bonner & Walker, 1994; Bonner, Walther, & Young, 2003). Callen et al. (2005) find that less sophisticated institutional investors are associated with a relatively higher valuation of domestic earnings to foreign earnings than more sophisticated institutional investors. Although more sophisticated institutional investors are also associated with a relatively higher valuation of domestic to foreign earnings, more sophisticated investors are associated with a higher valuation of foreign earnings than less sophisticated investors. Campbell et al. (2014) provide evidence that higher levels of institutional ownership are associated with discounting excess foreign cash. Collectively, these results suggest that unsophisticated investors rely on reported values while sophisticated investors are able to unravel and value underlying economic earnings and tax-motivated income shifting reflected in the reported numbers.

I test the valuation of domestic and foreign economic earnings presented in Equation (3.25) and income shifted components in Equation (3.26) for different levels of institutional investment. I expect that the valuations of economic and shifted earnings components are not significantly different from zero for lower levels of investor sophistication. Moreover, I expect that higher levels of investor sophistication are associated with non-zero valuations of these components. Since the literature presents the possibilities of positive and negative valuations, I predict that valuations by the more sophisticated investor group are significantly different than the valuations I expect for the less sophisticated investor group. I state hypotheses for the individual tests as follows:

> H2a: The relation between domestic economic earnings and firm value is significantly different for higher levels of institutional investment relative to lower levels of institutional investment.

H2b: The relation between foreign economic earnings and firm value is significantly different for higher levels of institutional investment relative to lower levels of institutional investment.

H2c: The relation between domestic economic earnings shifted out of the U.S. and firm value is significantly different for higher levels of institutional investment relative to lower levels of institutional investment.

H2d: The relation between foreign economic earnings shifted out of the U.S. and firm value is significantly different for higher levels of institutional investment relative to lower levels of institutional investment.

Moreover, analysts as information intermediaries may also contribute to the recognition and valuation of economic earnings and tax-motivated income shifting. Analysts' information gathering goes beyond information provided by firms publicly (see Brown, Richardson, & Schwager, 1987; Kross, Ro, & Schroeder, 1990); as a result, analysts may incorporate information about economic earnings and tax-motivated income shifting in their forecasts. Therefore, I expect that the larger presence of analysts, and subsequently information produced by analysts, better informs the market and leads to the recognition of underlying economic and shifted earnings components.

Similar to testing valuation differences for the larger presence of institutional investors, in a second series of tests, I test whether the larger presence of analysts affects the valuation of the economic earnings and shifted earnings components. While the institutional ownership tests distinguish between more and less sophisticated investors, testing differences in analyst coverage distinguishes between firms having more and less analyst following, and consequently, poorer or

richer information environments. I state hypotheses for the individual tests of earnings components presented in Equations (3.25) and (3.26) as follows:

H2e: The relation between domestic economic earnings and firm value is significantly different for higher levels of analyst coverage relative to lower levels of analyst coverage.

H2f: The relation between foreign economic earnings and firm value is significantly different for higher levels of analyst coverage relative to lower levels of analyst coverage.

H2g: The relation between domestic economic earnings shifted out of the U.S. and firm value is significantly different for higher levels of analyst coverage relative to lower levels of analyst coverage.

H2h: The relation between foreign economic earnings shifted out of the U.S. and firm value is significantly different for higher levels of analyst coverage relative to lower levels of analyst coverage.

Alternately, the literature on the valuation of foreign and tax earnings components provides arguments to support the null hypothesis that economic and shifted components are not valued differently where there are more sophisticated investors or more information. While the financial accounting literature argues that foreign information is complex to estimate (e.g., Boatsman et al., 1993; Bodnar & Weintrop, 1997), the tax accounting literature presents the complexity of foreign taxation (e.g., Collins et al., 2001; Oler et al., 2007). Additionally, studies on international tax planning present that U.S. MNCs set up complex organizational structures to obfuscate tax planning and benefit from different tax regimes (e.g., Collins & Shackelford, 1997; Desai & Dharmapala, 2006; Desai & Dharmapala, 2009). These complex organizational structures obscure information that institutional investors or analysts use to estimate jurisdiction-specific economic earnings or tax-motivated income shifting. Thus, sophisticated investors and

analysts may find foreign jurisdiction-specific economic earnings and tax-motivated income shifting complex to estimate, and these specific components may not be associated with returns. Therefore, these arguments support the null hypotheses H2a-h.

4. Research Design

4.1 Introduction

In this chapter, I describe the research design I use to test the hypotheses presented in this study. I begin by describing the empirical model and the measurement of proxies used in this study, followed by the tests of hypotheses. I then detail the procedure I use to estimate economic earnings. Finally, I present the sample selection procedure and criteria for the various samples used in this study, along with a description of the samples' characteristics.

4.2 Empirical Model

This study tests the value-relevance of domestic economic earnings, foreign economic earnings, and a residual earnings component, which captures income shifting. I adapt the model used to test the valuation of foreign earnings components in different accounting literature streams (e.g., Bryant-Kutcher et al., 2008; Christophe 2002; Hope & Kang, 2005; Oler et al., 2007). The original model introduced by Bodnar and Weintrop (1997) decomposes the unexpected component of total earnings in the returns-earnings relation, introduced by Ball and Brown (1968), into unexpected changes in two components: domestic earnings and foreign earnings. As presented in Chapter 3, to test the value-relevance of economic earnings and income shifted, I create two decompositions of total earnings: (i) into domestic and foreign economic earnings and (ii) into economic earnings components that are shifted and that remain, for both domestic and foreign jurisdictions. The significance of the earnings response coefficients on each of the earnings components, with each model, indicates their respective value-relevance.

Following Bodnar and Weintrop (1997), I use a long window returns regression to measure the association between unexpected earnings components and abnormal returns. Subsequent studies on foreign earnings valuation use this long-run returns test, those examining

Rule 4-08(h) domestic and foreign earnings (e.g., Christophe, 2002; Hope & Kang, 2005) and geographic segment information (e.g., Boatsman et al., 2003; Bodnar et al., 2003; Christophe & Pfeiffer, 2002; Hope et al., 2008, 2009; Thomas, 2000). Additionally, studies in the tax accounting literature examining the valuation of tax-related foreign earnings components also adopt Bodnar and Weintrop's long-window returns design (e.g., Bauman & Shaw, 2008; Campbell et al., 2014; Oler et al., 2007). A long window returns test is appropriate to examine the valuation of domestic and foreign earnings components because limited information about jurisdiction-specific earnings is provided in the 10-K. Studies show that investors estimate foreign earnings values despite limited disclosure (e.g., Bauman & Shaw, 2008; Campbell et al., 2014) and assume that investors incorporate information from other sources such as management forecasts, news, analysts, and other research resources. A long window association test captures changes in price arising from various information sources released at various points in time. Therefore, I use a long-run association test, which is the standard design employed by both literature streams I use to motivate my research question.

Following the literature, which consistently relies on returns regressions to test the value-relevance of foreign earnings and its components, I use a returns regression to examine the relationship between the firm's market value of equity and earnings. Returns regressions are used in studies examining the value-relevance of foreign earnings reported under Rule 4-08(h) (e.g., Christophe, 2002; Hope & Kang, 2005), studies examining the value-relevance of foreign assets and sales reported in geographic segment disclosures (e.g., Hope et al., 2008, 2009; Thomas 2000) and studies examining the valuation of unrecognized deferred tax liability (e.g., Bauman & Shaw, 2008; Oler et al., 2007) and foreign cash (e.g., Campbell et al., 2014; Chen, 2015). The changes specification is preferred over a levels specification because it has a few advantages

over a levels specification and is modified to overcome a shortcoming. First, an omitted variable in levels specifications is an earnings component that contains information about future earnings (Kothari & Zimmerman, 1995). Changes specifications incorporate changes between current and future earnings. Second, size-driven earnings variables can be scaled by price in changes models (see Christie 1987). Further, a criticism of changes specification is that the slope coefficients are downward biased compared to levels specifications (Kothari & Sloan, 1992). Kothari and Sloan (1992) attribute this bias to the time it takes for information to be incorporated into returns versus the time it takes to be incorporated into earnings. To mitigate this bias, Kothari and Sloan propose including a leading time period to measure abnormal returns, which Bodnar and Weintrop use. Therefore, this study uses a changes specification that has been broadly relied on in the literature.

To demonstrate the reliability of results for my sample and time period, I first test the coefficients on the original returns-earnings model by Bodnar and Weintrop:

$$CAR_{i,t} = \alpha_o + \alpha_1 \Delta TEPS/P_{i,t} + \varepsilon_{i,t} \quad (4.1)$$

$$CAR_{i,t} = \beta_o + \beta_1 \Delta DEPS/P_{i,t} + \beta_2 \Delta FEPS/P_{i,t} + \varepsilon_{i,t} \quad (4.2)$$

where:

$CAR_{i,t}$ is the annual change in a firm *i*'s cumulative abnormal return, calculated using a market model, over a 12-month period: 9 months prior to the end of year *t* and 3 months after the beginning of the year *t+1*;

$\Delta TEPS/P_{i,t}$ is the change in total earnings per share (epspx) from fiscal year *t*-1 to fiscal year *t*, scaled by price at the end of the first quarter of fiscal year *t-1*;

$\Delta DEPS/P_{i,t}$ is firm *i*'s annual change in domestic reported earnings per share scaled by price at the end of the first quarter of fiscal year *t-1*. Domestic earnings per share is the difference

between pre-tax domestic income (pidom) and domestic income taxes (txt - txfor), scaled by common shares outstanding (cshpri);

$\Delta FEPS/P_{i,t}$ is firm *i*'s annual change in foreign reported earnings per share scaled by price at the end of the first quarter of fiscal year *t-1*. Foreign earnings per share is the difference between pre-tax foreign income (pifo) and foreign income taxes (txfor), scaled by common shares outstanding (cshpri);

α_o and β_o represent the constants and $\varepsilon_{i,t}$ is the error term.

Next, using the model developed in Chapter 3 (Equation (3.25)), I use the following empirical model to test the value-relevance of domestic and foreign economic earnings components:

$$CAR_{i,t} = \gamma_o + \gamma_1 \Delta DEEPS/P_{i,t} + \gamma_2 \Delta FEEPS/P_{i,t} + \varepsilon_{i,t} \quad (4.3)$$

where:

$\Delta DEEPS/P_{i,t}$ is firm *i*'s annual change in domestic economic earnings per share scaled by price at the end of the first quarter of fiscal year *t-1*. Domestic economic earnings is estimated using the procedure described in the following section, Section 4.3, and is scaled by common shares outstanding (cshpri) to get per share values;

$\Delta FEEPS/P_{i,t}$ is firm *i*'s annual change in foreign economic earnings per share scaled by price at the end of the first quarter of fiscal year *t-1*. Foreign economic earnings is estimated using the procedure described in the following section, Section 4.3, and is scaled by common shares outstanding (cshpri) to get per share values;

γ_o is the constant and $\varepsilon_{i,t}$ is the error term.

Using the model developed in Chapter 3 (Equation (3.26)), I use the following empirical model to test the value-relevance of income shifted out of and into the domestic jurisdiction:

$$CAR_{i,t} = \delta_o + \delta_1 \Delta DEcon\_Stay_{i,t} + \delta_2 \Delta DShiftOut_{i,t} +$$

$$\delta_3 \Delta FEcon\_Stay_{i,t} + \delta_4 \Delta FShiftOut_{i,t} + \varepsilon_{i,t} \quad (4.4)$$

where:

Δ*DEcon_Res* is the annual change in the portion of firm *i*'s domestic economic earnings that remain in the domestic jurisdiction, calculated per share, and scaled by price at the end of the first quarter of fiscal year *t-1*;

Δ*DShiftOut* is the annual change in the portion of firm *i*'s domestic economic earnings that are shifted out of the domestic jurisdiction, calculated per share, and scaled by price at the end of the first quarter of fiscal year *t-1*;

Δ*FEcon_Res* is the annual change in the portion of firm *i*'s foreign economic earnings that remain in the foreign jurisdiction, calculated per share, and scaled by price at the end of the first quarter of fiscal year *t-1*;

ΔFShiftOut is the annual change in the portion of firm *i*'s foreign economic earnings per that are shifted into the domestic jurisdiction, calculated per share, and scaled by price at the end of the first quarter of fiscal year *t-1*;

δ_o is the constant and $\varepsilon_{i,t}$ is the error term.

Domestic and foreign economic earnings that remain in their respective jurisdictions are calculated as the difference between the jurisdiction's economic earnings, and economic earnings shifted out of the jurisdiction. Chapter 3 details the calculation of the components of income shifted.

4.3 Tests of Hypotheses

4.3.1 Tests of Hypotheses H1a-d

Hypotheses H1a-d each predict the value-relevance of each of the domestic economic earnings, foreign economic earnings, and the income shifting proxies. I test the value-relevance of these components using the regression models presented in Equations (4.3) and (4.4) above. Following the valuation test designed by Bodnar and Weintrop (1997) and adopted by following studies (e.g., Christophe, 2002; Hope & Kang, 2005; Thomas, 2000), an earnings component is value-relevant if its coefficient in the valuation model is significantly different from zero. Therefore, to test the value-relevance of domestic economic earnings, hypothesized in H1a, I expect that the coefficient γ_1 on domestic economic earnings, $\Delta DEEPS/P$, in Equation (4.3), is non-zero. Similarly, the value-relevance of foreign economic earnings, hypothesized in H1b, is indicated by a non-zero coefficient, γ_2, on foreign economic earnings, $\Delta FEEPS/P$, in Equation (4.3). The value-relevance of the income shifting earnings components, hypothesized in H1c and H1d, is indicated by a significant non-zero coefficient δ_2 on $\Delta DShiftOut$ and δ_4 on $\Delta FShiftOut$ in Equation (4.4).

Aside from the predictions in the hypotheses, I also discuss expectations for the relative valuation of the various earnings components in Section 2 of Chapter 3. I make two comparisons within equations. I compare the relative valuations of (i) foreign and domestic earnings components, and (ii) the resident and shifted domestic and foreign earnings components.

First, I expect the domestic earnings components to be valued differently than the foreign earnings components. To examine this relative valuation, I use F-tests to test the differences in coefficients between domestic and foreign reported components (Equation (4.2)), economic components (Equation (4.3)), and shifted and resident components (Equation (4.4)). These tests

of differences extend initial results of the relative valuations of domestic and foreign components (e.g., Bodnar & Weintrop, 1997; Christophe, 2002).

In a similar vein, I test the valuation coefficients between the underlying shifted and resident components. Testing differences between the four components provides insight into whether economic or tax reasons drive their valuation. For instance, if domestic resident earnings and domestic shifted earnings are valued similarly, I attribute it to common economics. If domestic shifted earnings is valued similarly to foreign resident earnings, with which it shares common reporting properties but different economics, I infer that jurisdictional differences in taxation drive the valuation.

4.3.2 Tests of Hypotheses H2a-h: Tests of Valuation Differences by Differences in Investor Sophistication

Motivated by evidence that investors are able to value complex unreported amounts (e.g., Collins et al., 2001; Oler et al., 2007) and a gap in the literature testing investor differences in valuing domestic and foreign reported earnings, I test whether the valuations of the economic and shifted earnings components vary by investor sophistication. I measure investor sophistication for a given firm-year using two proxies: (i) the number of 13-F institutions holding shares in the firm and (ii) the number of analysts following a firm.

The institutional ownership proxy does not perfectly capture investor sophistication; therefore, I supplement it with the analyst coverage measure. Conceptually, sophisticated investors include institutions as well as knowledgeable individuals. Alternately, institutions also encompass unsophisticated investors such as index funds. However, using the number of institutional investors as a proxy for investor sophistication excludes sophisticated individuals. I assume that the effect of sophisticated individuals is not significant in comparison to the effect of

institutions. A drawback of this measurement is that the effect of sophisticated and unsophisticated individuals is captured collectively by non-institutional investors. To overcome this drawback, I additionally measure investor sophistication in valuing unobserved components using the presence of analysts as information intermediaries. I assume that analyst information would be available to institutions as well as sophisticated and unsophisticated investors. Analyst coverage, therefore, proxies for the firm's information environment and does not distinguish between types of investors. However, the two measures are similar as higher values are associated with investors having greater knowledge and abilities to decipher underlying earnings components, and lower values are associated with investor groups having less information and fewer resources.

I test the differences in valuation between groups using an interaction term in the regression model. Another method to test differences between groups is testing the two groups separately as two sub-samples. Sub-sample tests show coefficients for the high and low groups, while the interaction model requires calculating the slope and intercept for the high group from the main and interaction terms. However, testing the differences between groups as two sub-samples might affect the coefficients in the separate regressions as the separate regressions do not control for multicollinearity between groups. Therefore, I test the differences between groups using an interaction term in a single regression model, which controls for the effect of each group on the valuation coefficients of the other.

The interaction term is an indicator capturing whether the investor sophistication measure is in the top or bottom tercile. I use top and bottom terciles to measure higher and lower levels of investor sophistication rather than a median split to provide a more powerful test between the two groups.

I test hypotheses H2a and H2b, which predict valuation differences in domestic economic earnings and foreign economic earnings, respectively, for higher versus lower number of institutional investors, using the following regression:

$$CAR_{i,t} = \theta_o + \theta_1 \Delta DEEPS/P_{i,t} + \theta_2 \Delta FEEPS/P_{i,t} + \theta_3 High\_IIHoldings_{i,t} + \theta_4 \Delta DEEPS/P\ X\ High\_IIHoldings_{i,t} + \theta_5 \Delta FEEPS/P\ X\ High\_IIHoldings_{i,t} + \varepsilon_{i,t} \quad (4.5)$$

where

$High\_IIHoldings_{i,t}$ is an indicator variable with value 1 if the number of 13-F institutional investors for firm *i* in fiscal year *t* is in the top tercile, and 0 if the number of institutional investors is in the bottom tercile;

θ_o is the constant and $\varepsilon_{i,t}$ is the error term.

The coefficient θ_4 on the interaction term $\Delta DEEPS/P\ X\ High\_IIHoldings$ is the difference in the valuation coefficients of domestic economic earnings between higher and lower institutional investors groups. Similarly, the valuation coefficient θ_5 on the interaction term $\Delta FEEPS/P\ X\ High\_IIHoldings$ is the difference in the valuation coefficients of foreign economic earnings between higher and lower institutional investors groups. A significant coefficient on these interaction terms indicates that more institutional investors are associated with significantly different valuations of the earnings components than fewer institutional investors. Therefore, I interpret a significant coefficient θ_4 as support for H2a and a significant coefficient θ_5 as support for H2b.

Hypotheses H2c and H2d predict that the domestic and foreign shifted earnings components, respectively, are valued significantly differently by higher versus lower levels of institutional ownership. I use the following regression to test these hypotheses:

$$CAR_{i,t} = \mu_o + \mu_1 \Delta DEcon\_Stay_{i,t} + \mu_2 \Delta DShiftOut_{i,t} + \mu_3 \Delta FEcon\_Stay_{i,t} + \mu_4 \Delta FShiftOut_{i,t} + \mu_3 High\_IIHoldings_{i,t} + \mu_4 \Delta DEcon\_Stay\ X\ High\_IIHoldings_{i,t} + \mu_5 \Delta DShiftOut\ X\ High\_IIHoldings_{i,t} + \mu_6 \Delta FEcon\_Stay\ X\ High\_IIHoldings_{i,t} + \mu_7 \Delta FShiftOut\ X\ High\_IIHoldings_{i,t} + + \varepsilon_{i,t} \quad (4.6)$$

The coefficient μ_5 on the interaction term $\Delta DShiftOut\ X\ High\_IIHoldings$ is the difference in the valuation of domestic shifted earnings between the higher and lower institutional investors groups. Similarly, the coefficient μ_7 on the interaction term $\Delta FShiftOut\ X\ High\_IIHoldings$ is the difference in valuation of foreign shifted earnings between higher and lower institutional investors groups. A significant coefficient on these interaction terms indicates that more institutional investors are associated with significantly different valuations of these components than fewer institutional investors. Therefore, I interpret a significant coefficient μ_5 as support for H2c and a significant coefficient μ_7 as support for H2d.

Hypotheses H2e and H2f predict that domestic economic earnings and foreign economic earnings, respectively, are valued differently for different levels of analyst coverage. I test these hypotheses using the following regression:

$$CAR_{i,t} = \rho_o + \gamma_1 \Delta DEEPS/P_{i,t} + \rho_2 \Delta FEEPS/P_{i,t} + \rho_3 High\_ACoverage_{i,t} + \rho_4 \Delta DEEPS/P\ X\ High\_ACoverage_{i,t} + \rho_5 \Delta FEEPS/P\ X\ High\_ACoverage_{i,t} + \varepsilon_{i,t} \quad (4.7)$$

where

$High\_ACoverage_{i,t}$ is an indicator variable with value 1 if the number of analysts following a firm *i* in fiscal year *t* is in the top tercile, and 0 if the number of analysts is in the bottom tercile; ρ_o is the constant and $\varepsilon_{i,t}$ is the error term.

I test the difference in valuation of domestic economic earnings between higher and lower analyst coverage groups using the coefficient ρ_4 on the interaction term $\Delta DEEPS/$

$P\ X\ High\_IIHoldings$. Similarly, the valuation difference between higher and lower analyst coverage groups for foreign economic earnings is provided by the coefficient ρ_5 on the interaction term $\Delta FEEPS/P\ X\ High\_IIHoldings$. Similar to the institutional ownership tests, I interpret a significant coefficient ρ_4 as support for H2e and a significant coefficient ρ_5 as support for H2f.

Hypotheses H2g and H2h predict that domestic shifted and foreign shifted earnings, respectively, are valued significantly differently by the group having higher analyst coverage than the group having lower analyst coverage. I use the following regression model to test hypotheses H2g-h:

$$CAR_{i,t} = \sigma_o + \sigma_1 \Delta DEcon\_Stay_{i,t} + \sigma_2 \Delta DShiftOut_{i,t} + \sigma_3 \Delta FEcon\_Stay_{i,t} + \sigma_4 \Delta FShiftOut_{i,t} + \sigma_3 High\_ACoverage_{i,t} + \sigma_4 \Delta DEcon\_Stay\ X\ High\_ACoverage_{i,t} + \sigma_5 \Delta DShiftOut\ X\ High\_ACoverage_{i,t} + \sigma_6 \Delta FEcon\_Stay\ X\ High\_ACoverage_{i,t} + \sigma_7 \Delta FShiftOut\ X\ High\_ACoverage_{i,t} + \varepsilon_{i,t} \quad (4.8)$$

Similar to the institutional ownership tests, the coefficients on the interaction terms provide a test of differences between groups. A significant coefficient μ_5 on $\Delta DShiftOut\ X\ High\_IIHoldings$ provides support for hypothesis H2g and a significant coefficient μ_6 on $\Delta FShiftOut\ X\ High\_IIHoldings$ provides support for hypothesis H2h.

4.4 Estimating Domestic and Foreign Economic Earnings

This section describes how I measure domestic and foreign economic earnings, which are not observable or reported by firms. U.S. MNCs report consolidated earnings and disaggregate earnings by domestic and foreign jurisdictions following requirements in SEC Regulation 210.4-08(h) – General Notes to the Financial Statements – Income Tax Expense. Although Rule 4-08(h) provides broad domestic and foreign classifications, geographic segment reporting under

ASC 280-10-50 provides an additional source of information on firms' asset locations and customer revenue locations. I expect that investors infer earnings for more specific jurisdictions than "domestic" and "foreign" with the help of information in geographic segment disclosures. I also expect that investors use other publicly available information to estimate undisclosed economic earnings in these locations. Some sources of this information include country-specific information such as GDP, population, education levels, political stability, economic indices, and qualitative information in news reports, conference calls, and earnings of other firms operating in these regions. For this study, I rely on publicly available information in the financial statements of two samples of firms: the main sample of U.S. MNCs for which I estimate economic earnings and a sample of domestic-only firms, which operate in a single country and therefore report domestic-only economic earnings. I also include country, industry, and year fixed effects to capture other sources of information.

I first estimate U.S. MNCs' economic earnings by country since I expect that country-specific factors affect firms' earning potential in a country. I then aggregate country-level earnings to calculate foreign jurisdiction economic earnings. I outline this process in Section 4.4.2 below. I estimate economic earnings for U.S. MNCs' subsidiaries using a sample of domestic-only firms in that country. I assume that firms in a given country, within a specific industry, and in a given year, perform similarly. Further, I assume that subsidiaries of U.S. MNCs and domestic-only firms in a given country face the same political environment, regulatory environment, and other economic conditions specific to their location. Additionally, neither organizational status constrains the resources, assets, or employee pool available to either type of organization. For instance, domestic-only firms are not constrained by their domestic-only status in hiring labor or sourcing assets from outside the country. Therefore, I expect that

the productivity function of a U.S. MNC's subsidiary is, on average, the same as the productivity function of domestic-only firms operating in the same country.

I use a sample of domestic-only firms across 81 countries to estimate domestic and foreign economic earnings of a U.S. MNC. I list these countries along with their ISO country codes in Appendix A and use the ISO country codes to reference countries in the following Appendices. I estimate the country-specific location of a U.S. MNC's subsidiaries using geographic segment data and describe this process below. For each country, I compare the number of MNC subsidiaries and number of domestic-only firms, and mean and median values assets and employees between the two samples in Appendix B. To provide large sample comparisons, the observations in this Appendix are not the observations in the final regression sample.

I compare the large sample, closest to the population, of domestic-only firms to U.S. MNC subsidiaries to provide evidence on their comparability. Mean asset values are significantly different in 33 out of 81 countries: 17 at the 1% level, 7 at the 5% level, and 9 at the 10% level. Mean employee values are significantly different in 46 out of 81 countries: 27 at the 1% level, 10 at the 5% level, and 9 at the 10% level. Differences in median values of assets and employees between MNC subsidiaries and domestic-only firms are significantly different in more countries. Median asset values are significantly different in 75 of 81 countries: 72 at the 1% level and 3 at the 5% level. Median employee values are significantly different in 72 countries: 66 at the 1% level, 5 at the 5% level, and 1 at the 10% level.

Although it appears that the two samples are dissimilar, a mean test of differences tests the one-directional hypothesis that mean values for the domestic sample are greater than mean values for the MNC subsidiary sample. In 30 out of 81 countries, mean asset values are

significantly greater for domestic-only firms than MNC subsidiaries. In 13 out of 81 countries, mean asset values are significantly smaller for domestic-only firms than MNC subsidiaries. Mean differences in employee values are more balanced between domestic-only firms and MNC subsidiaries. Compared to U.S. MNC subsidiaries, domestic-only firms have higher means for the number of employees in 28 countries and lower means for the number of employees in 29 countries. Therefore, although mean values of assets and employees are significantly different between samples in approximately 41% and 57% of countries, respectively, it does not appear that U.S. MNCs are larger, on average.

4.4.1 Refining Geographic Segment Data

I use geographic segment data provided by Compustat's Historical Segments database to identify U.S. MNCs' country-specific locations. Due to database inconsistencies in the classification of geographic segments and the classification of domestic and foreign segments, I do not rely on Compustat's classification of geographic segments (stype) or its domestic/foreign identifier (geotp). Instead, I rely on the segment name (snms), reported by Compustat, to identify geographic segments and then classify these segments as domestic or foreign. I perform two major transformations on the segment data in Compustat to overcome the two inconsistencies: (i) identifying geographic segments, and (ii) matching geographic segment names to specific countries.

Since I find that the classification of geographic segments in Compustat is not consistent with the geographic segment names, I perform the following steps to identify geographic segments in the database. To identify geographic segments, among operating and business segments, I first eliminate all segments with non-geographic segment names using the geographic dictionary I create. To standardize the geographic names that appear in Compustat, I

perform a few modifications on the segment names as they appear in Compustat. Where multiple segments having the same geographic names exist for a given firm-year, I retain those with the maximum number of non-missing values of segment assets, employees, and sales. I also eliminate operating segments, apparent from segment names, that are misclassified as geographic segments in the database. This concludes the process of identifying and cleaning up geographic segment brackets for a given firm-year.

Next, I refine observations within a segment, by each segment line. For a given firm-year-segment, I eliminate observations or segment lines with negative values of assets, sales, or employees. Since the study requires data on at least one domestic and one foreign segment in a given firm-year, I eliminate firm-years that do not have data for both the U.S. (domestic) segment line and at least one foreign segment line. Finally, U.S. MNCs report a few segment names, for which I do not have the necessary data to estimate economic earnings. I exclude any countries, regions, or major cities not included in the list of 81 countries I use to estimate country-level economic earnings. Panel B of Table 1 details these steps in the sample selection procedure for Compustat's Historical Segments data.

Next, I match geographic segments with specific countries to estimate country-specific economic earnings. I describe this process in Section 4.4.2 below.

4.4.2 Six-step Procedure to Estimate Domestic and Foreign Economic Earnings

I describe the procedure I use to measure domestic and foreign economic earnings of a U.S. MNC. To summarize, I (i) identify country-specific locations of U.S. MNCs, (ii) allocate firm assets and employees across these countries, (iii) estimate U.S. MNC productivity by country, (iv) calculate domestic and foreign economic earnings proxies, (v) distribute net income over proportions of the economic earnings proxies, and finally (vi) transform economic earnings

components of net income to the regression variables presented in Equations (4.3) and (4.4) in Section 4.2.

1. ***Identifying country-specific locations.*** First, I use geographic segment disclosures mandated by SFAS 131 to identify countries where a U.S. MNC operates. Firms disclose geographic segments as broadly as a continent, for example, "Asia", less broadly as a region, "Central America", or more narrowly as a country, "Poland". U.S. MNCs disclose geographic segments broadly, as continents and regions, more frequently than as countries. To retain a reasonably large sample size and avoid selection bias, I do not restrict my sample to firms disclosing specific countries rather than broader segments. Where firms disclose broad segments, I match broad segment names with specific country names. To accomplish this, I create an algorithm that matches each broad segment name with countries that are part of the continents, regions, or countries listed in a given segment line. Instead of using a comprehensive list of all countries in a given continent or region, I only use countries covered by Compustat Global, for which I have domestic-only firm data. I present a list of these countries in Appendix A and present a detailed account of my coding of geographic segment names to match countries in Appendix C.

Two major design choices I make in assigning countries to segment names are as follows: (i) I eliminate vague geographic segment names such as "Non-U.S.", "other", or "all other foreign" to reduce noise in estimating U.S. MNC locations, and (ii) I match a broad region with all countries, for which I have the necessary data, belonging to that region. I believe this is a fair assumption as a U.S. MNC aggregates foreign earnings across all foreign countries where it operates, and countries in a given region likely share similarities in economic conditions or experience spillovers. However, assuming that a U.S. MNC operates in a wide set of countries

within a region may introduce noise into the estimation if they operate in a single or narrower set of countries. Nevertheless, since multinationals have the flexibility and resources to set up operations in various countries, I do not have a basis for ruling out, with certainty, the likelihood of operations in a given country. Therefore, in cases where a geographic segment is disclosed broadly as a continent or region, I assume that a U.S. MNC operates in all countries belonging to that continent or region. I present my regional classification of countries in Appendix D.

2. ***Allocating segment-level assets and employees across countries.*** After identifying locations where a U.S. MNC might operate, I first allocate assets and employees reported for a given segment across countries, where these values were originally reported at broader region or continent levels. Next, for all segment lines, which are now at the country-level, I calculate assets to sales and employee to sales ratios. Therefore, assets and employee values by segment are now represented as a proportion by country.

3. ***Estimating U.S. MNC country-specific productivity.*** I use a two-step procedure to estimate economic earnings for a U.S. MNC at the firm-year-country level. I assume that domestic-only firms and MNC subsidiaries operating within a country face similar constraints and benefits conferred by the country's laws and consequently have similar abilities to earn income depending on that country's resources. Therefore, I adopt a Cobb-Douglas production function to express firms' profits as a function of their capital and labor resources and assume that these profit functions are similar for domestic-only firms and U.S. MNC subsidiaries operating in similar industries in a given country and year.

The first step to calculate country-level economic earnings for a U.S. MNC is to estimate domestic-only firms' profit function. The regression equation for this profit function is as follows:

$$NI^{D}_{i,j,k,t} = \alpha_0 + \beta_1 Assets_{i,j,k,t} + \beta_2 Emp_{i,j,k,t}$$

$$+ \sum_{j=3}^{m} \beta_j CountryFE_j + \sum_{k=m+1}^{n} \beta_k IndustryFE_k + \sum_{t=n+1}^{p} \beta_t YearFE_t +$$

$$\sum_{q=p+1}^{r} \beta_q IndustryFE * Assets_{i,j,k,t} + \sum_{s=r+1}^{u} \beta_s IndustryFE * Emp_{i,j,k,t} + \varepsilon_{i,j,k,t} \quad (4.9)$$

where, for a domestic-only firm *i* belonging to industry *k* and operating in country *j* at year *t*:

$NI^{D}_{i,j,k,t}$ is net income measured as income before extraordinary items scaled by total sales;[15]

$Assets_{i,j,k,t}$ is total assets scaled by total sales;

$Emp_{i,j,k,t}$ is the number of employees scaled by total sales;

$CountryFE_j$ represents country fixed-effects and is a categorical variable that identifies each country *j* used in the estimation;

$IndustryFE_k$ represents industry fixed-effects and is a categorical variable that identifies each industry *k* used in the estimation;

$YearFE_t$ represents year fixed-effects and takes the value of each fiscal-year *t* in the sample period;

α_0 is the constant and $\varepsilon_{i,j,k,t}$ is the error term.

The model also includes interactions between industry fixed effects and (i) firm assets and (ii) the number of employees since the value of these inputs are required to generate earnings vary by industry.

In the second step, I use the same profit function to calculate country-level economic earnings of a U.S. MNC. I calculate the unknown left-hand side of the following equation, country-level economic earnings for a U.S. MNC ($EconNI^{MNC}$), by substituting on the right-hand

[15] I choose sales as a deflator as sales data is available at both firm-level and segment-level and, therefore, can be used to deflate variables at each level consistently.

side of the equation known values of country-level assets and employees, allocated based on steps (1) and (2) described above, and coefficients estimated in Equation (4.9).

$$EconNI^{MNC}_{i,j,k,t} = \widehat{\alpha_0} + \widehat{\beta_1} Assets_{i,j,k,t} + \widehat{\beta_2} Emp_{i,j,k,t}$$
$$+\widehat{\beta_j} CountryFE_j + \widehat{\beta_k} IndustryFE_k + \widehat{\beta_t} YearFE_t + \widehat{\beta_q} IndustryFE * Assets_{i,j,k,t} +$$
$$\widehat{\beta_s} IndustryFE * Emp_{i,j,k,t} \quad (4.10)$$

where, for a U.S. MNC *i* belonging to industry *k* operating in country *j* at year *t*:

$EconNI^{MNC}_{i,j,k,t}$ is country-level economic earnings multiple*;*

$Assets_{i,j,k,t}$ is country-level assets, calculated as the ratio of segment assets (ias) to segment sales (sales);

$Emp_{i,j,k,t}$ is the country-level employees, calculated as the ratio of segment employees (emps) to segment sales (sales);

$CountryFE_j$ is equal to 1, 0 otherwise, if U.S. MNC *i* operates in country *j*;

$IndustryFE_k$ is equal to 1, 0 otherwise, if U.S. MNC *i* belongs to industry *k*;

$YearFE_t$ is equal to 1, 0 otherwise, for fiscal-year *t*;

$\widehat{\alpha_0}$ and $\widehat{\beta_{1-s}}$ are estimated in Equation (4.9).

4. ***Calculating domestic and foreign economic earnings proxies.*** I aggregate country-level values of economic earnings, $EconNI^{MNC}$ in Equation (4.10), into a single collective "foreign" classification. I use broad domestic and foreign classifications for two reasons. First, my goal is to create economic earnings measures comparable with the reported earnings measures in the financial statements. I thereby follow the broad "domestic" and "foreign" classifications rather than country-specific classifications. Second, the U.S.'s worldwide tax regime naturally separates jurisdictions for U.S. multinationals into domestic and a collective "foreign" jurisdiction. Domestic income is taxed at the domestic tax rate, and foreign

income is collectively taxed at an average foreign tax rate. Therefore, I create two earnings proxies, a domestic economic earnings estimate (*EconDIEst*), for economic earnings estimated for the U.S., and a foreign economic earnings estimate (*EconFIEst*), which is the sum of economic earnings estimated for foreign countries in which I determine a U.S. MNC operates, described in step (1).

5. ***Distributing net income over proportions of economic earnings proxies.*** The economic earnings estimates at this stage are earnings proportions because of the multiplicative effect of the estimated coefficients. Therefore, I scale these proportions to the earnings level by calculating each of the two earnings multiples, domestic and foreign, as a proportion of net income reported by the U.S. MNC (NI^{MNC}).[16] I transform the domestic economic earnings proxy, *EconDIEst*, and foreign economic earnings proxy, *EconFIEst*, into domestic economic earnings, *EconDI*, and foreign economic earnings, *EconFI* as follows:

$$EconDI_{i,t} = \frac{\widehat{EconDIEst}_{i,t}}{\widehat{EconDIEst}_{i,t}+\widehat{EconFIEst}_{i,t}} \times NI_{i,t}^{MNC} \quad (4.11)$$

$$EconFI_{i,t} = \frac{\widehat{EconFIEst}_{i,t}}{\widehat{EconDIEst}_{i,t}+\widehat{EconFIEst}_{i,t}} \times NI_{i,t}^{MNC} \quad (4.12)$$

6. ***Calculating variables for the regression model.*** Finally, these values of economic earnings are calculated per share and scaled by lagged price to create variables *DEEPS/P* and *FEEPS/P* used in the valuation model (Equation (4.3)). I follow prior literature (Bodnar & Weintrop, 1997; Christophe, 2002; Hope & Kang, 2005; Hope et al., 2008, 2009) in using

[16] Bodnar and Weintrop (1997) report and discuss why total pre-tax income reported in Compustat does not equal the sum of pre-tax domestic and pre-tax foreign income. I find that for 36% of my sample, the sum of pre-tax domestic and foreign income is not equal to total pre-tax income reported. The difference is larger than $100,000 for 12.5% of the sample and larger than $1 million for 9.6% of the sample. In addition, I also modify the tax and pre-tax variables, following Dyreng and Lindsey (2009). Therefore, I calculate net income for a firm as the sum of domestic net income and foreign net income. Domestic net income is the difference between pre-tax domestic income (pidom) and domestic income taxes (txt - txfor). Foreign net income is the difference between pre-tax foreign income (pifo) and foreign income taxes (txfor).

earnings per share measures and scaling by lagged price. I discuss this measurement in Section 4.2.

4.5 Sample and Data

The population of interest to test this study's hypotheses is U.S. MNCs. I also use a sample of domestic-only firms across various countries to measure economic earnings for these U.S. MNCs. The sample period for this study spans 20 fiscal years, from 1998 to 2018, starting fiscal years beginning December 15, 1997, the first year SFAS-131 (now ASC 280-10-50) was implemented.[17] The sample selection procedure is outlined in Table 1 for each sample: U.S. MNCs (Panels A and B) and domestic-only firms (Panels C and D).

Table 1 Panel A outlines the selection procedure from the Compustat North America database, which provides firm-level data for the main sample of U.S. MNCs. I first identify U.S. MNCs among North American firms present in the sample provided by Compustat North America. I primarily identify a U.S. MNC as a firm incorporated in the U.S. and report pre-tax foreign income. I supplement the identification of U.S. MNCs with the method used in Dyreng and Lindsey (2009). To avoid losing a portion of the sample with missing values of pre-tax domestic and foreign income and domestic and foreign income taxes, I populate missing values following the process described in Dyreng and Lindsey (2009). Next, I classify U.S. MNCs as firms with non-missing values of either pre-tax foreign income or foreign taxes over their period in the dataset. For this sample of U.S. MNCs, I drop observations with zero, missing, or negative sales or total assets. I use this initial sample of firms to create a sample with the necessary geographic segment data.

[17] I re-examine samples excluding fiscal years ending (i) 2018 and (ii) 2017 and 2018 because of The Tax Cuts and Jobs Act of 2017, which affects the U.S. corporate tax rate, and the financial crisis of 2018. I find that the results of the tests of Hypotheses H1a-d and H2a-h, presented in Tables 9-14, are robust to excluding these fiscal years.

Table 1 Panel B lists the selection criteria that I apply to geographic segment data available in Compustat's Historical Segments database. I describe this procedure in Section 4.4.1. I merge firm-years that have the geographic segment data needed to calculate domestic and foreign economic earnings with the firm-level sample of U.S. MNCs. Of 63,506 observations across 5,946 firms, I lose 4,232 firms (53,924 observations) having insufficient data to calculate the final domestic and foreign economic earnings per share variables (*DEEPS/P*, *FEEPS/P*) and the income shifting measures (*DShiftOut*, *FShiftOut*). The sample of U.S. MNCs with economic earnings and income shifting data is 9,582 observations across 1,714 firms.

Next, I remove observations with missing data to calculate the regression variables. I first remove firm-years with missing data in CRSP needed to calculate cumulative abnormal returns (*CAR*). Following the event study procedure by MacKinlay (1997), I require firms to have a minimum of 60 days' abnormal returns data to calculate annual cumulative abnormal returns. Observations with missing values for the annual cumulative abnormal returns variable (*CAR*), primarily due to missing data on daily raw returns or an insufficient number of daily abnormal returns, are excluded from the sample. Next, I remove 52 observations with missing employee data. I further restrict my sample to include firms with similar incentives and abilities to shift income across borders. Operationally, this means excluding (i) firms in the utilities and financial sectors (Fama-French industry codes 31, 44, 45, and 46) and (ii) firm-years where assets or market value is less than 10 million USD.

Finally, I follow the three-step outlier removal process implemented by prior studies (e.g., Bodnar & Weintrop, 1997; Christophe, 2002). For the regression variables, that is, cumulative abnormal earnings and each of the changes in earnings variables, I first visually

identify and drop outlying observations. Second, I drop outliers outside four standard deviations from the mean. Third, I calculate Cook's distance for each regression and drop outliers with large values of Cook's D. This three-step process identifies 167 outlying observations for 12 firms. Missing data to calculate annual changes in total, domestic, and foreign earnings involves 2,302 observations for 414 firms. Missing data to calculate annual changes in economic earnings and income shifting variables involves 609 observations across 122 firms. The final sample consists of 4,340 observations for 815 U.S. MNCs.

4.5.1 Sample Selection for Domestic-only Firms.

I obtain the sample of domestic-only firms from two sources: Compustat Global and Compustat North America. I present the selection procedure for each of these in Panels C and D of Table 1. Compustat Global provides data on domestic-only firms globally, excluding Canada and the U.S., for which Compustat North America provides data. I identify domestic-only firms using two criteria: (i) where a firm's country of incorporation is the country where headquarters are located and (ii) firms for which Compustat reports only a domestic source of data for Canadian and U.S. firms and only an international source of data for firms in other countries. I assume that if a firm has both domestic and international data sources, it is a multinational and not a domestic-only firm.

I start with 519,346 observations and 42,287 firms in 110 countries that match these criteria. The next step in the sample selection procedure excludes firms with zero, missing, or negative sales or assets reported in the native currency. For firms in Compustat Global, I lose 214,610 observations across 4,457 firms and 9 countries without currency exchange data to convert native currencies into USD. Next, I exclude firms in financial and utility sectors as I exclude these industries in my sample of U.S. MNCs. I also exclude countries with less than five

domestic-only firms and fewer than 60 observations as these may not be sufficient to estimate country-level earnings. These selection steps provide a sample of 185,305 observations for 29,104 firms across 79 countries.

The sample of domestic-only firms in Compustat North America starts with 166,827 observations across 20,630 firms in Canada and the U.S. Similar to the process for the countries in Compustat Global, I drop observations with missing, zero, or negative assets and sales in the native currencies. After converting native currencies to USD, I have a sample of 97,322 observations across 14,441 firms for Canada and the U.S. I also exclude financial and utility industries for these countries. The sample for Canada and the U.S. is 73,863 observations across 11,689 firms.

My final sample of domestic-only firms is 259,168 observations in 40,793 firms across 81 countries. I rely on Stata's robust regression's in-built function that removes outliers by calculating Cook's distance and omit observations that do not fit the regression matrix.

4.5.2 Sample Descriptives

Table 2 provides a breakdown of the sample of U.S. MNCs by the Fama-French 48 industry classification in Panel A. The largest industry comprising 16.41% of the sample is Business Services. The next largest industries, comprising over 5% each in the sample, are Electronic Equipment (8.41%) and Machinery (5.67%). Each of the following six industries makes up between 4-5% of the sample: Measuring and Control Equipment, Wholesale, Pharmaceutical Products, Petroleum and Natural Gas, Chemical, and Medical Equipment. All other industries have individual compositions between 0.02-2.88%.[18]

[18] The results of this study's hypotheses presented in Tables 9-14 are robust to excluding industries with fewer than ten firm-year observations: Agriculture (n=1), Healthcare (n=8), Fabricated Products (n=5), and Defense (n=2).

Table 2 Panel B provides an annual breakdown of the sample by fiscal year. The fiscal year ending 1999 is the most populous of the sample having 249 observations, and 2018 is the least populated with 32 observations. Except for the first and last years in the sample (i.e., 1998 and 2018), each fiscal year has close to 200 observations. There do not appear to be any patterns that may affect inferences about changes in valuation.

Table 3 presents descriptive statistics for the sample of MNCs in Panel A. The mean (median) asset value for the sample is 8,072 million USD (806.36 million USD), and the mean (median) market value is 6,283 million USD (826 million USD). The firms in the sample employ on average 15,062 employees and a median of 2,938 employees. Sales for the sample have a mean (median) of 4,694.98 million USD (765.79 million USD). The mean (median) values of pre-tax income and net income are 354.93 million USD (34.43 million USD) and 231.72 million USD (22.67 million USD), respectively. The mean and median values of pre-tax, net, and foreign economic income are higher than the mean and median values for each pre-tax, net, and domestic economic income. Of the four shifted and resident components, the resident portion of foreign economic earnings has the highest mean, followed by domestic shifted earnings, while the medians of the foreign and domestic resident components are the highest. On average, the foreign reported components have higher means than the domestic reported components. The median values show that shifted components are smaller than resident components.

Table 3 Panels B to D successively provide descriptives for the stages of transformation of the regression variables. I first calculate earnings per share (EPS) values for earnings variables reported in Panel A by dividing each by common shares outstanding. Panel B provides descriptive statistics for the total, reported, economic, resident, and shifted components' EPS values. Next, following the literature (Bodnar & Weintrop, 1997; Christophe, 2002), I scale these

variables by price to mitigate size effects in earnings. Panel C provides descriptives for these variables after transforming them by dividing them by lagged price at the end of the first fiscal quarter. Finally, I calculate changes variables for each of the transformed variables in Panel C. Panel D provides descriptives for all changes variables used in the regressions. The sample's mean (median) CAR is -0.08 (-0.09). Mean and median EPS values for all the earnings components are positive and continue to be positive through the transformations. An exception is the mean of domestic EPS scaled by lagged price, which is negative.

Following the trend of the earnings values reported in Panel A, mean and median foreign reported and economic EPS values (Panels B, C, and D) are larger than their domestic counterparts. An exception is the relative size of the mean change in domestic reported earnings, which is larger than the mean change in foreign reported earnings (Panel D). Also, following the relative sizes of components in Panel A, the mean and median values of resident and shifted EPS (Panel B) are the largest for foreign resident earnings, followed by domestic resident earnings, domestic shifted earnings, and finally foreign resident earnings. The relative sizes also remain the same for median values of the four components scaled by price (Panel C). The relative sizes of these variables change for the mean values of the levels variables scaled by price. The largest is the domestic shifted component, followed by the domestic resident, foreign resident, and foreign shifted components. Finally, the relative sizes of the means of the changes variables differ from the levels variables reported in previous panels. Calculating EPS variables, scaling by price, and calculating changes in the variables results in the change in foreign shifted earnings being larger than the changes in domestic shifted, foreign resident, and domestic resident earnings, respectively.

Table 4 is a Pearson correlation matrix of the regression variables. Each regression variable is statistically significantly related to the other, mostly at the 1% level. The strongest correlations are between the change in total reported earnings and (a) the change in domestic reported earnings (0.822, $p < 0.01$) and (b) the change in foreign economic earnings (0.701, $p < 0.01$). The change in domestic reported earnings is also highly negatively correlated with the change in domestic shifted earnings (0.6812, $p < 0.01$), and the change in domestic shifted earnings is highly correlated with the change in foreign economic earnings (-0.6869, $p < 0.01$). However, these high correlations do not appear in the same regressions and do not introduce multicollinearity.

Most of the correlations are positive except for the correlations between (a) the change in domestic shifted earnings and most other variables and (b) the change in foreign shifted earnings and the changes in foreign reported and domestic economic earnings. Similar to the correlations between foreign shifted earnings and the components it is unrelated to, domestic shifted earnings is also negatively associated with components it is not related to, that is, the change in domestic reported earnings, the change in foreign economic earnings, and the changes in the resident portions of domestic and foreign earnings. Unlike the other components, domestic shifted earnings is also negatively associated with cumulative abnormal returns and the change in total reported earnings.

5. Validity Tests

5.1 Introduction

In this chapter, I conduct validity tests of the two new measures developed in this study: (i) the economic earnings measures and (ii) income shifting measures. Although the economic earnings measures used in the tests of hypotheses are aggregated at the domestic and foreign levels, I test whether the estimation procedure I use to estimate country-level economic earnings has internal and construct validity. Therefore, my validity check of the economic earnings measures involves testing the validity of the estimation procedure I develop (see Chapter 4 Section 4.4). Next, I test the validity of the income shifting measures created in this study by testing its association with tax avoidance and then comparing it with two existing measures of income shifting in the literature. First, I present the validity check of the economic earnings measures followed by the validity tests of the income shifting measures.

5.2 Validity Check of the Economic Earnings Measures

In this section, I test the internal and construct validities of the economic earnings measure created in this study. I develop a measure of economic earnings in each country that a U.S. MNC operates as firms' domestic and foreign reported earnings do not reflect the economic earnings of domestic and foreign jurisdictions. Currently, the literature does not provide comparable measures against which to assess the economic earnings measure created in this study. The financial accounting literature assumes that reported earnings reflect economic properties (e.g., Boatsman et al., 1993; Bodnar & Weintrop, 1997), while the tax accounting literature focuses on the portion of economic earnings that is shifted before reporting (e.g., Collins et al., 1998; Dyreng & Markle, 2016). Therefore, the literature does not provide any

similar measures to compare the economic earnings measure in this study. I work around this issue by testing the validity of my estimation procedure instead of the estimate itself.

I repeat the economic earnings estimation procedure for a sample of domestic-only firms, for which economic earnings equal reported earnings, to assess whether my estimation procedure of country-specific economic earnings produces values close to actual earnings reported by the firm. Domestic-only firms are an ideal sample because they report their economic earnings for the only country in which they operate. That is, these firms do not operate in other jurisdictions to which they can shift income. In measuring economic earnings for subsidiaries of U.S. MNCs, I assume that a U.S. MNC subsidiary in a specific country has a similar productivity function to a domestic-only firm in that country in a given year operating in the same industry. To test whether my estimation procedure assuming similar productivity levels captures locally produced earnings, I treat a sub-sample of domestic-only firms within a country as though they were U.S. MNC subsidiaries, without known country-specific earnings. I then estimate economic earnings for the domestic-only sub-sample of firms and compare the estimate to the firms' reported earnings for the country in which it operates.

However, the economic earnings estimate for the domestic-only sample is not directly comparable to reported earnings because it is a proportion of earnings created by multiplying regression coefficients with regression variates. Therefore, I test the correlation of the economic earnings measure for domestic-only firms to these firms' actual economic earnings, which they report. The estimated economic earnings measure is the sum of the products of firm characteristics and the coefficients from the first step estimation of country-level associations between earnings and firm characteristics. Firm characteristics in both estimations are scaled by

sales, so the estimated economic earnings measure is a scaled value. Therefore, I compare it to the firm's earnings scaled by sales.

I use Pearson and Spearman correlations to test the association between the estimated and actual economic earnings measures. I supplement the Pearson correlation test with a Spearman rank correlation test because (i) the two earnings measures for the randomly selected samples are not normally distributed, and (ii) the estimated economic earnings measure is an earnings proportion. Therefore, a rank comparison to actual earnings may be more appropriate.[19] The null hypothesis of the Spearman rank correlation test is that the two measures are independent.

I conduct three tests with different sub-samples of domestic-only firms that I treat as though they were U.S. MNC subsidiaries with unknown economic earnings. I randomly select domestic-only firms by country from the 81 countries used to estimate country-level economic earnings, using three different methods to verify the robustness of the results. Within each country, I randomly select (i) a single firm-year observation, (ii) five observations for any firm in any year, and (iii) a time series of observations for a given firm. These three methods alter the size of the estimation sample and change the sample by removing a time series. Using these sub-sample criteria, I intentionally limit the sub-sample for which I estimate economic earnings to not significantly decrease the estimation sample and maintain a similar sample as the sample in the main estimation. Testing whether the measures are reliable after altering the estimation sample in these ways provides evidence of the external validity of the measure.

Table 5 Panel A presents the correlation tests between the economic earnings estimate and reported earnings, for the three sets of randomly selected domestic-only firm observations, in

[19] I test the normality of the distributions for, each, actual economic earnings and estimated economic earnings in all testing samples using a Shapiro-Wilk test of normality. The hypothesis that the variables are normally distributed is rejected for both variables in each of the five tests.

Columns (1) to (3). The first sample, having a single firm-year in each country, has 81 observations. The second sample, having five random firm-years in a given country, has 405 observations. The third sample, having a time-series of firm-year observations in each of the 81 countries, has 581 observations. The Pearson correlation coefficient between the economic earnings estimate and reported earnings for the first sub-sample of firms is 0.887 and is significant at the 1% level. The Pearson correlation coefficient for the second sub-sample, having five firm-years in a given country, is also high (coef = 0.991) and statistically significant at the 1% level. The correlation between reported and economic earnings is significant at the 1% level for the first two sampling techniques but not in the third (coef = 0.054, p = 0.197).

The Spearman correlation coefficients are lower than the Pearson coefficients for the first two tests; however, the rank correlations are consistent for all three sub-samples. The Spearman test of independence of correlation coefficients shows that the economic earnings estimate and reported earnings are significantly correlated when I sample one firm-year from each country (Spearman's rho = 0.251, p = 0.024), five distinct firm-years from each country (Spearman's rho = 0.202, p = 0.000) and a time-series for a single firm in each country (Spearman's rho = 0.232, p = 0.000).

Since the third sub-sample using a time-series of firms in a given country is the largest of the three (n = 581) and consequently affects the estimation sample, I further test whether the correlation is sensitive to the size of the estimation sample. If the correlations for the time-series tests are consistently small and insignificant regardless of the size of the time-series, it would indicate that omitting a time-series for a firm from the estimation sample affects the economic earnings measure. To examine whether the insignificant correlation observed for the time-series test (Panel A Column (3)) is due to reduced sample size, I sample the time-series of a randomly

selected firm in a given country twice: (i) for a sample size that is any number less than 581, and (ii) a sample size equal to the size of the sample with five observations from each country (n = 405). Panel B of Table 1 presents correlations for these tests.

First, I choose a smaller time series of a randomly selected firm to maintain a larger estimation sample than the previous test. For the first test (Table 5 Panel B Column (4)), the random selection process yields 541 observations. The Pearson correlation between economic earnings and reported earnings is statistically significant at the 1% level. However, in the second test using an estimation sample the same size as the second selection method (n = 405), the Pearson correlation between economic earnings and reported earnings is small (0.028) and insignificant. Therefore, it does not appear that a critical size of the estimation sample or excluding a time series from the estimation sample affects the power of the correlation.

The Spearman rank correlations provide consistent results with the main test (Panel A Column (3)). The correlation coefficients are similar, 0.243 for the first sample and 0.202 for the second sample, and each of them is statistically significant at the 1% level. Therefore, the null hypothesis that the two measures are independent is rejected for both samples.

Overall, using three different methods of randomly sampling observations within a country, I find that domestic-only firms' reported earnings are significantly correlated with the economic earnings proxy created in this study. Since a rank correlation is more appropriate for testing the correlation between the proportion of economic earnings and reported earnings value, I conclude that my estimation procedure produces a measure of economic earnings correlated with reported earnings.

5.3 Validity of Income Shifting Measures

In this section, I examine the construct validity of the income shifting measure created in this study. First, I examine how my measure relates to firms' tax avoidance generally, using various measures for firms' short and long-run cash effective tax rates (ETRs). Following prior work (Chen et al., 2018; Klassen, Laplante, & Carnaghan, 2014), I use the cash effective tax rate to test the validity of income shifting measures. I use the effective tax rate based on cash tax payments rather than the GAAP ETR, which is based on the income tax expense, because current period tax payments might be more closely associated with tax-motivated income shifting for the current period. Second, I identify two measures in the literature developed to estimate income shifting for U.S. MNCs: Klassen and Laplante (2012a) and Dyreng and Markle (2016) and compare my measure to theirs by integrating my measures in their estimation models.

I select two of three primary models in the accounting literature as these were developed to estimate shifting from consolidated data reported by U.S. MNCs. One measure of income shifting introduced to the literature by Hines and Rice (1994) is based on the Cobb-Douglas production function, which estimates income shifted as the difference between actual income and income estimated from labor and capital levels. This measure has been used to estimate income shifting for European MNCs, having unconsolidated financial statements (e.g., De Simone, Klassen, & Seidman, 2017; Dharmapala & Reidel, 2013; Markle, 2016). The next measure of income shifting, used to estimate shifting for U.S. multinationals, was introduced as a single period measure by Collins et al. (1998) and further developed into a multi-period measure by Klassen and Laplante (2012a). Chen et al. (2018) adapt this measure to create a firm-specific estimate of income shifting for U.S. multinationals. The third measure, also developed for U.S. MNCs, by Dyreng and Markle (2016), estimates income shifted by matching pre-tax income to

the location where sales are generated. Since this study examines shifting for U.S. MNCs, I compare my measure to (i) the Klassen and Laplante model, including sensitivity checks for the Collins et al. and Chen et al. variations, and (ii) the Dyreng and Markle model.

Although my measure shares similarities with the two measures, it also differs from them on several dimensions. Some key elements of the income shifting measures are whether they (i) estimate shifting using consolidated or unconsolidated fundamentals, (ii) capture inbound and outbound shifting as average estimates or firm-specific estimates, (iii) calculate net transfers between the U.S. and foreign jurisdictions or separate inbound and outbound transfers, (iv) estimate income shifting as a portion of total earnings, (v) capture accounting-based or activities based income shifting, (vi) capture single or multi-period shifting, and (vii) incorporate the tax rate incentive to shift income between domestic and foreign jurisdictions. The income shifting measure in this study is developed for consolidated U.S. data. It calculates net income shifted, either into or out of the U.S., as a proportion of total earnings, for a given firm in a given year. Although I use U.S. consolidated data, I use a variant of the Cobb-Douglas model to estimate pre-shifted earnings, and therefore, my measure also shares similarities with this measure. In the following sections, I discuss similarities and differences between the income shifting measure in this study and each of the two income shifting measures in the literature.

I first present the association between my income shifting measures and tax avoidance. I describe the association test and discuss the results. I then compare my measure to the two income shifting models developed for U.S. MNCs: Klassen and Laplante (2012a) and Dyreng and Markle (2016). For each comparison, I first discuss conceptual and measurement similarities and dissimilarities between my measure and the comparison measure. Next, I present the models used to test the construct validity of my measure. I replicate the shifting parameters in each of

these studies for my sample and then discuss the results of comparing my measure to theirs. Finally, I discuss overarching inferences from the three analyses in conclusion.

5.3.1 Testing the Association with Tax Avoidance

I use the following model to test the association between the income shifting measures used in this study and cash ETRs, proxying for tax avoidance:

$$CETR_{it} = \alpha_0 + \beta_1 DShiftOut_{it} + \beta_2 FShiftOut_{it} + \beta_3 ROA_{it} + \beta_4 Lev_{it} + \beta_5 R\&D_{it} + \beta_6 NOL_{it} + \beta_7 \Delta NOL_{it} + \beta_8 PP\&E_{it} + \beta_9 INTAN_{it} + \beta_{10} EQINC_{it} + \beta_{11} SIZE_{it} + \beta_{12} BTM_{it} + \beta_{13} INV_{it} + \beta_{14} ADV_{it} + \beta_{15} CAPEX_{it} + \sum_{l=16}^{m} \beta_l IndustryFE_{it} + \sum_{n=m+1}^{o} \beta_n YearFE_{it} + \varepsilon_{it} \quad (5.1)$$

For a firm *i* in fiscal year *t*, *CETR* is the cash effective tax rate calculated as income taxes paid divided by pre-tax income less special items. *DShiftOut* is domestic income shifted out of the U.S. per share, calculated as the difference between domestic economic income and domestic reported income, divided by common shares outstanding adjusted for EPS. *DShiftOut* is zero if the difference between domestic economic and reported income is negative, that is, if income is shifted into the U.S. *FShiftOut* is foreign income shifted out of foreign jurisdictions per share, calculated as the difference between foreign economic and foreign reported income, divided by common shares outstanding adjusted for EPS. *FShiftOut* is zero if the difference between foreign economic and reported income is negative, that is, if income is shifted out of the U.S.

Control variables for this test are firm characteristics associated with cash ETRs. The control variables, including industry and year fixed effects (*IndustryFE* and *YearFE*), are similar to those included by Klassen et al. (2014) and Chen et al. (2018). *ROA* is return on assets calculated as pre-tax income less extraordinary items, scaled by lagged assets. *Lev* is long-term debt scaled by lagged assets. *R&D* is research and development expense scaled by total sales.

NOL is an indicator for net operating loss equal to 1 if tax loss carryforwards are positive and zero if tax loss carryforwards are negative or missing. Δ*NOL* is the annual change in net operating loss scaled by lagged assets. *PP&E* is property, plant, and equipment scaled by lagged assets. *INTAN* is intangible assets scaled by lagged assets. *EQINC* is equity in earnings scaled by lagged assets. *SIZE* is the natural logarithm of the market value of equity, calculated as the price at the end of fiscal year *t* multiplied by common shares outstanding. *BTM* is the book-to-market ratio calculated as common equity divided by the market value of equity. *INV* is inventory expense scaled by total sales. *ADV* is advertising expense scaled by total sales. *CAPEX* is capital expenditures scaled by total sales.

To test whether my income shifting measures are associated with tax avoidance, I expect that domestic income shifted out (*DShiftOut*) is negatively associated with cash ETRs (*CETR*) as income reported in lower-tax foreign jurisdictions lowers ETRs. On the other hand, I expect foreign income shifted out (*FShiftOut*) to be positively associated with cash ETRs as more income reported in the U.S., the high tax jurisdiction, is associated with a higher ETR. As a robustness test, I test the association of my measures with both short and long-run cash ETRs. I measure one-year, three-year (untabulated), and five-year cash ETRs. I also measure industry-adjusted cash ETRs for each of the three durations (untabulated).

Table 6 Columns (1)-(3) present results for short-run Cash ETRs, and Columns (4)-(5) present results for long-run five-year cash ETRs. I regress Cash ETRs on (i) *DShiftOut*, (ii) *FShiftOut*, and then (iii) both to test their joint association with Cash ETRs. Consistent with my expectations, I find that *DShiftOut* is significantly negatively associated with single year cash ETRs (coef = -0.012, p = 0.033), and that *FShiftOut* is not significantly associated with single year cash ETRs (coef = 0.006, p = 0.324). This indicates that income shifted out of the domestic

jurisdiction is associated with lower cash ETRs, signaling higher tax avoidance. In contrast, income shifted out of the foreign jurisdiction is unrelated to the tax avoidance proxy. This result is consistent with income shifted toward foreign jurisdictions lowering cash ETRs for a firm-year since foreign tax rates are lower than the U.S. statutory tax rate.

To control for shifting in the opposite direction, I include both measures in a single regression (Column (3)). When both measures are included in the test, the sizes of the coefficients are largely similar to including them separately, *DShiftOut* is -0.011 (p = 0.064), and *FShiftOut* is 0.004 (p = 0.482). Furthermore, the two coefficients are significantly different from each other (F = 3.84, p = 0.05). This is consistent with income shifted to the higher tax jurisdiction being differently associated with the tax avoidance than income shifted to lower-tax foreign jurisdictions.

I repeat the above tests for five-year cash ETRs and do not find significant coefficients on *DShiftOut* or *FShiftOut* (Columns (4)-(6)). I also run the test using three-year cash ETRs as the dependent variable and find that the coefficients are similar in size and significance whether the dependent variable is a three-year or five-year measure. I also find that the results are similar whether or not I adjust cash ETRs by industry for both short-run and long-run tests. I conclude that the results are consistent with my measures capturing single-year income shifting but not multi-period shifting.

5.3.2 Comparison with Klassen and Laplante (2012a)

In this section, I compare the income shifting measure created in this study to that developed by Klassen and Laplante (2012a). I begin by comparing the theoretical and measurement aspects of both measures. I then present the model used to compare my measure to

theirs, followed by replicating their estimation for my sample, and finally present the results of comparing the two measures.

5.3.2.1 Discussion of Conceptual and Measurement Similarities and Differences. My measure differs from Klassen and Laplante (2012a) in three ways:

1. I calculate firm-specific amounts for domestic income shifted out and foreign income shifted out that are components of total earnings, whereas the income shifting measure in the Klassen and Laplante model provides average estimates for the sample. As a result, unlike the Collins et al. and Klassen and Laplante models, my measure includes an adding-up constraint that calculates income shifted as a portion of total earnings.
2. Klassen and Laplante's measure incorporates the tax incentive to shift income using a firm's foreign tax rate based on the average tax rate. My measures do not incorporate the tax incentive to shift income between domestic and foreign jurisdictions. Instead, I assume that shifting between domestic and foreign jurisdictions that affects reported values is incentivized by the only jurisdiction-specific demarcation: the tax rate differential.
3. Klassen and Laplante present a multi-period measure. They assert that the incentive to shift income is stable over time and annual variation in a firm's annual foreign tax rate occurs due to accounting for the tax expense. Using this model for a single year underestimates outbound shifting (see Collins et al., 1998; Klassen & Laplante, 2012a). My measure captures income shifting in a given year and can be aggregated over a longer period to capture income shifting in the long run. However, my sample does not have the time-series data to calculate five-year aggregates because of the restrictions imposed on

segment-level data. Therefore, I test the association of my single period measure with the single-period model introduced by Collins et al. for a similar period comparison.

My measure shares the following similarities with Klassen and Laplante (2012a):

1. Both measures capture net inbound or outbound shifting depending on the tax incentive to shift income in a given year. As a result, I predict similar signs on the coefficients of my inbound and outbound measures as the signs on the Klassen and Laplante tax rate incentive variables, which capture the direction of shifting.
2. Conceptually, both measures capture accounting-based and activities based income shifting.

5.3.2.2 Comparison Model. To compare my income shifting measure to Klassen and Laplante (2012a), I add my income shifting measures to their model as follows:

$$FRoS_{it} = \beta_0 + \beta_1 RoS_{it} + \beta_2 HighFTR_{it} + \beta_3 LowFTR_{it} * FTR_{it} + \ +\beta_4 HighFTR_{it} * FTR_{it} + \beta_5 DEconOut/S_{it} + \beta_6 FEconOut/S_{it} + \sum_{l=7}^{m} \beta_l IndustryFE_{it} + \sum_{n=m+1}^{o} \beta_n YearFE_{it} + \varepsilon_{it} \quad (5.2)$$

The variables in this model are calculated following Klassen and Laplante (2012a). For a firm *i* in year *t*, *FRoS* is the five-year average foreign return on sale calculated as foreign pre-tax income divided by foreign sales. Departing from Klassen and Laplante, I use my classification of foreign sales based on segment names rather than geographic segment codes provided by Compustat because of errors I find in Compustat's classification of foreign segments.[20] I present the gradual change in coefficients from the original model for this measurement substitution and

[20] Foreign sales calculated using Compustat's indicator (geotp) does not match foreign sales calculated using the segment name provided by Compustat in 38.12% of observations in the final sample. I use and describe the process of classifying foreign segments using Compustat's segment name (snms) in the Research Design.

other design choices in Table 1 of Appendix F. *RoS* is the five-year average worldwide return on sales, calculated as pre-tax income divided by total sales. *HighFTR* is an indicator variable equal to 1 if the five-year average foreign tax rate is greater than zero, and is zero otherwise. Similarly, *LowFTR* is an indicator variable equal to 1 if the five-year average foreign tax rate value is less than zero, and is zero otherwise. *FTR* is the five-year foreign average tax rate for firm *i* in year *t* calculated as:

$$FTR_{it} = \frac{\sum_{p=0}^{4} ForTEe_{it-p}}{\sum_{p=0}^{4} ForPTI_{it-p}} - \frac{1}{5} \times \sum_{p=0}^{4} STR_{t-p} \quad (5.3)$$

where *ForTE* is foreign income taxes minus deferred foreign taxes, *ForPTI* is foreign pre-tax income, and *STR* is the U.S. statutory tax rate.

DEconOut/S and *FEconOut/S* are the income shifting measures created in this study. I do not use the variables in this study's hypotheses tests but, instead, construct a variation of the income shifting measures to fit Klassen and Laplante's (2012) income shifting model. *DEconOut/S* is the amount of income shifted from the U.S. to foreign jurisdictions, calculated as the difference between domestic economic income and domestic reported income scaled by total sales. This variable is zero if income is shifted into the U.S., that is, if the difference between domestic economic and domestic reported income is negative. Similarly, *FEconOut/S* is the amount of income shifted into the U.S. from foreign jurisdictions, calculated as the difference between foreign economic income and foreign reported income, scaled by total sales. *FEconOut/S* is set to zero if the difference between foreign economic and foreign reported income is negative, that is, where income is shifted out of the U.S. Finally, *IndustryFE* and *YearFE* represent industry and year fixed effects, respectively, and ε represents the error term.

FRoS regressed on *RoS* and industry and year fixed effects proxy for income shifting (see Collins et al., 1998). *HighFTR*, *LowFTR*FTR*, and *HighFTR*FTR* are proxies for the incentive

to shift income. Negative coefficients on each of these variables is a negative relation between foreign return on sales and the average foreign tax rate, indicating income shifting. The negative relation can be translated as follows: as a firm's average foreign tax rate decreases, more income is reported as foreign, and as the average foreign tax rate increases, less foreign income is reported. Positive coefficients indicate that implicit taxation, that is, higher tax rates associated with higher pre-tax rates of return, drives the relation between income shifted and higher foreign tax rates.

I first run the original model without my income shifting measures to observe the relation between shifting and the tax rate incentives to shift income for my sample (Table 7 Column (1)). I then regress foreign return on sales on my measures of income shifting while controlling for the worldwide return on sales and industry and year fixed effects (Table 7 Column (2)). I expect my measures of income shifting, which capture the amount of income shifted, to be significantly associated with the proxy to shift income. The signs on the coefficients depend on the direction of shifting: I expect a positive coefficient on income shifted out of the U.S. (*DEconOut/S*) and a negative coefficient on income shifted into the U.S. (*FEconOut/S*). A translation of these relations is: as more income is shifted out of the domestic jurisdiction, more income is reported as foreign. Alternately, as more income is shifted out of foreign jurisdictions, less income is reported as foreign.

Since my income shifting measures are distinct from the Klassen and Laplante measures, I incorporate them into the original model to check whether they capture any incremental difference. I control for the tax rate incentives to shift income in Column (3). Adding the tax incentives to shift income, I expect the significant coefficients on my measures to persist since they are both conceptually and operationally different than the tax rate incentive terms.

Insignificant coefficients on either the tax incentive variables (*LowFTR*FTR*, *HighFTR*FTR*) or this study's income shifting variables (*DEconOut/S*, *FEconOut/S*) would indicate the two sets of measures are similar and that one dominates the other.

Since two main differences between my measure and Klassen and Laplante (2012a) is that the Klassen and Laplante measure estimates multi-period shifting and provides average effects for the sample, I compare my measure to two variations of the model that estimate (i) single period and (ii) firm-specific shifting. I run Collins et al.' (1998) single period model to test whether my single period measures are significantly associated with single period estimates. I also run Chen et al.'s (2018) adaptation of the multi-period model incorporating firm fixed effects. I predict similar coefficients on my measures in these variations as I predict for the tests based on the Klassen and Laplante model.

5.3.2.3 Replication of Klassen and Laplante (2012a). Before I substitute my income shifting measures in Klassen and Laplante's (2012) model of income shifting, I replicate their test for my sample to check whether the effect holds for differences in my design choices and time period. Table 1 of Appendix F presents the progression of results for each departure my sample and period make from Klassen and Laplante. I first present results from the original test in Klassen and Laplante (Column (1)), followed by results for my sample period (Column (2)). I perform three changes to this sample individually (Columns (3a-3c)) and then combine them in Column (4). First, I modify this sample by filling in pre-tax domestic and foreign income amounts following the method presented in Dyreng and Lyndsey (2009) (Column (3a)). Using the sample presented in Column (2), I restrict the sample for non-missing values of foreign and domestic values following my classification (Column (3b)). I then substitute my foreign sales measure for the traditional measure (Column (3c)). I combine two of the major design changes

presented in Columns (3a) and (3c) in Column (4). Next, I substitute the NAICS industry classification used by Klassen and Laplante for the Fama-French 48 industry classification I use for my sample (Column (5)). Column (6) presents the results for my final sample.

Overall, comparing Columns (1) and (6), I find that the results have less power for my sample, which I observe stems from the small sample size. The signs on the coefficients of my sample are similar to Klassen and Laplante (2012a), but the significance levels are reduced. My sample size is 1,937 observations, much smaller than Klassen and Laplante's sample of 8,434 observations. The drop in sample size occurs in Column (3b), indicating a loss of observations due to my segment classification process. I also find that the explanatory power of the regression is extremely high for my sample, indicated by an adjusted R^2 of approximately 98% (Columns (3c)-(6)). On further examination, I find that industry and year fixed effects contribute to this high percentage as excluding them reduces the adjusted R^2 to 26.9% (Column (7)), which is lower than the adjusted R^2 of 44% for the original model (Column (1)). The following is a list of deviations in the coefficients from the original model, comparing Columns (1) and (6):

1. The coefficient on *RoS* is 0.032, smaller than the original 0.501, but similarly significant at the 1% level. The reduction in this coefficient appears to stem from the use of my foreign sales measure, seen as the drop in size from Column (2) to Column (3c).
2. The coefficient on *HighFTR* is -0.001 and significant at the 1% level. Relative to Column (1), although the coefficient is smaller for my sample period (Column (2)), the size increases with the use of my foreign sales measure (Column (3c)).
3. The coefficient on *LowFTR*FTR* is zero. The size of the coefficient is larger for my sample period as it increases from -0.11 (Column (1)) to -0.02 (Column (2)). Substituting my foreign sales measure (Column (3c)) renders the coefficient insignificant.

4. The coefficient on *HighFTR*FTR* is -0.002 and not statistically different from zero. The size of the coefficient increases progressively, from the original -0.10, with changes in my sample time period and other design changes. The significance of this coefficient is reduced for my final sample (Column (6)) after excluding observations having missing values for my regression variables and outliers.

5.3.2.4 Results of Validity Check. Table 7 presents three variations of the validity check using the income shifting model introduced by Collins et al. (1998) and developed by Klassen and Laplante (2012a). The first three Columns present tests using Klassen and Laplante's multi-period model, the next three Columns present tests using Collins et al.'s single period measure, and the last three Columns present tests using Chen et al.'s (2018) model using firm-specific estimates.

As discussed above, the coefficients on the variables capturing the incentive to shift income, *HighFTR* and *HighFTR*FTR* are negative, consistent with income shifting. In Column (2), I test the association between the foreign return on sales (*FRoS*), controlling for worldwide return on sales (*RoS*) and year and industry fixed effects, which proxies for income shifting, and my outbound (*DEconOut/S*) and inbound (*FEconOut/S*) income shifting measures. As predicted, I find that the coefficient on domestic income shifted out of the U.S. (*DEconOut/S*) is positive and significant at the 1% level (coef = 0.022), while the coefficient on foreign income shifted into the U.S. (*FEconOut/S*) is negative and significant at the 1% level (coef = -0.020). The results indicate that my measures of income shifting are significantly associated with the multi-period proxy for income shifting, absent controls for the tax rate incentive to shift.

Next, I add my measures of the amounts of income shifted to the full model of income shifting developed by Klassen and Laplante (2012a). Based on the comparison above, I expect

my measures to be distinct from the Klassen and Laplante measures and therefore expect my measures to incrementally capture firm-year-specific income shifting. However, if one set of measures subsumes the other, it would indicate that they capture similar income shifting. Controlling for firms' incentive to shift income when a firm's average foreign tax rate is low (*LowFTR*FTR*) and the incentive to shift income when a firm's average foreign tax rate is high (*HighFTR*FTR*), I expect the coefficients on my measures to be significant.

The results (Column (3)) are largely similar to that from the replication of results (Column (1)) and from regressing the proxy for income shifting on my measures alone (Column (2)). This result highlights that this study's income shifting measures are distinct from Klassen and Laplante. Specifically, this study's measures do not incorporate the foreign average tax rate. The coefficients on my income shifting measures in Column (3) are similar to those in Column (2), except for the coefficient on *FEconOut/S*, which is larger in Column (3). Therefore, this result indicates that my measures are significantly associated with the multi-period proxy for income shifting, controlling for the tax rate incentive to shift income, and reaffirms their conceptual and measurement differences with the Klassen and Laplante measure.

5.3.2.4.1 Single-period Tests. Table 7 Column (4) presents the coefficients on the original single period model introduced by Collins et al. (1998) for my sample. In these tests, the variables in model (2) are calculated using a single fiscal year instead of five-year averages. For my sample, the signs on the coefficients are the same as the original results; however, the coefficients on *RoS* and *LowFTR*FTR* are smaller than the original coefficients, and the coefficients on *HighFTR* and *HighFTR*FTR* are larger than the original coefficients. Additionally, the coefficient on *HighFTR*FTR* is insignificant compared to the 1% level in the original results.

Testing the association between my measures of income shifting on the proxy for single period income shifting alone, I find that the coefficients on *DEconOut/S* and *FEconOut/S* are significant at the 1% level (Column (5)). The coefficient on *DEconOut/S* is positive, consistent income shifting rather than implicit taxation driving the relation, and larger than the coefficient in the multi-period model (Column (2)), suggesting that larger amounts are transferred out of the U.S. in a single period relative to the long run. The coefficient on *FEconOut/S* is negative, consistent with the explanation for income shifting, but smaller than the coefficient in the multi-period model, suggesting that smaller amounts are transferred into the U.S. in a single period relative to the long run.

Next, I incorporate my measures in the single-period model (Column (6)) to test whether they capture any incremental income shifted. Controlling for the tax rate incentive to shift income in a single year does not significantly alter the results reported in Column (5). The coefficients on *DEconOut/S* and *FEconOut/S* remain significant, consistent with the fact that they measure the earnings amount of income shifting, incremental to single-period shifting. However, the coefficient on *LowFTR*FTR* has a lower significance at the 10% level, compared to the 1% level in Column (4), indicating a dampening effect by adding the firm-year specific measures to the model. Therefore, I find that my measures of income shifting are significantly associated with the single-period income shifting model, consistent with my measures capturing single-period shifting. The significance of my measures in a combined model also indicates that my measures are distinct from Collins et al.'s (1998) single-period measure.

5.3.2.4.2 Multi-period Tests with Firm-specific Estimates. Table 7 Columns (7) to (9) present results from using Chen et al.'s (2018) adaptation of the Klassen and Laplante model to include firm-specific estimates. Chen et al. do not report coefficients for this model but observe

outbound shifting trends consistent with Klassen and Laplante and inbound shifting trends consistent with Collins et al. (1998) and Klassen and Laplante. For the baseline test in my sample, presented in Column (7), I find that foreign return on sales (*FRoS*) is positively associated with the worldwide return on sales (*RoS*), controlling for firm fixed effects. The coefficient is 0.033, significant at the 1% level. It is similar to the coefficients on *RoS* for both the multi-period Klassen and Laplante model and single period Collins et al. model.

Column (8) presents the results of adding my income shifting measures to the model without controlling for firm-specific tax rates. Consistent with my predictions, the coefficient on *DEconOut/S* is positive (coef = 0.014, $p < 0.01$), indicating that more income shifted into the foreign jurisdiction is associated with higher foreign return on sales, suggesting that income shifting is associated with foreign pre-tax return. Additionally, controlling for the firm-specific tax rate (Column (9)), the coefficient is positive and significant at the 1% level, consistent with predictions for income shifting. Consistent with my expectations, the coefficient on *FEconOut/S* is -0.005 ($p<0.01$), without controlling for firm-specific tax rates, and -0.004 ($p<0.01$) controlling for firm-specific tax rate incentives to shift income. The negative coefficient indicates that income shifted out of foreign jurisdictions is associated with lower foreign pre-tax returns. The significant coefficients on my measures in this model indicate that they capture income shifting incremental to Chen et al.'s (2018) multi-period model using firm-specific average tax rates. Therefore, I conclude that, although my measures capture single period firm-specific shifting, they are significantly associated with multi-period firm-level estimates of shifting developed by Chen et al. (2018). My measures also incrementally capture information about income shifting associated with firm-year shifting or single-period information not captured by Chen et al.

5.3.3 Comparison with Dyreng and Markle (2016)

In this section, I compare the income shifting measure created in this study to the Dyreng and Markle (2016) income shifting model. I begin by comparing the theoretical and measurement aspects of both measures. I then present the model I use to compare them, replicate the outbound and inbound transfer estimates for my sample, and finally discuss the results of the comparison model.

5.3.3.1 Discussion of Conceptual and Measurement Similarities and Differences. The following is a list of differences between my measure and Dyreng and Markle's (2016):

1. Dyreng and Markle's model estimates income shifting by matching location-specific revenues and expenses to reported income for those jurisdictions, while my measure is the difference between economic earnings and reported earnings for a given jurisdiction. Although the concepts of reported income are the same in both studies, while Dyreng and Markle use pre-tax amounts to measure reported income, I use after-tax amounts because I assume that the incentive to shift is driven by the after-tax amount reported in a jurisdiction.
2. Relatedly, Dyreng and Markle's concept and measure of income earned in a jurisdiction are based on sales reported based on customer location, whereas my concept and measure of jurisdiction-specific earnings are a function of capital and labor.
3. Similar to Collins et al. (1998) and Klassen and Laplante (2012a), Dyreng and Markle provide average estimates for income shifting, whereas my measure captures firm-specific amounts.
4. Dyreng and Markle estimate separate inbound and outbound transfers for a given firm-year. They caveat that these include both tax-motivated and investment-related transfers.

However, my measure captures net inbound or outbound transfers, which I assume is based on the overall incentive to shift income between the high tax U.S. jurisdiction and the low tax foreign jurisdiction.

My measure shares the following similarities with Dyreng and Markle's (2016) measure:

1. Both measures are single-period measures.
2. Both measures include adding up constraints, such that estimates of income shifted is less than total earnings for a given firm-year.
3. Although Dyreng and Markle additionally capture both tax-motivated and other types of shifting, both measures capture accounting and activities-based income shifting.
4. Although Dyreng and Markle incorporate the tax incentive to shift income using firms' financial constraints as a proxy, I use their baseline model, which excludes the financial constraints, to check the validity of my measure. My validity check is based on the validation tests for their baseline model, where they test the incremental effects of tax havens and the five-year average foreign tax rate on their shifting parameters.

5.3.3.2 Comparison Model. Given the dissimilar measurement of the Dyreng and Markle (2016) measure and the income shifting measure in this study, discussed above, the two measures are not substitutes. Therefore, to test the construct validity of my income shifting measure, I follow Dyreng and Markle's validity test of their baseline model. Dyreng and Markle test the validity of the outbound and inbound transfer measures by adding two distinct tax avoidance measures: (i) the incidence of a tax haven, as an indicator variable, and (ii) the difference between the U.S. statutory rate and the average foreign tax rate, as a continuous measure. In a similar vein, I modify Dyreng and Markle's validity test by replacing the tax avoidance measures with this study's income shifting measure. Although the new measures are

independent variables in this validity test, the test examines the association between the Dyreng and Markle measure and the new income shifting measure in this study. Following Dyreng and Markle, the model for this test is:

$$\Delta PIDOM_{it} = \alpha_0 + (1-\gamma)\rho_f \Delta SALEFO_{it} + \theta\rho_d \Delta SALEDOM_{it} + \varepsilon_{it} \quad (5.4)$$

$$\Delta PIFO_{it} = \beta_0 + \gamma\rho_f \Delta SALEFO_{it} + (1-\theta)\rho_d \Delta SALEDOM_{it} + \mu_{it} \quad (5.5)$$

where $\theta = \theta_0 + \theta_{shift}$*ShiftingVar*

and $\gamma = \gamma_0 + \gamma_{shift}$*ShiftingVar*

For firm *i* having fiscal year-end *t*, Δ*PIDOM* is the annual change in pre-tax domestic income from year *t* -1 to year *t*. Δ*PIFO* is the annual change in pre-tax foreign income from year *t* -1 to year *t*. Δ*SALEFO* and Δ*SALEDOM* are the annual changes in foreign sales and domestic sales, respectively, from year *t*-1 to year *t*. *ShiftingVar* represents my income shifting measure. To incorporate a measure consistent with the measures in this model, I can use two variations of my measure for this test: (i) the value of income shifted, calculated as the difference between domestic reported income and domestic economic income, resulting in negative values for income shifted out of the U.S. and positive values for income shifted into the U.S. (*NetShift_Dom*), and (ii) the levels version of the variable used to test the main hypotheses (*DShiftOut*), calculated as the difference between domestic economic income and domestic reported income where positive, and zero otherwise, takes on positive values for income shifted out of the U.S. Conceptually, *NetShift_Dom* measures the amount of income shifted in either direction for a given firm-year, and *DShiftOut* captures income shifted out of the U.S. alone.

Dyreng and Markle (2016) interpret the coefficient on the tax avoidance variables in their validity tests as incremental effects to the overall outbound and inbound transfer parameters, θ_0 and γ_0. Since both of the tax avoidance variables they test are positively associated with

outbound shifting, the results are positive coefficients on the outbound transfer term and negative coefficients on the inbound transfer term. Following this rationale, I expect that the coefficient θ_{shift} on the first shifting variable *NetShift_Dom* will be negative and significant, indicating that my measure of income shifted, which is negative for outbound shifting, captures a portion of outbound transfers. I expect the coefficient γ_{shift} on *NetShift_Dom* to be positive and significant, indicating that positive values of income shifted, measuring income shifted into the U.S., are incremental to the overall measure of inbound transfers. For the second measure variation *DShiftOut*, I expect the coefficient θ_{shift} to be significant and positive, consistent with this variable capturing the outbound income shifting portion of outbound transfers. Since *DshiftOut* is zero for any income shifted into the U.S., I do not expect a significant coefficient γ_{shift} on the inbound transfer parameter.

5.3.3.3 Replication of Dyreng and Markle (2016). Before adding my measures of income shifting in Dyreng and Markle's (2016) model of income shifting, I replicate their results for my sample. Table 8 Column (1) presents their results followed by results from the replication for this study's sample in Column (2). My sample size is much smaller (n = 4,175) compared to the original sample (n = 9,385). A few differences apparent in results for my sample (Column (2)) are the smaller explanatory power of each of the simultaneous equations, the larger coefficient for outbound transfers, and smaller coefficients for inbound transfers, return on domestic and return on foreign sales variables. Dyreng and Markle interpret their transfer parameters to mean that 7.9% of domestic income shifted out of the U.S. and 41.2% of foreign income shifted into the U.S. Outbound transfers are greater than inbound transfers in my sample, with 40.2% of income shifted out of the U.S., and 30.6% of income shifted into the U.S. Additionally, the coefficient on the intercept for $\Delta PIDOM$ is smaller for my tests, while the

coefficient on the intercept for Δ*PIFO* is slightly larger than the original but significant at the 1% level. Adding my income shifting variables to the model (Columns (3) and (4)), the signs and significance levels of the main coefficients remain similar. I interpret my results as qualitatively similar to Dyreng and Markle.

5.3.3.4 Results of Validity Check. First, I test whether an earnings-level measure of my income shifting measure is related to inbound and outbound transfers in this model (Column (3)). *NetShift_Dom* captures the value of income shifted out as a proportion of total earnings and is negative for income shifted out of the U.S. and positive for income shifted into the U.S. I predict that the coefficient for outbound transfers on this variable (θ_{shift}) is negative and that the coefficient for inbound transfers on this variable (γ_{shift}) is not different from zero. However, I find that both the coefficients are statistically different from zero at the 1% level. I interpret this to mean that an increase in total outbound transfers is associated with a decrease of income shifted out of the U.S., measured by negative values in *NetShift_Dom*. I interpret the increase in inbound transfers to be associated with the increase in income shifted into the U.S., measured by positive values in *NetShift_Dom*. Therefore, I conclude that the earnings level variable of my income shifting measure, capturing net outbound or inbound shifting in a given firm-year, is inversely associated with the outbound transfers but directly proportional to the inbound transfers measured by Dyreng and Markle.

Next, I test whether the earnings per share scaled by common shares outstanding version of my measure, used in the main regression analyses, is associated with shifting captured by the Dyreng and Markle model (Column (4)). *DShiftOut* is positive for income shifted out of the U.S. and is zero otherwise. Consistent with my expectations, I find that the coefficient on the outbound transfer parameter is significant at the 1% level, indicating an association between my

outbound shifting measure and outbound transfers. However, contrary to my expectations, the coefficient is negative (coef = -0.030), indicating that total outbound transfers increase as income shifted out of the U.S. decreases. Dyreng and Markle's model captures both inbound and outbound transfers in a given firm-year, while my measure captures net outbound transfers. I interpret the negative association to mean that income shifted out of the U.S. in a given firm-year is associated with lower overall outbound transfers. This result is similar to the result for *NetShift_Dom*, which captures inbound shifting values where *DShiftOut* is zero.

Next, I observe a positive association between the inbound transfer parameter and instances of zero net outbound shifting. As predicted, the coefficient γ_{shift} on the inbound transfer parameter is positive and significant at the 1% level. Since *DShiftOut* is zero for inbound shifting, the positive association indicates that my measure of net income shifting in firm-years where no income is shifted outward is associated with Dyreng and Markle's inbound shifting measure, which captures income shifted in both directions in a given firm-year. I conclude that my net outbound income shifting measure is significantly associated with simultaneous outbound and inbound transfers, captured by the Dyreng and Markle model, but is a decreasing function of overall outbound transfers.

5.3.4 Conclusion

In this section, I examine the construct validity of my income shifting measures by first testing their association with tax avoidance and then directly comparing them to existing measures in the literature. I also discuss conceptual and measurement similarities and differences between my measure and the two measures I use for the validity tests. I find that, as expected, my single period measure of income shifted out of the U.S. is associated with short-run tax avoidance but not long-run tax avoidance, measured using firms' cash tax payments. In the

validity tests, I find that each of my inbound and outbound shifting measures are significantly associated with the multi-period Klassen and Laplante (2012a) measure, as well as the single-period variation (Collins et al., 1998) and firm-specific variation (Chen et al., 2018). Additionally, using two versions of my measure, I find that outbound shifting for a given firm-year captured by each of these measures is a decreasing function of outbound transfers measured by Dyreng and Markle (2016). I also find that inbound income shifting captured by my measure and my measure of firm-years where no inbound shifting occurs are each associated with inbound shifting estimated by Dyreng and Markle. Based on the theoretical discussion, my measures overlap with both the Klassen and Laplante measure as well as the Dyreng and Markle measure; however, my measure also differs significantly from each of them. Based on the results, I conclude that my measure is associated with both Klassen and Laplante and Dyreng and Markle but captures income shifting distinct from the two measures.

6. Results

6.1 Tests of Hypotheses H1a-d

This section presents the results from testing hypotheses H1a-d, which predict the value-relevance of the economic earnings and shifted earnings components developed in this study. First, I replicate the valuation test of domestic and foreign reported earnings introduced by Bodnar and Weintrop (1997) and followed by the foreign earnings literature (Christophe, 2002; Hope & Kang, 2005; Hope et al., 2008, 2009). Second, I test the value-relevance of domestic and foreign economic earnings measures developed in this study and hypothesized by H1a and H1b. Third, I test the value-relevance of the income shifting components created in this study and hypothesized by hypotheses H1c and H1d. In addition to the hypotheses' tests, I also test and discuss the relative valuations among the various earnings components. I also conduct analyses controlling for time-invariant industry characteristics and annual variation.

I run two specifications for each of the three tests listed above: (i) without fixed effects and (ii) year and industry fixed effects. Although both the changes regression and fixed effects ameliorate bias in coefficients due to omitted variables in the regression model, the changes specification does not address endogeneity issues related to the sample. Changes in return between years could be affected by the year or the industry. Therefore, I explicitly specify fixed effects to estimate any industry and annual trends. I control for time-invariant characteristics affecting the relation using industry fixed effects. I also control for annual shocks to valuation by controlling for year fixed effects.

For the baseline tests and tests of all four hypotheses, H1a-d, I generally find that the results are similar for the first two specifications. For each of the tests, I also consistently find that the intercept loses significance when controlling for industry-year fixed effects, indicating

insignificant abnormal returns when these factors are considered. Also common to all three tests, the regressions' adjusted R-squared increase progressively by adding industry fixed effects. For each test, I present results without specifying fixed effects as the main set of results and supplement this discussion with results from the fixed effects specification.

6.1.1 Baseline Tests of the Valuation of Domestic and Foreign Reported Earnings

Before I test this study's hypotheses, in a similar vein to studies that followed Bodnar and Weintrop (1997) (e.g., Christophe, 2002; Hope et al., 2008, Hope et al., 2009), I replicate Bodnar and Weintrop's main test of the valuation of domestic and foreign reported earnings. In addition to sampling a different period, my sample selection procedure involves significant design choices that may change base level results. In Table 1 of Appendix G, I elaborate on these specific design choices and present how the valuation coefficients change for incremental design choices differing from the original design.

In testing the valuation of the reported earnings components, I find that the valuation coefficient on the change in domestic reported earnings ($\Delta DEPS/P$), α_1, is 0.516 (p = 0.000) and the valuation coefficient on the change in foreign reported earnings ($\Delta FEPS/P$), α_2, is 0.766 (p = 0.000). The size and significance of these coefficients are similar to the coefficients reported by Bodnar and Weintrop (1997), a coefficient equal to 0.517 (p <0.01) on the change in domestic reported earnings and a coefficient equal to 1.235 (p <0.01) on the change in foreign reported earnings. Subsequent studies that replicate the original test (e.g., Christophe, 2002; Hope & Kang, 2005; Hope et al., 2008, 2009) also find similar coefficients for their different samples and periods examined. They additionally find that the coefficient on the change in foreign reported earnings is larger than the coefficient on the change in domestic reported earnings (see Appendix H Table 1).

Next, I test the difference between coefficients on the domestic and foreign reported earnings variables. Table 9 displays the results from testing the equality of coefficients within each of the specifications. I find that domestic reported earnings are valued significantly lower than foreign reported earnings at the 10% level ($F = 2.89$). I interpret this result to mean that the market views these two components as distinct. The coefficient on the change in foreign reported earnings is also significantly larger than the coefficient on the change in domestic reported earnings in the fixed effects specification ($F = 2.920$, $p = 0.088$). Therefore, the valuation of domestic reported and foreign reported earnings measured for this sample is consistent with results from prior studies.

As presented in Section 2 of the Literature Review, the financial accounting literature explains why foreign reported earnings may be valued higher than domestic reported earnings. As discussed, these studies also rule out several explanations that contribute to the differential valuation of domestic and foreign components. However, prior studies find evidence for only two reasons that affect the differential valuation of domestic and foreign reported earnings. Bodnar and Weintrop (1997) and Christophe (2002) find that foreign growth opportunities contribute to the relatively higher valuation of foreign reported earnings. Christophe (2002) also finds that agency problems between firms' shareholders and management contribute to a higher penalty by the market on negative foreign earnings changes. However, this study's premise is that reported earnings for a given jurisdiction comprise economic properties from both foreign and domestic jurisdictions due to income shifting activities. Therefore, differences in valuation attributed to jurisdiction-specific economic properties, such as jurisdiction-specific growth opportunities or jurisdiction-related agency problems, are associated with economic earnings components conceptualized in this study rather than reported earnings components.

The difference in the relative valuation of domestic and foreign reported components may be due to other factors. Based on factors described in prior literature, a reporting-related reason that may contribute to the different relative valuations of domestic and foreign reported components is the higher reliability of U.S. GAAP compared to consolidated foreign amounts (Bartov & Bodnar, 1996). Another contributing factor to the different valuations of domestic and foreign reported components is the tax rate applied at the level of reported earnings. In the following tests of hypotheses H1a-d, I disentangle whether the relative valuations of domestic and foreign earnings are attributable to their economic properties, by testing the value-relevance of economic earnings components, or to their tax-related attributes, by testing the value-relevance of domestic and foreign income shifted components.

6.1.1.1 Robustness Test Using Fixed Effects Specification. This baseline result that (a) domestic reported earnings and foreign reported earnings are each value-relevant and (b) foreign reported earnings are valued higher than domestic reported earnings is consistent for the fixed-effects specification. I interpret this to mean that industry or year characteristics do not change the value-relevance or relative valuation of the reported earnings components. Controlling for industry and year fixed effects (Column (2)) produces higher valuation coefficients than the results without fixed effects (Column (1)), suggesting that domestic and foreign reported earnings are valued more highly by the market after considering variation across industries and time. Overall, the fixed effects specification results indicate that domestic and foreign reported earnings are valued beyond industry-specific or yearly characteristics.

6.1.2 Valuation of Domestic and Foreign Economic Earnings Components

6.1.2.1 Tests of Hypotheses H1a and H1b. Hypothesis H1a predicts that domestic economic earnings are value-relevant, and hypothesis H1b predicts that foreign economic

earnings are value-relevant. Testing the value-relevance of these economic earnings components, I find that firms' annual cumulative abnormal returns (*CAR*) are positively significantly associated with the change in domestic economic earnings ($\Delta DEEPS/P$) ($\beta_1 = 0.703$, p = 0.000) and the change in foreign economic earnings ($\Delta FEEPS/P$) ($\beta_2 = 0.473$, p = 0.000). These results indicate that the market recognizes and values each economic earnings component, supporting hypotheses H1a and H1b. Supporting evidence for hypotheses H1a and H1b suggests that investors are able to estimate earnings created in a jurisdiction although earnings are not reported at this level and can recognize the value of earnings based on where they are created.

6.1.2.2 Testing the Relative Valuation of Domestic and Foreign Economic Earnings. Contrary to the relative valuation of the reported earnings components, the domestic economic earnings component is valued significantly higher than the foreign economic earnings component. An F-test of the equality of the coefficients indicates that the coefficient on the change in domestic economic earnings is significantly greater than the coefficient on the change in foreign economic earnings at the 5% level (F = 4.06). The significant difference between the two components indicates that the market recognizes the two economic earnings components as distinct from each other, in addition to recognizing the reported earnings components as distinct from each other. However, the coefficients' relative sizes reveal that domestic earnings are valued higher than foreign earnings for their economic properties but lower than foreign earnings for their reporting properties.

Since prior literature lays the theoretical foundation for economic differences in domestic and foreign earnings, I draw on the arguments presented in the literature to explain the valuation and relative valuation of the economic earnings components. The value-relevance of domestic and foreign economic earnings is a reflection of their jurisdiction's economic, political,

legislative, and other institutional properties (Bodnar & Weintrop, 1997; Christophe & Pfeiffer, 2002). Jurisdiction-specific risk and uncertainty also contribute to the valuation of that jurisdiction's earnings (Boatsman et al., 1993; Bodnar & Weintrop, 1997). Other reasons argued by the literature for the valuation of jurisdiction-specific earnings include information asymmetry due to geographic distance, affecting management of operations and investor access to information (e.g., Bodnar et al., 1997; Callen et al., 2005; Denis et al., 2002; Hope et al., 2008, 2009).

Based on these arguments, domestic economic earnings may be more highly valued because they are created in a stable and more familiar economic, political and institutional environment relative to foreign environments. Earnings created domestically are also associated with lower operational risks and lower moral hazard risk between shareholders and managers than earnings created in foreign environments, which exacerbate these risks due to geographic distance. Information theory also suggests that investors rely more on domestic information than foreign information because it provides higher returns (Huang, 2015; Van Nieuwerburgh & Veldkamp, 2009). Therefore, I infer that domestic economic earnings are valued more than foreign economic earnings due to the certainty of cash flows to shareholders free from the interference of foreign governments, the relatively lower market and internal risk of domestic operations, and higher returns associated with domestic information.

6.1.2.3 Robustness Test Using Fixed Effects Specification. Column (4) of Table 9 reports results from the fixed effects specification for the valuation of the economic earnings components. The results are similar to the main results. The domestic and foreign economic components are value-relevant, and domestic economic earnings is consistently valued higher than foreign economic earnings. Similar to the valuation of the reported earnings components,

controlling for industry and year fixed effects increases the size of the coefficients on domestic economic and foreign economic earnings, indicating precision in their valuation after controlling for noise in industry and year factors. Additionally, domestic and foreign economic earnings are also valued significantly differently, at the 1% level (F = 4.938). Therefore, I conclude that industry-year fixed effects affect the valuation of the economic earnings components.

6.1.2.5 Conclusion. As predicted, hypotheses H1a and H1b, predicting the value-relevance of the domestic and foreign economic earnings components, each, are supported. As expected, domestic and foreign economic components are valued significantly differently than each other. Although the result that domestic economic earnings is valued higher than foreign economic earnings is opposite to the result for the reported components, the literature provides theory that supports this result.

The tests also reveal that the market views the domestic and foreign economic earnings components as distinct from each other and their reported counterparts. First, the domestic and foreign economic earnings components are value-relevant. Second, their valuation characteristics are different from the reported components' as the domestic economic earnings component is valued higher than the foreign component. The value-relevance of economic earnings components and differences in valuation of reported and economic earnings components suggest a role for explicitly modeling shifted earnings components.

6.1.3 Valuation of Shifted and Resident Earnings Components

As presented in Chapter 3 – Model and Hypotheses Development, I decompose total earnings into shifted and resident components for the domestic and foreign jurisdictions. I assume that firms shift income in a single direction, either into or out of the domestic jurisdiction, because the tax incentive, measured by the differential tax rate between domestic

and foreign jurisdictions, motivates income shifting. In this model, income shifted out of the U.S. is captured by *DShiftOut,* and income shifted into the U.S. is captured by *FShiftOut*. Since income shifting happens in a single direction for a given firm-year, non-zero values of one variable are associated with a value of zero for the other. Therefore, the two variables partition the amount of income shifted by direction, and inferences about income shifted out of the domestic jurisdiction, *DShiftOut*, and income shifted out of the foreign jurisdiction, *FShiftOut*, are firm-year specific.

The earnings decomposition model that parses out domestic and foreign shifted earnings additionally allows me to measure economic earnings components that remain in their source jurisdictions. Table 10 Panel A presents results from the valuation test of the four resident and shifted components for three fixed effects specifications. The results indicate that the market values resident domestic economic earnings the highest among the four components and values the resident foreign component next. The tests of the coefficients on domestic and foreign shifted components fail to reject the null hypothesis of these components not affecting value, on average. Earnings created and reported in the domestic jurisdiction may be valued highly because of the reliability of U.S. GAAP reporting (Bartov & Bodnar, 1996) and ease of processing domestic information (Huang, 2015; Van Nieuwerburgh & Veldkamp, 2009). Foreign earnings created and reported in the foreign jurisdiction may also be valued highly due to lower foreign tax rates or foreign growth opportunities. I discuss the reasons for lower relative valuations of the shifted earnings components below, along with the results from testing the value-relevance of these components hypothesized in this study. As a feature of the decomposition model and valuation tests, I also discuss the valuation of resident economic earnings components reported in their source jurisdictions.

6.1.3.1 Tests of Hypotheses H1c and H1d. Results of the tests of hypotheses H1c and H1d are presented in Table 10. H1c predicts that the component of domestic economic earnings shifted out is value-relevant. The coefficient on the change in domestic economic earnings shifted out (Δ*DShiftOut*) is not significantly different from zero (γ_2 = -0.114, p = 0.324), indicating that the domestic shifted earnings component is not value-relevant. Since the market is able to value the economic earnings components remaining in a given jurisdiction, I infer that the valuation of domestic income shifted is not due to the market's inability to estimate the shifted component.

Failing to show the relevance of domestic shifted earnings is not consistent with a tax explanation since income shifted to the lower-tax foreign jurisdiction should be valued for the associated tax benefit. Column (1) of Table 10 Panel B shows that the domestic economic component that is shifted (Δ*DShiftOut*) is significantly different, at the 1% level, than both the resident domestic economic component (Δ*DEcon_Res*), with which it shares economic properties, and the resident foreign economic component (Δ*FEcon_Res*), with which it shares tax-reporting properties. Therefore, the value irrelevance of the domestic shifted earnings component is unlikely due to the domestic jurisdiction's economic properties or tax benefits associated with the foreign jurisdiction. Measurement error in the income shifting estimates may also bias the coefficients toward zero.

The relatively lower coefficient on domestic shifted earnings is likely associated with higher risk or lower reinvestment potential of these earnings in the foreign destination jurisdiction. Domestically created shifted earnings may face lower economic potential in foreign jurisdictions because foreign markets may be saturated and reinvestment opportunities may be limited to financial assets, which can destroy firm value due to its propensity to be trapped

abroad (see Bryant-Kutcher et al., 2008). Therefore, domestic shifted earnings may not contribute to firm value because of the lack of reinvestment potential in the foreign jurisdiction.

H1d predicts the value-relevance of the portion of foreign economic earnings shifted out. I find that the coefficient on the change in foreign economic earnings shifted out (Δ*FShiftOut*) is not significantly different from zero ($\gamma_4 = 0.398$, $p = 0.202$). As seen in Column (1) of Table 10 Panel B, this shifted component is valued significantly less than the resident foreign economic earnings component (Δ*FEcon_Res*), with which it shares economic properties, and the resident domestic economic earnings component (Δ*DEcon_Res*), with which it shares tax-reporting properties.

The significantly lower valuation of foreign shifted earnings may be associated with the lower economic potential of these shifted earnings in the domestic jurisdiction, relative to the home foreign jurisdiction, or higher tax rate in the domestic jurisdiction. Foreign economic earnings may have lower reinvestment potential in the domestic jurisdiction depending on the mechanism through which it is classified and shifted into the U.S. For instance, during the repatriation tax holiday introduced by the American Jobs Creation Act of 2004, tax exemptions were conditional on whether foreign income was repatriated as a cash dividend and met the eligibility criteria for the Dividends Received Deduction (see Oler et al., 2007). Earnings created in a foreign jurisdiction may be shifted to the U.S. through transfer pricing strategies concealed from the tax authorities and competitors, limiting the avenues for reinvestment. Subsequently, the reinvestment potential of earnings shifted to the domestic jurisdiction is decreased. Therefore, the value irrelevance of foreign economic earnings shifted out of the foreign jurisdiction is possibly due to higher taxation or lower reinvestment potential in the domestic jurisdiction.

Although not the focus of this study, the valuation tests show that the market also recognizes economic earnings components reported in their respective jurisdictions but values them similarly. Each of the two resident economic earnings components is valued positively and significantly different than zero across all three specifications (Table 10 Panel A). The coefficient on the change in resident domestic economic earnings (Δ*DEcon_Res*), γ_1, is 1.842 (p=0.000) and the coefficient on the change in resident foreign economic earnings (Δ*FEcon_Res*), γ_3, is 1.247 (p=0.000). However, the tests of differences in the coefficient on the change in domestic economic earnings remaining in the domestic jurisdiction (Δ*DEcon_Res*) and the coefficient on the change in foreign economic earnings remaining in the foreign jurisdiction (Δ*FEcon_Res*) fail to show that they are statistically different (F = 1.64, p = 0.200). This indicates that firm value is not more sensitive to changes in resident domestic economic earnings than changes in resident foreign earnings. However, given that the size of the difference in coefficients is larger than related differences in coefficients in Table 9, I conclude that additional noise in these estimates may be an important factor in this result.

The results from testing the value-relevance of the four earnings components (Table 10 Panel A) and their relative valuations (Table 10 Panel B) are consistent for the fixed-effects specification (Columns (2) of Panels A and B). Each of the resident earnings components is value-relevant with slightly larger coefficients than the main result. The coefficients on the shifted components are not significantly different from zero and closer to zero in size, compared to the main specification. Similar to the main results, the resident components are valued similarly but significantly different than the shifted components from either jurisdiction. Therefore, the valuation of the components persists after considering industry-specific factors and annual variation.

6.1.3.1.2 Conclusion. In conclusion, partitioning reported earnings further by their income shifting properties provides additional information on the market's valuation of earnings based on their economic, reporting, and shifting properties. First, decomposing total earnings more precisely into the four components highlights the market's preference for earnings created and reported in the same jurisdiction. Second, the new four-component decomposition model reveals that the market values domestic and foreign earnings created and reported in their respective jurisdictions similarly, which is a more refined result compared to prior evidence based on a two-component decomposition. Additionally, the valuation tests reveal that the market does not value income shifted from either the domestic or foreign jurisdiction.

6.2 Tests of Hypotheses H2a-h

In this section, I present tests of Hypotheses H2a-H2h. This set of hypotheses predicts the valuation of the economic earnings components and the income shifting components for higher versus lower levels of institutional investment (H2a-H2d) and analyst coverage (H2e-H2h). In these tests, institutional investment proxies for investor sophistication, while analyst coverage proxies for firms' information environments. I also present valuation tests of reported earnings and resident economic earnings components. I first discuss tests of hypotheses predicting the valuation of the economic earnings and shifted earnings components as a function of institutional ownership, followed by a discussion of the valuation of these components as a function of analyst coverage. I also present results on the valuation of resident economic earnings, for which I have not hypothesized relations that vary for different levels of institutional ownership or analyst coverage.

Table 11 presents the valuation of the reported earnings components and economic earnings components for different levels of institutional ownership. Table 12 presents the

valuation of the resident and shifted economic earnings components for different levels of institutional ownership. Similarly, Tables 13 and 14 present valuation tests for high versus low levels of analyst coverage. In each of these tables, the variables *High_IIHoldings and High_ACoverage* are indicator variables equal to one for top-tercile values for the number of 13-F institutional investors (Tables 11-12) and the number of analysts (Tables 13-14) for a given firm-year. The number of 13-F institutions for a given firm-year in the top tercile ranges from 190 to 2208 and has a mean (median) of 577 (439). The number of institutions in the bottom tercile, that is, the group with lower levels of institutional ownership, ranges from 2 to 103 and has a mean (median) of 41 (37). Of 867 observations, 507 are in the top tercile and 360 in the bottom tercile. The number of analysts in the top tercile ranges from 11 to 55 with a mean (median) value of 18 (16), while the number in the bottom tercile ranges from 1 to 4 with a mean (median) of 2 (2). Of 1,743 observations in the analysis, 777 are in the top tercile, while 966 are in the bottom tercile of analyst coverage. Similar to the results reported for hypotheses H1a-d, the tables include an industry-year fixed effects specification. I present the main results in Column (1) and discuss any inconsistencies across specifications.

For each set of results, I first present the intercept values for the earnings components for each of the two groups and next compare differences in the intercepts between the groups having high versus low levels of institutional ownership. Next, I present the slope values of the earnings components and institutional ownership variables. Finally, I present and discuss differences in the valuation of the earnings components between the two groups. Hypotheses H2a-h predict significant valuation differences between groups and, therefore, involve the interaction terms between the earnings and group indicators.

6.2.1 Differences in the Valuation of Reported Earnings for Higher versus Lower Levels of Institutional Ownership

To provide a baseline for the interpretations of the unreported economic and shifted earnings components and extend the reported earnings components, I examine valuation differences for the reported earnings components between groups with higher versus lower institutional ownership levels.

First, I present intercept values for the two institutional ownership groups. As shown in Column (1) of Table 11, the intercept for the group with lower institutional ownership, indicated by the constant, is -0.112 (p = 0.000). The intercept difference between the two groups, indicated by the coefficient on *High_IIHoldings* is negative and significant at the 10% level (-0.053, p = 0.085). The intercept for the group with the higher institutional ownership is -0.165 (untabulated), and a joint F-test of *High_IIHoldings* and the constant term reveals that it is significantly different from zero (F= 70.64, p = 0.000). Therefore, the intercept values for each group are significantly different and begin at significantly negative values of cumulative abnormal returns for a given firm-year.

Next, I discuss the slope values for the valuation of the reported earnings components for the two groups. The coefficient on the change in domestic reported earnings, $\Delta DEPS/P$, is 0.679 (p = 0.000), and the coefficient on the change in foreign reported earnings, $\Delta FEPS/P$, is 1.134 (p = 0.000), indicating significantly positive valuations of these components for the group with lower institutional ownership. I calculate the valuation of the reported earnings components for the group with higher institutional ownership as a joint test of coefficients between the main and interaction terms. The valuation coefficients for the group with higher levels of institutional ownership are -0.110 for the domestic reported earnings component and 0.234 for the foreign

reported earnings component. Contrary to the valuation coefficients for the group with lower levels of institutional ownership, the valuation of domestic and foreign reported earnings is not significant for higher levels of institutional ownership. The interaction terms further test the difference in the valuation between the two groups. The valuation of the domestic reported earnings component is highly significantly different (-0.789, p = 0.000) between groups and the valuation of the foreign reported earnings component is significantly different (-0.900, p = 0.094) between the two groups.

Overall, the reported earnings components are valued significantly for lower levels of institutional ownership but are not value-relevant for the group with higher levels of institutional ownership. This result demonstrates that less sophisticated investors accept the jurisdictional classification of earnings reported by firms, unlike sophisticated investors who are aware that reported components are not a true representation of jurisdiction-specific earnings.

6.2.1.1 Exceptions from Fixed-effects Specifications. Unlike the results in Column (1), where the intercept and intercept difference between groups is significant, specifying industry and year fixed effects (Column (2)) results in an insignificant intercept and intercept difference. The significant difference in intercepts between the two groups means that the two groups are associated with significantly different cumulative abnormal returns regardless of the values of the domestic and foreign reported components. However, when industry-year factors are considered in the valuation of these components, cumulative abnormal returns are similar for more sophisticated investors and less sophisticated investors, regardless of the values of the reported components.

6.2.2 Differences in the Valuation of Economic Earnings for Higher versus Lower Levels of Institutional Ownership

I present intercept and slope values for the two groups before testing hypotheses H2a and H2b, which predict that the group with higher institutional holdings value the economic earnings components differently than the group with lower institutional holdings. The main results for the economic earnings components are presented in Column (3) of Table 11. The intercept for the group with lower institutional ownership, provided by the constant, is -0.114 (p = 0.000), and the intercept difference between the two groups, indicated by the coefficient on *High_IIHoldings* is negative and significant (-0.050, p = 0.099). The intercept for the group with the higher institutional ownership is -0.164 (untabulated), and a joint F-test of *High_IIHoldings* and the constant term reveals that it is significantly different from zero (F= 70.54, p = 0.000). Therefore, the coefficients for the intercepts of the two groups indicate that both groups are statistically significantly different for any values of the economic earnings components and begin at negative values of cumulative abnormal returns for a given firm-year.

In examining the slope coefficients, I find that the economic earnings components are value-relevant for the group having lower levels of institutional ownership and are not value-relevant for higher levels of institutional ownership. The coefficient on the change in domestic economic earnings is 0.746 (p = 0.004), and the coefficient on the change in foreign economic earnings is 0.813 (p = 0.000), indicating significantly positive valuations of these components for the group with fewer institutional investors. The coefficients for the group with more institutional investors, calculated from a joint test of coefficients, are not significantly different from zero. The coefficients are 0.085 for the domestic economic earnings component and -0.103 for the foreign economic earnings component. Therefore, similar to the results for the reported

earnings components, it appears that less sophisticated investors value the underlying domestic and foreign economic earnings components, while more sophisticated investors do not value these components. This result is consistent with the theory that domestic information is easily accessible (e.g., Duru & Reeb, 2002; Thomas, 1999) and preferred by domestic investors (e.g., Huang, 2015; Van Nieuwerburgh & Veldkamp, 2009). Therefore, less sophisticated investors can unravel the underlying economic earnings in domestic and foreign jurisdictions. However, more sophisticated investors may not consider the underlying economic earnings components value-relevant, although they have the resources to estimate them since they have different reporting properties.

Hypotheses H2a and H2b predict a significant difference in the valuation of domestic economic earnings and foreign economic earnings, respectively, between the two institutional ownership groups. The coefficients on the interaction terms indicate valuation differences between higher versus lower levels of institutional ownership. As presented in Column (3) of Table 11, the valuation of the domestic economic earnings component (-0.662, $p = 0.072$) and the valuation of the foreign economic earnings component are each significantly different (-0.916, $p = 0.000$) between the two groups. Therefore, hypotheses H2a and H2b are supported. However, the valuation difference is not consistent with the theoretical expectation that more sophisticated investors can value the unobservable economic components and that less sophisticated investors cannot unravel these amounts. The results from the slope coefficients indicate that the differences between groups are due to the valuation of economic components by less sophisticated investors alone.

6.2.2.1 Exceptions from the Fixed-effects Specification. The results presented above have exceptions across the fixed-effects specifications. First, the coefficient on the change in

domestic economic earnings is smaller and less significant (0.434, p = 0.087) for the lower institutional ownership group after controlling for industry and year fixed effects. Second, the difference in valuation of the domestic economic earnings component between groups is insignificant, controlling for industry-year fixed effects (-0.323, p = 0.365). Third, the intercept (-0.248, p = 0.556) and intercept difference between groups (-0.003, p = 0.930) is not different than zero. These results suggest that the value-relevance of the domestic economic earnings component observed for the group with lower institutional ownership is likely a result of these investors valuing industry or annual information.

6.2.3 Differences in the Valuation of Shifted and Resident Earnings Components for Higher versus Lower levels of Institutional Ownership

The valuation coefficients for the shifted and resident components are presented in Column (1) of Table 12. I first discuss the intercepts and slopes for each group, followed by the test for hypotheses H2c and H2d. The intercept for the group with lower number of institutional investors, provided by the constant, is -0.108 (p = 0.000), and the intercept difference between the two groups, indicated by the coefficient on *High_IIHoldings* is negative and significant (-0.055, p = 0.077). The intercept for the group with the higher number of institutional investors is -0.163, and a joint F-test of *High_IIHoldings* and the constant term reveals that it is significantly different from zero (F= 63.46, p = 0.000). Therefore, the intercepts both groups experience are marginally significantly different from each other and begin at negative values of cumulative abnormal returns for a given firm-year.

For the group with lower levels of institutional ownership, both resident earnings components are valued positively while the shifted earnings components are not valued. The coefficient on the change in resident domestic earnings is 1.895 (p = 0.010), indicating that this

component is value-relevant where firm-years have fewer institutional investors. The coefficient on the change in resident foreign earnings is 1.665 ($p = 0.046$), indicating a significantly positive valuation by the group with fewer institutional investors. Alternately, the coefficients on the change in domestic shifted component (-0.349, $p = 0.146$) and foreign shifted component (1.121, $p = 0.248$) are consistent with not being valued by the group with fewer institutional investors. These results suggest that less sophisticated investors disentangle resident components of earnings but do not value income shifted in either direction.

Foreign earnings shifted is value-relevant for the group with more institutional investors. The coefficients for the group with more institutional investors, calculated from a joint test of coefficients, are -0.1635 ($F = 0.64$, $p = 0.422$) for the resident domestic earnings component and 0.699 ($F = 0.92$, $p = 0.338$) for the resident foreign component. The coefficient on the change in domestic shifted earnings is 0.476 ($F = 1.69$, $p = 0.195$) and the coefficient on the change in foreign shifted earnings is -1.679 ($F = 3.55$, $p = 0.06$). The negative valuation of income shifted to the domestic jurisdiction from the foreign jurisdiction is consistent with the higher domestic tax rate. These earnings may also be negatively valued because they are shifted away from foreign growth markets. The value-relevance of foreign shifted earnings, but not domestic shifted earnings, indicates that more sophisticated investors are able to disentangle the finer components of earnings and that they are selective in their valuation of earnings shifted into the domestic jurisdiction.

Hypotheses H2c and H2d predict that income shifted from the domestic jurisdiction and foreign jurisdictions, respectively, are valued differently by more sophisticated investors compared to less sophisticated investors. The coefficients on the interaction terms test the differences in the valuation between the two groups. The tests fail to show that resident domestic

and foreign earnings are valued differently between the two groups. However, each shifted earnings component is valued significantly differently between the two groups. The coefficient on the change in resident domestic earnings is -1.375 (p = 0.161), and the coefficient on the change in resident foreign earnings is -0.965 (p = 0.383). The coefficient on the change in domestic shifted earnings is 0.825 (p = 0.06), and the coefficient on the change in foreign shifted earnings is -2.800 (p = 0.034). Therefore, H2c and H2d are supported. Although I find support for these hypotheses, the results do not support the theoretical explanation expected in this study. I predict that valuation differences between groups arise from sophisticated investors' ability to recognize the underlying earnings components compared to less sophisticated investors. However, the results reveal that valuation differences are associated with less sophisticated investors' valuation of resident components, and more sophisticated investors' selective valuation of foreign income shifted.

6.2.3.1 Exceptions from the Fixed-effects Specification. The fixed-effects specification reveals that the valuation coefficients of some components may be attenuated by industry-specific factors and annual variation, while the valuation coefficients of other components are stronger when controlling for these effects. Specifically, the coefficient on domestic resident earnings for the lower institutional ownership group is smaller in size and significance (1.310, p = 0.063) when controlling for industry and year fixed effects. Second, similar to the reported and economic components results, the intercept and intercept difference between groups is no longer significant when controlling for industry and year effects. Alternately, the size and significance of the coefficient capturing the difference in valuation of domestic earnings shifted out is larger (1.043, p = 0.014) than the main specification. The fixed effects specification also reveals that

more sophisticated investors may value the domestic resident component, after controlling for industry-year fixed effects, as the coefficient from the joint test is significant at the 5% level.

6.2.4 Differences in the Valuation of Reported Earnings for Higher versus Lower Levels of Analyst Coverage

Table 13 presents the valuation coefficients for higher versus lower levels of analyst coverage. I first discuss the intercepts and slopes for high analyst coverage versus low analyst coverage groups presented in Column (1). The intercept for the group with lower analyst coverage, provided by the constant, is -0.082 (p = 0.000). The intercept difference between the two groups, indicated by the coefficient on *High_ACoverage*, is significantly negative (-0.062, p = 0.011). The intercept for the group with the higher analyst coverage is -0.143, and a joint F-test of *High_ACoverage* and the constant term reveals that it is significantly different from zero (F = 63.00, p = 0.000). Therefore, the group with lower levels of analyst coverage is significantly different from the group with higher levels of analyst coverage for any values of the reported earnings components.

For the group with lower analyst coverage, the coefficient on the change in domestic reported earnings is 0.514 (p = 0.000), and the coefficient on the change in foreign reported earnings is 1.651 (p = 0.000), indicating significantly positive valuations of these components. This result is consistent with investors valuing jurisdiction-specific reported earnings at face value where there is less information in the market.

The coefficients for the group with higher analyst coverage, calculated from a joint test of coefficients, is 0.127 (F = 0.542, p = 0.462) for the domestic reported earnings component and -0.246 (F = 0.270, p = 0.603) for the foreign reported earnings component. Domestic and foreign reported earnings are not value-relevant for firm-years with higher analyst coverage. This result

indicates that a better information environment is associated with an understanding that reported values constitute jurisdiction-specific earnings and earnings shifted from the other jurisdiction.

The interaction terms further test the difference in the valuation between the two groups. The valuation of the domestic reported earnings component is significantly different (-0.387, p = 0.054) between groups and the valuation of the foreign reported earnings component is significantly different (-1.899, p = 0.000) between the two groups. Overall, the results indicate that the level of analyst coverage affects the value-relevance of reported earnings components significantly.

The results are generally consistent when controlling for industry and year fixed effects. Controlling for industry and year fixed effects likely reduced noise in the estimation. Also, the significance level of the coefficient on the difference in valuation of domestic reported earnings between groups increases from the 10% to 5% level of significance.

6.2.5 Differences in the Valuation of Economic Earnings for Higher versus Lower levels of Analyst Coverage

Hypotheses H2e and H2f predict a significant difference in the valuations of domestic and foreign economic earnings, respectively, for higher versus lower levels of analyst coverage. I discuss the intercepts and slopes for the two groups before presenting the tests of the hypotheses. Column (3) of Table 13 shows the intercept for the group with lower analyst coverage, provided by the constant, is -0.076 (p = 0.000). The intercept difference between the two groups, indicated by the coefficient on *High_ACoverage* is negative and significant (-0.068, p = 0.005). The intercept for the group with the higher analyst coverage is -0.144, and a joint F-test of *High_ACoverage* and the constant term reveals that it is significantly different from zero (F= 63.29, p = 0.000). Therefore, the group with lower levels of analyst coverage is significantly

different from the group with higher levels of analyst coverage for any values of the economic earnings components.

For the group with lower analyst coverage, the coefficient on the change in domestic economic earnings is 0.955 (p = 0.000), and the coefficient on the change in foreign economic earnings is 0.560 (p = 0.000), indicating significantly positive valuations of these components. For the group with higher analyst coverage, a joint test of coefficients reveals a valuation coefficient of 0.242 (F = 0.718, p = 0.397) for domestic economic earnings and -0.111 (F = 0.340, p = 0.560) for foreign economic earnings. Contrary to the valuation of economic earnings where there is lower analyst coverage, the valuations of domestic and foreign economic earnings are not significant for higher analyst coverage. These results fail to show that more information and analysis of earnings are associated with the value-relevance of unobserved economic earnings. Economic earnings are recognized and valued positively by investors when fewer analysts provide information.

Tests of hypotheses H2e and H2f are provided by the coefficients on the interaction terms, which indicate valuation differences between groups. The valuation of the domestic economic earnings component is significantly different (-0.713, p = 0.024) between groups. The valuation of the foreign economic earnings component is significantly different (-0.672, p = 0.004) between the two groups. The valuation of domestic and foreign economic earnings differs by analyst coverage. Thus, I find support for hypotheses H2e and H2f.

The results are consistent when controlling for industry and year fixed effects. Controlling for industry and year fixed effects reduces the significance level on the intercept difference between groups from 1% to the 5% level of statistical significance.

6.2.6 Differences in the Valuation of Shifted and Resident Earnings Components for Higher versus Lower levels of Analyst Coverage

Hypotheses H2g and H2h predict significant differences between higher and lower levels of analyst coverage in valuing domestic and foreign shifted earnings components, respectively. I first present the intercepts and slopes for the two groups before discussing the tests of the hypotheses. The valuation of shifted and resident economic earnings components by levels of analyst coverage are presented in Table 14, and I discuss Column (1) as the main result. The intercept for the group with lower analyst coverage is -0.075 (p = 0.000), and the intercept difference between the two groups, indicated by the coefficient on *High_ACoverage*, is negative and significant (-0.074, p = 0.002). The intercept for the group with the higher analyst coverage is -0.149, and a joint F-test of *High_ACoverage* and the constant term reveals that it is significantly different from zero (F= 67.74, p = 0.000). Therefore, the intercepts both groups experience are significantly different and begin at negative values of cumulative abnormal returns for a given firm-year.

For the group with lower analyst coverage, similar to the valuation for the full sample, the resident earnings components are valued positively, while the shifted earnings components are not valued. The coefficient on the change in resident domestic earnings is 2.978 (p = 0.000), and the coefficient on the change in resident foreign earnings is 1.274 (p = 0.058), indicating significantly positive valuations for the group with lower analyst coverage. The coefficient on the change in the domestic shifted earnings component is -0.201 (p = 0.323), and the coefficient on the change in the foreign shifted earnings component is -0.203 (p = 0.761). Therefore, it appears that the main results are common to instances where less information is available to market participants.

For the group with higher analyst coverage, except for domestic shifted earnings, none of the other shifted or resident components are value-relevant. The coefficients for the group with higher analyst coverage, calculated from a joint test of coefficients, is 0.466 (F = 0.658, p = 0.417) for the resident domestic earnings component and 0.764 (F = 0.760, p = 0.384) for the resident foreign earnings component. The coefficient on the change in domestic shifted earnings is 0.597 (F = 3.654, p = 0.056) and the coefficient on the change in foreign shifted earnings is 1.092 (F = 2.277, p = 0.131). Since the market recognizes each of the resident components in instances with less information, that is, lower analyst coverage, I conclude that more analysts are associated with value-relevant information about domestic earnings shifted out.

The interaction terms in Column (1) Table 14 test hypotheses H2g and H2h. The difference in the valuation of domestic shifted earnings is significantly different between groups (0.799, p = 0.032), providing support for H2g. The difference in valuation of domestic shifted earnings between the two analyst coverage groups is consistent with the theory that more analysts are associated with recognizing the domestic shifted component. The results show that the group with lower analyst coverage does not value domestic shifted earnings but the group with more analyst coverage values this component. For hypothesis H2h, the difference in the valuation of foreign shifted earnings is not significantly different between groups (1.295, p = 0.188), and I fail to reject the null hypothesis. The results also show that neither the group with lower analyst coverage nor higher analyst coverage values the foreign shifted earnings component. Therefore, I find support for hypothesis H2g but not hypothesis H2h.

The results are generally consistent for the industry-year specification. A minor deviation is the significance level on the valuation coefficient on foreign resident earnings for the lower analyst coverage group, which increases to the 5% level of significance. A more notable

exception is the higher analyst coverage group's significant valuation of domestic resident earnings (Table 14 Column (2)). The valuation coefficient is 0.479 ($p = 0.015$). Therefore, I conclude that the results in this section are robust to specifying industry-year fixed effects.

6.2.7 Conclusion

In this section, I test whether the valuation of the economic and shifted earnings components varies by investor sophistication. I measure investor sophistication using (i) the number of 13-F institutional investors and (ii) the number of analysts following a firm in a given year. While the institutional ownership groups differentiate between firm-years having more and less sophisticated investors, the analyst coverage groups distinguish between firms' information environments, and each group includes both more and less sophisticated investors. Contrary to the theoretical predictions in this study, I generally find that lower investor sophistication groups are able to recognize the underlying economic and resident earnings components. I additionally find that higher investor sophistication is associated with a more selective valuation of these components. The two measures of investor sophistication provide a distinct result on the earnings component valued by the higher sophistication group: instances with higher institutional ownership are associated with the valuation of foreign shifted earnings, while instances with higher analyst coverage are associated with the valuation of domestic shifted earnings.

Testing the value-relevance of the earnings components by the number of institutional investors, I find that more sophisticated investors do not value reported, economic, resident, or domestic shifted earnings components. More sophisticated investors appear to be more selective in their valuation of the earnings components, and only value foreign earnings shifted. I predict that more sophisticated investors are likely to unravel unreported components because of their knowledge and abilities. However, the results show that less sophisticated investors in the

sample can unravel these underlying components and, in addition to reported values, also recognize economic and resident earnings components. Hypotheses H2a-H2d are supported as the results show significant valuation differences between institutional ownership groups for domestic and foreign economic and shifted earnings components. Therefore, I conclude that valuation differences exist between more versus less sophisticated investors. However, the results do not support the theoretical reasons predicted by this study; less sophisticated investors value unobserved components, and more sophisticated investors appear to be more discriminating in their valuation.

The tests of value-relevance of the economic and shifted earnings components by analyst coverage also show significant differences between groups. Specifically, the valuation difference is significant for domestic and foreign components of reported, economic, and domestic shifted earnings. I find support for hypothesis H2e-g. The results fail to show a significant valuation difference between analyst coverage groups for foreign earnings shifted, and I do not find support for H2h. The results show that underlying resident components are not too complex for investors to recognize where there is lower analyst coverage or less information about these components available in the market. However, I do not find evidence that the shifted earnings components are valued in this instance. I do not find evidence that the underlying earnings components, except for domestic shifted earnings, are value-relevant in instances of higher analyst coverage, suggesting that investors are more discerning in valuing earnings where more information is available. Therefore, I conclude that firms' information environments affect the valuations of economic and shifted earnings components. However, similar to the results for the institutional ownership tests, the reason for valuation differences between groups is different than the theoretical reasoning presented. I find evidence that the underlying earnings components

are value-relevant where less information is available and do not find evidence that they are value-relevant where more information is available.

7. Conclusion

I measure and test the valuation of economic earnings and income shifting of U.S. MNCs in their domestic and foreign jurisdictions. I first distinguish between the definition of domestic and foreign earnings reported by firms and earnings created in domestic and foreign jurisdictions. I then develop two earnings decomposition models that decompose total earnings into (a) domestic and foreign economic earnings and (b) shifted and resident components of economic earnings. I estimate country-specific locations and economic earnings for U.S. MNCs and use these values to calculate domestic and foreign economic earnings and income shifted in a given direction for a given firm-year. I test the validity of the economic earnings measures by testing the validity of the estimation procedure on a sample of domestic-only firms across 81 countries. I test the validity of the income shifting measure by testing its association with tax avoidance and existing measures. Finally, I hypothesize and test the value-relevance of the measures created in this study and further test differences in valuation across investor types to reconcile differing views in prior literature.

This study makes theoretical and methodological contributions. First, it contributes to the foreign earnings valuation studies in the financial accounting literature by conceptualizing economic earnings discussed but not tested in these studies. Second, it clarifies mixed evidence about the relative valuation of domestic and foreign reported earnings by classifying the source of foreign information used. Third, it reconciles assumptions about investors' valuation of complex foreign earnings components in the financial accounting literature to those in the tax accounting literature.

The methodological contributions include new earnings measures, more accurate segment data, and replications of prior work. The estimation of country-specific economic earnings uses

publicly available financial statement information. In the process of measuring domestic and foreign economic earnings, I create algorithms to estimate U.S. MNCs' country-specific locations, as well as assets, employees, and earnings in these countries. I also create algorithms to classify geographic and non-geographic segment data more accurately than Compustat. These tools are replicable and can be used by future work to estimate country-specific information for U.S. MNCs or to study segments. This study also provides a distinct measure of income shifting and evidence on the valuation of income shifting, which has not previously been examined. Finally, I replicate tests of foreign earnings valuation (Bodnar & Weintrop, 1997) and income shifting (Klassen & Laplante, 2012a; Chen et al., 2018; Collins et al., 1998; Dyreng & Markle, 2016) for this study's sample.

This study highlights the importance of measuring economic earnings to examine jurisdiction-specific earnings. The financial accounting literature argues that domestic and foreign earnings are valued differently because of their economic properties. However, they test the valuation and relative valuation of domestic and foreign reported earnings, each of which contain economic properties of both domestic and foreign jurisdictions because of income shifting. I measure and find that earnings created in domestic and foreign jurisdictions, that is, economic earnings, are recognized by investors and valued significantly differently from each other. More importantly, the results show that domestic economic earnings are valued higher than foreign economic earnings. Prior literature finds that foreign reported earnings are valued higher than domestic reported earnings and attributes the relatively higher valuation to jurisdiction-specific economics. Therefore, I find that investors can unravel where earnings are created, value these components, and value them differently than reported components.

This study provides unexpected evidence on the valuation of unreported components by different levels of investor sophistication and evidence consistent with the tax accounting literature's assumptions of investor sophistication. As predicted, more sophisticated investors value reported, economic, and shifted earnings components differently than less sophisticated investors. I expect that more sophisticated investors recognize economic and shifted components while less sophisticated investors rely on reported values. However, I find that less sophisticated investors value domestic and foreign economic earnings components, consistent with assumptions in the tax accounting literature and contrary to views about foreign complexity in the financial accounting literature. Moreover, sophisticated investors appear to be selective in their valuation of the underlying components of earnings. They do not value reported or economic earnings but value income shifting components. Therefore, this study reconciles mixed views about investor sophistication in valuing foreign earnings, thus providing evidence consistent with the tax accounting literature.

The limitations of this study are the assumptions used to estimate foreign economic earnings. First, I assume which countries are associated with geographic segments because of limited disclosure. U.S. MNCs rarely disclose foreign country-specific locations in segment disclosures but instead use continents, regions, or broad terms ("Foreign" or "Other") to refer to their foreign locations. I assume that any reference to a continent or broad region includes all the countries for which sufficient country-level data is available on Compustat. The second assumption is that U.S. MNCs in my sample do not have significant operations outside the 81 countries I use to estimate country-level productivity. The sample is limited to 81 countries because of data availability and sample selection criteria that I apply to domestic-only firms available on Compustat. Next, in estimating country-level productivity, I assume an equal

allocation of U.S. MNC segment assets and the number of employees across countries I assign to that segment. Therefore, the limitations of this study are assumptions about the countries associated with geographic segments, a limited number of countries a U.S. MNC might operate in, and the equal allocation of segment fundamentals across countries.

I expect that future work can improve the economic earnings and income shifting measures developed in this study. The measure of economic earnings developed in this study is preliminary and can be improved by (i) improving the estimation model and (ii) matching domestic-only firms used to estimate productivity with U.S. MNC subsidiaries in the sample. The productivity function in this model includes firm-level assets, the number of employees, and fixed effects for countries, years, and industries. Future work can improve the model by incorporating specific country characteristics such as GDP, total population, education levels (see Barro, 1991; Mankiw, Romer, & Weil, 1992). The model can also be expanded to include bureaucratic delays, infrastructure quality, corruption quality, political rights, and democracy measured by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). Second, while I include all domestic-only firms with available data, future work can refine the estimation of country-level productivity by matching domestic-only firms to U.S. MNC subsidiaries in that country using more refined criteria. Additionally, income shifting measured in this study is all-encompassing and can be refined to capture specific types of income shifting based on activity, complexity, or aggressiveness. I expect my domestic and foreign shifted components decomposition to serve as a starting point for future decomposition models.

Finally, future work can also measure the economic earnings and income shifting components post-2018 because of changes in U.S. corporate taxes and country-by-country reporting. The Tax Cuts and Jobs Act of 2017 and the financial crisis of 2018 changed the U.S.'

tax and perhaps economic landscape relative to foreign jurisdictions. Since the U.S. is no longer the highest tax jurisdiction, I expect that a post-2018 examination of the valuation of the income shifting components may require decomposing the shifted components further into shifting to higher and lower tax foreign jurisdictions. In addition, the Organisation for Economic Co-operation and Development (OECD) is implementing Base Erosion and Profit Shifting (BEPS) Action 13 – Transfer Pricing Documentation and Country-by-Country Reporting. BEPS Action 13 requires MNCs of OECD member countries to disclose financial and tax information by country. Therefore, the measures in this study can be redefined post-2018 because of significant changes to U.S. corporate taxes and worldwide reporting. The valuation, relative valuations, and investor-specific valuations of the economic earnings and income shifting components can also be re-examined post-2018 because of the change in the economic landscape.

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Appendix A

List of ISO Country Codes in the Sample with Country Names

ARE	United Arab Emirates	GHA	Ghana	NOR	Norway
ARG	Argentina	GRC	Greece	NZL	New Zealand
AUS	Australia	HKG	Hong Kong	OMN	Oman
AUT	Austria	HRV	Croatia	PAK	Pakistan
BEL	Belgium	HUN	Hungary	PER	Peru
BGD	Bangladesh	IDN	Indonesia	PHL	Philippines
BGR	Bulgaria	IND	India	POL	Poland
BHR	Bahrain	IRL	Ireland	PRT	Portugal
BMU	Bermuda	ISR	Israel	PSE	Palestine
BRA	Brazil	ITA	Italy	QAT	Qatar
BWA	Botswana	JAM	Jamaica	ROU	Romania
CAN	Canada	JOR	Jordan	RUS	Russia
CHE	Switzerland	JPN	Japan	SAU	Saudi Arabia
CHL	Chile	KEN	Kenya	SGP	Singapore
CHN	China	KOR	Korea, South	SVN	Slovenia
CIV	Cote d'Ivoire	KWT	Kuwait	SWE	Sweden
COL	Colombia	LKA	Sri Lanka	THA	Thailand
CYM	Cayman Islands	LTU	Lithuania	TTO	Trinidad and Tobago
CYP	Cyprus	LUX	Luxembourg	TUN	Tunisia
DEU	Germany	LVA	Latvia	TUR	Turkey
DNK	Denmark	MAR	Morocco	TWN	Taiwan
EGY	Egypt	MEX	Mexico	UKR	Ukraine
ESP	Spain	MLT	Malta	USA	United States
EST	Estonia	MUS	Mauritius	VNM	Vietnam
FIN	Finland	MYS	Malaysia	ZAF	South Africa
FRA	France	NGA	Nigeria	ZMB	Zambia
GBR	United Kingdom	NLD	Netherlands	ZWE	Zimbabwe

Appendix B

Country-Level Comparisons of Assets and Employees between Domestic-Only Firms and U.S. MNC Subsidiaries

Table 1: Country-level comparison of assets and employees between domestic-only firms and U.S. MNC subsidiaries

ISO Country Code	No. of domestic-only firms	No. of U.S. MNCs		Median Assets (domestic-only)	Median Assets (U.S. MNC)		Mean Assets (domestic-only)	Mean Assets (U.S. MNC)		Median Employees (domestic-only)	Median Employees (U.S. MNC)		Mean Employees (domestic-only)	Mean Employees (U.S. MNC)	
ARE	42	887	***	2.36	0.83	***	8.93	5.18		0.704	0.338	*	0.812	3.612	***
ARG	50	534	***	1.01	0.82	***	2.75	5.32		0.580	0.362		0.606	14.169	
AUS	2,025	669	***	2.51	0.72	***	123.32	4.49	***	0.536	0.329	***	8.892	1.194	*
AUT	76	1,388	***	0.97	0.81	***	7.66	2.78	*	0.495	0.322	***	0.657	0.732	
BEL	122	1,392	***	1.00	0.81	***	17.97	2.80		0.363	0.321	***	0.996	0.727	
BGD	182	872	***	1.77	0.74	***	4.75	4.54		4.181	0.411	***	6.559	4.208	**
BGR	53	1,387	***	1.39	0.81	***	2.63	2.78		0.886	0.323	***	1.183	0.740	**
BHR	15	849	***	1.94	0.78	***	3.14	4.93		0.677	0.393	***	0.695	4.707	***
BMU	29	626	***	1.68	0.92	***	73.41	2.95	**	1.098	0.336	***	10.837	9.247	
BRA	206	582	***	1.38	0.82	***	49.11	5.06	***	0.855	0.393	***	1.145	13.467	
BWA	13	259	***	0.75	0.82	**	0.86	1.84	***	1.627	0.289	***	3.041	0.448	***
CAN	2,489	1,250	***	1.77	0.86	***	71.71	4.04	***	0.368	0.332	***	2.866	6.397	
CHE	206	1,395	***	0.99	0.81	***	6.48	2.76		0.427	0.323	***	0.503	0.751	*
CHL	120	525	***	1.56	0.82	***	25.32	5.36	***	0.621	0.368	***	0.816	14.379	
CHN	2,723	878	***	1.86	0.74	***	2.94	4.47		0.883	0.413	***	1.263	4.305	***
CIV	15	261	***	0.90	0.83		0.92	1.86	***	0.460	0.289	***	1.202	0.448	***
COL	26	527	***	2.34	0.82	***	2.40	5.33		0.810	0.362	**	0.875	14.428	
CYM	20	632	***	1.60	0.91	***	5.10	2.94	*	1.087	0.334	***	1.821	9.183	
CYP	54	1,387	***	2.04	0.81	***	8.57	2.78	**	0.379	0.321		1.702	0.730	
DEU	699	1,472	***	0.92	0.81	***	13.44	2.70	***	0.428	0.324	***	0.885	0.872	
DNK	125	1,389	***	0.92	0.81	***	3.05	2.78		0.402	0.322	***	0.604	0.732	
EGY	138	314	***	1.57	0.83	***	51.74	1.89		0.951	0.292	***	1.593	0.439	***
ESP	164	1,391	***	1.36	0.81	***	4.02	2.75		0.423	0.324	***	0.590	0.736	

Table 1 (contd.): Country-level comparison of assets and employees between domestic-only firms and U.S. MNC subsidiaries

ISO Country Code	No. of domestic-only firms	No. of U.S. MNCs		Median Assets (domestic-only)	Median Assets (U.S. MNC)		Mean Assets (domestic-only)	Mean Assets (U.S. MNC)		Median Employees (domestic-only)	Median Employees (U.S. MNC)		Mean Employees (domestic-only)	Mean Employees (U.S. MNC)	
EST	16	1,386	***	0.84	0.81		0.97	2.78	***	0.841	0.321	***	1.200	0.732	***
FIN	125	1,390	***	0.88	0.81	***	57.81	2.78		0.440	0.320	***	2.445	0.731	
FRA	938	1,441	***	0.98	0.81	***	6.66	2.72	**	0.521	0.325	***	0.931	0.734	
GBR	2,275	1,655	***	1.04	0.83	***	20.53	3.57	***	0.579	0.349	***	4.781	0.724	**
GHA	12	261	***	0.86	0.83		1.07	1.86	***	0.707	0.289	***	0.837	0.448	**
GRC	245	1,388	***	1.63	0.81	***	4.22	2.78		0.407	0.321	***	0.502	0.730	*
HKG	140	764	***	2.41	0.75	***	12.30	5.79		0.943	0.610	***	1.603	6.555	***
HRV	79	1,387	***	2.03	0.81	***	19.79	2.77	*	0.645	0.322	***	0.847	0.732	
HUN	33	1,389	***	1.10	0.81	***	8.71	2.77		0.817	0.322	***	1.087	0.744	**
IDN	368	884	***	1.19	0.74	***	7.88	4.46		0.864	0.417	***	1.745	4.251	**
IND	3,165	895	***	1.22	0.74	***	64.48	4.48	***	1.134	0.421	***	5.640	4.693	
IRL	68	1,559	***	1.05	0.83	***	573.83	3.65		0.354	0.340		18.674	0.714	
ISR	299	875	***	1.14	0.79	***	18.83	5.65		0.450	0.404		1.427	5.769	**
ITA	321	1,397	***	1.36	0.81	***	32.74	2.76	**	0.367	0.322	***	0.471	0.732	*
JAM	21	633	***	1.01	0.91	**	1.44	2.94	***	0.349	0.335		0.530	9.174	
JOR	119	849	***	1.97	0.78	***	8.63	4.93		0.538	0.393	**	1.211	4.707	***
JPN	3,881	972	***	0.99	0.72	***	1.18	5.19	**	0.278	0.359	***	0.364	3.863	***
KEN	33	259	***	1.15	0.82	***	1.58	1.84		0.693	0.289	***	3.236	0.448	***
KOR	1,582	885	***	1.17	0.73	***	1.54	4.44		0.337	0.413		0.337	4.279	***
KWT	98	849	***	2.62	0.78	***	20.27	4.93	*	1.042	0.393	***	1.521	4.707	**
LKA	200	872	***	1.38	0.74	***	33.07	4.54		3.099	0.412	***	8.167	4.217	***
LTU	32	1,386	***	0.83	0.81		1.97	2.78		0.969	0.322	***	1.360	0.734	***
LUX	26	1,390	***	1.97	0.81	***	4.37	2.77	*	0.275	0.322		1.087	0.731	
LVA	28	1,386	***	1.34	0.81	***	2.22	2.78		1.821	0.321	***	2.101	0.732	***
MAR	57	261	***	1.26	0.82	***	2.80	1.85		0.359	0.289	**	0.596	0.448	*
MEX	84	913	***	1.34	0.96	***	721.52	5.51		1.040	0.305	***	1.285	37.926	

Table 1 (contd.): Country-level comparison of assets and employees between domestic-only firms and U.S. MNC subsidiaries

ISO Country Code	No. of domestic-only firms	No. of U.S. MNCs		Median Assets (domestic-only)	Median Assets (U.S. MNC)		Mean Assets (domestic-only)	Mean Assets (U.S. MNC)		Median Employees (domestic-only)	Median Employees (U.S. MNC)		Mean Employees (domestic-only)	Mean Employees (U.S. MNC)	
MLT	12	1,386	***	2.09	0.81	***	5.00	2.78		0.707	0.321	***	0.873	0.730	
MUS	29	261	***	1.64	0.82	***	25.90	1.87		1.312	0.289	***	1.810	0.448	***
MYS	1,049	890	***	1.53	0.75	***	12.75	4.43		1.403	0.426	***	2.407	4.218	*
NGA	102	262	***	1.13	0.83	***	2.55	1.87	*	0.884	0.290	***	1.537	0.468	***
NLD	135	1,399	***	0.76	0.81	**	2.56	2.76		0.434	0.322	***	0.627	0.724	
NOR	192	1,389	***	1.58	0.81	***	213.15	2.79	**	0.293	0.322	***	7.327	0.731	*
NZL	166	481	***	1.10	0.69	***	149.72	5.03	**	0.537	0.331	***	4.533	1.150	
OMN	63	853	***	1.59	0.78	***	2.44	4.93		0.825	0.399	***	1.160	4.674	***
PAK	328	872	***	1.06	0.74	***	4.31	4.54		1.459	0.412	***	3.701	4.217	
PER	74	526	***	1.85	0.81	***	4.74	5.37		0.994	0.362	**	1.420	14.513	
PHL	160	891	***	2.49	0.74	***	15.66	4.45	***	0.880	0.415	***	2.649	4.263	
POL	704	1,394	***	0.93	0.81	***	142.74	2.82	*	0.668	0.321	***	2.434	0.732	
PRT	70	1,388	***	1.63	0.81	***	6.59	2.77		0.543	0.322	***	0.761	0.731	
PSE	15	848	***	2.22	0.78	***	2.42	4.94		0.260	0.393		0.331	4.707	***
QAT	19	848	***	3.55	0.78	***	10.44	4.94		0.336	0.393		0.331	4.707	***
ROU	128	1,388	***	1.69	0.81	***	3.54	2.78	*	1.386	0.321	***	2.505	0.732	***
RUS	168	1,525	***	1.33	0.93	***	54.91	9.62		1.175	0.026	***	2.716	1.549	*
SAU	119	850	***	2.21	0.78	***	8.36	4.93		0.120	0.393	***	0.307	4.707	***
SGP	662	898	***	1.28	0.73	***	18.35	4.39		1.056	0.426	***	1.530	4.262	***
SVN	26	1,387	***	1.24	0.81	***	1.75	2.78	***	0.623	0.322	***	0.689	0.732	
SWE	551	1,392	***	0.96	0.81	***	14.12	2.78	***	0.384	0.322	***	0.576	0.731	
THA	560	884	***	1.11	0.74	***	2.85	4.46		1.585	0.415	***	2.528	4.275	*
TTO	13	632	***	1.12	0.91		1.79	2.94	*	0.584	0.334	***	0.603	9.183	
TUN	48	261	***	1.28	0.82	***	2.74	1.84		1.109	0.289	**	1.301	0.448	**
TUR	313	1,525	***	1.24	0.92	***	5.01	4.47		0.415	0.099	***	0.940	1.550	
TWN	1,862	891	***	1.26	0.73	***	55.99	4.44		0.664	0.445	***	1.356	4.191	***

Table 1 (contd.): Country-level comparison of assets and employees between domestic-only firms and U.S. MNC subsidiaries

ISO Country Code	No. of domestic-only firms	No. of U.S. MNCs		Median Assets (domestic-only)	Median Assets (U.S. MNC)		Mean Assets (domestic-only)	Mean Assets (U.S. MNC)		Median Employees (domestic-only)	Median Employees (U.S. MNC)		Mean Employees (domestic-only)	Mean Employees (U.S. MNC)	
UKR	16	1,388	***	1.45	0.81	***	13.88	2.78		8.055	0.322	***	7.783	0.731	***
USA	11,552	2,205	***	1.16	0.98	***	16.85	6.06	***	0.582	0.343	***	3.690	3.430	
VNM	435	882	***	0.97	0.74	***	2.89	4.47		1.228	0.418	***	2.425	5.166	**
ZAF	333	290	***	0.84	0.82		1,092.36	1.91		0.881	0.299	***	1.181	0.571	***
ZMB	12	259	***	1.04	0.82	***	1.05	1.84	***	0.933	0.289	***	1.382	0.448	***
ZWE	33	259	***	1.16	0.82	***	2.85	1.84		1.192	0.289	***	1,554.349	0.448	

For presentation in this table, summary statistics for employees are multiplied by 10,000. For domestic-only firms, asset values are total assets scaled by total sales and employee values are the number of employees scaled by total sales. For U.S. MNCs, asset values are segment identifiable assets scaled by segment sales and employee values are segment number of employees scaled by segment sales. To test the differences between summary statistics between MNC and domestic-only samples for each country, I run a two sample t-test to test the mean differences, a K-sample equality of medians test to test median differences, and a Wilcoxon rank-sum test to test differences in the number of observations. ***, **, and * each represent p-values less than 0.01, 0.05 and 0.10, respectively.

Appendix C

Geographic Segment Name Coding Procedure

I perform the following modifications to the segment names (snms), provided by Compustat's Historical Segment Database, to better identify and classify domestic and foreign geographic segments:

1. I trim the segment name for any leading or trailing spaces and standardize any symbols, characters or conjunctions in the segment name. For example, replacing "&" with "and", standardizing hyphenation in names, replacing forward or backward slashes with a hyphen or "and", where appropriate, etc.

2. I then standardize names, within a segment line, which includes correcting spelling errors, expanding acronyms (e.g., APAC, EMEA), standardizing synonyms, and standardizing capitalization.

3. I then create an algorithm to tag each geographic segment name with one or more of the following tags that apply: geographic, other, elimadj, country, region, areacity, areacity_us, us, usstate, corp, intl. The following table describes criteria for using each of these tags:

Table 1 – Tags used on geographic segment names

Tag	Criteria
Areacity	Segment names that include the names of popular landmarks or cities outside the U.S. I compile a list of these areas and cities from those occurring in the Compustat Historical Segments database after 1994 (three lag years from the start of the sample period).
Areacity_US	Segment names that include the names of popular landmarks or cities in the U.S. I compile a list of these areas and cities from those occurring in the Compustat Historical Segments database after 1994.
Corp	Segment names contatining variations of the word "Corporate"
Country	Segment names that include the names of countries. I identify countries using a comprehensive list of countries in the world.
Elimadj	Segment names containing variations of the words "Eliminations" or "Adjustments"
Intl	Segment names containing variations of the word "International"
Nongeo	Segment names containing words that are non-geographic. I identify lists of these words using those that appear in the Compustat Historical Segments database after 1994.
Other	Segment names containing variations of the name "other" (e.g., "all other", "other foreign", etc.)
Region	Segment names containing names of regions. Regions include continents and can span multiple continents (e.g., APAC, EMEA) or part of a continent (e.g., North Africa, Southeast Asia, etc.). I identify regions using a list created from all regions appearing in the Compustat Historical Segments database after 1994.
US	Segment names containing variations of the "United States", including its territories.
USState	Segment names containing names of states in the U.S. I identify states using a comprehensive list of states.

4. Using the geographic tags above, that is country, region, areacity, areacity_us, usstate, us, intl or corp, I further tag segment lines as either “foreign” or “domestic”. I use these tags to identify geographic segments. Specifically:
    a. If a segment bracket (segment lines where segment assets/employees/sales total assets/employees/sales at the firm-level), in a given firm-year, only contains one of the following tags: areacity, areacity_us, usstate, intl, other, or corp, I consider it to be an operating or business segment. I manually examined a sample of segments to check whether this rule is valid.
    b. I also use the “other” and “nongeo” to eliminate parts of the segment name that were noisy to classify geographic names.
    c. In cases where the corp tag was accompanied by other geographic names, that is where it appeared to be a geographic segment bracket, I substituted the location of the firm’s headquarters, if a segment line specifying the corporate location did not exist.

5. Finally, using a list 81 countries in my final sample of domestic-only firms, I create an algorithm to assign a value of 1 to a set of country-level indicators, where a country exists in a given segment line. I assign countries to broader continents/regions using the classification presented in Appendix D. Specifying detailed tags listed above, helps me maintain a hierarchy for the level at which a name appears. This is useful to prevent double counting of countries/regions. For instance, if a country is specified along with that country's continent in a given geographic segment, the country is only tagged once when it appears as a country and excluded when it appears as a continent.

This matching process, between the geographic names provided in segment data and specific country names, helps me identify a set of possible countries to which a geographic segment name could refer. Additionally, this process helps me create alternatives to Compustat’s identification of geographic segments, among operating and business segments, and Compustat’s classification of “domestic” or “foreign” geographic segments.

Appendix D

Classification of Countries in Compustat Global by Regions Reported in Compustat's Historical Segments for U.S. MNCs

The following panels, arranged by continent, list regions within that continent alongside countries I assign to those regions. Regions are those reported by Compustat's Historical Segments Database for U.S. MNCs for fiscal years beginning 1995. Not all 81 countries listed in Appendix A appear in this list; countries that appear below are those that can be classified into regions reported by Compustat's Historical Segments.

Africa	
North Africa	EGY MAR TUN
West Africa	CIV GHA NGA
Americas	
North America	BMU CAN CYM JAM MEX TTO USA
South America	ARG BRA CHL COL PER VEN
Central America	MEX
Latin America	ARG BRA CHL COL PER VEN MEX
Caribbean	CYM JAM TTO
Asia	
Asia Pacific	AUS BGD CHN IND IDN JPN MYS NZL PAK PHL PNG RUS SGP KOR LKA THA TWN VNM
Greater China	CHN HKG TWN
Far East	CHN HKG IDN JPN KOR MYS PHL RUS SGP THA TWN VNM
Far East North	CHN HKG JPN RUS KOR TWN
Far East South	IDN MYS PHL SGP THA VNM
North Asia	RUS
South Asia	BGD IND PAK LKA
Southeast Asia	IDN MYS PHL SGP THA VNM

Commonwealth of Independent States	RUS	UKR													
Mediterranean	CYP	EGY	ESP	FRA	GRC	HRV	ISR	ITA	MAR	MLT	SVN	TUN	TUR		
Eastern Mediterranean	CYP	EGY	GRC	ISR	TUR										
Middle East	ARE	BHR	EGY	ISR	JOR	KWT	OMN	PSE	QAT	SAU	TUR				
Near East	ARE	BHR	CYP	EGY	ISR	JOR	KWT	OMN	PAK	SAU	TUR				

Europe

Northern Europe	DNK	NOR	SWE	FIN	EST	LTU	GBR	IRL	LVA						
Southern Europe	ITA	GRC	HRV	MLT	CYP										
Western Europe	BEL	ESP	FRA	GBR	IRL	LUX	NLD	PRT							
Central Europe	AUT	CHE	DEU	HRV	HUN	POL	SVN								
Eastern Europe	BGR	HUN	POL	ROU	RUS	UKR									
Continental Europe	AUT	BEL	BGR	CHE	DEU	DNK	ESP	EST	FIN	FRA	HRV	HUN	ITA	LTU	
	LUX	LVA	NLD	POL	PRT	ROU	SRB	SVN	UKR						
Greater Europe	AUT	BEL	CHE	DEU	DNK	ESP	EST	FIN	FRA	GBR	GRC	HRV	HUN	IRL	
	ITA	LTU	LUX	LVA	NLD	NOR	POL	PRT	RUS	SRB	SVN	SWE	TUR	UKR	
Caspian	RUS														
Nordic	DNK	FIN	NOR	SWE											
Black Sea	BGR	ROU	RUS	UKR											
North Sea	BEL	DEU	DNK	FRA	GBR	NLD	NOR								
Eurasia	ARE	AUT	BEL	BGD	BHR	CHE	CHN	CYP	DEU	DNK	EGY	ESP	EST	FIN	
	FRA	GBR	GRC	HKG	HRV	HUN	IDN	IND	IRL	ISR	ITA	JOR	JPN	KOR	
	KWT	LKA	LTU	LUX	LVA	MLT	MYS	NLD	NOR	OMN	PAK	PHL	POL	PRT	PSE
	QAT	ROU	RUS	RUS	SAU	SGP	SRB	SVN	SWE	THA	TUR	TUR	TWN	UKR	VNM
European Union	AUT	BEL	BGR	CYP	DEU	DNK	ESP	EST	FIN	FRA	GBR	GRC	HRV	HUN	
	IRL	ITA	LTU	LUX	LVA	MLT	NLD	POL	PRT	ROU	SVN	SWE			
Former Soviet Union	EST	LTU	LVA	RUS	UKR										

Oceania/Australasia/ Pacific	AUS NZL
Eastern Hemisphere	Countries east of the Prime Meridian, including all countries in Africa (except CIV, MAR, and GHA), Asia, Europe (except PRT, IRL, ISL, ESP and the UK; but including FRA which is mostly in the eastern hemisphere), and Oceania.
Western Hemisphere	Countries west of the Prime Meridian, including all countries in North and South America, MAR, PRT, IRL, ISL, CIV. Also includes GHA, ESP, and the UK since most of these countries lie in the western hemisphere

Appendix E

Example of Six-step Procedure to Calculate Domestic and Foreign Earnings

The following is a step-by-step illustration of the six-step procedure detailed in the Section 4.4.2 of the Research Design. It demonstrates the calculation of domestic and foreign economic earnings for a firm-year from firm-year-segment level data available in Compustat. Before estimating economic earnings for the sample, I edit the segment names using an algorithm described in Section 4.4.1 and Appendix C.

I begin with the following set of segments for a firm with fiscal year ending December 31, 2004:

Row #	datadate	snms	ias	emps	sales
1.	31-Dec-04	Canada	89.96	0.000124	116.94
2.	31-Dec-04	United States	835.108	0.001148	666.661
3.	31-Dec-04	Europe	215.534	0.000192	170.268

where, datadate is the fiscal year end date, snms is the segment name, ias is the identifiable assets, emps is the number of employees for a given firm-year.

Step 1: Identifying country-specific locations

The first step is to refine segment names further to countries. In this instance, Europe is expanded to the 31 countries listed in Appendix D under "Europe". Countries in this list are listed alphabetically in Appendix A and are selected based on the availability of data in Compustat Global. I describe the selection of these countries in Section 4.4.1.

Step 2: Allocating segment-level assets and employees across countries

Since I split "Europe" into 31 country-specific segment lines, I need to divide the segment values for Europe across these countries. I first divide the Assets, Emps and Sales amounts by 31 for each of the new segment lines. Next, for all segment lines, I calculate an Assets to Sales and an Employees to Sales ratio for each segment line.

Row #	datadate	Country	Assets	Emps	Sales	Assets/Sales	Emps/Sales
1	31-Dec-04	CAN	89.96	0.00012	116.94	0.77	0.000001
2	31-Dec-04	AUT	215.53	0.00019	170.27	1.27	0.000001
3	31-Dec-04	BEL	215.53	0.00019	170.27	1.27	0.000001
4	31-Dec-04	BGR	215.53	0.00019	170.27	1.27	0.000001
5	31-Dec-04	CHE	215.53	0.00019	170.27	1.27	0.000001
6-27	31-Dec-04	…					
28	31-Dec-04	RUS	215.53	0.00019	170.27	1.27	0.000001
29	31-Dec-04	SVN	215.53	0.00019	170.27	1.27	0.000001
30	31-Dec-04	SWE	215.53	0.00019	170.27	1.27	0.000001
31	31-Dec-04	TUR	215.53	0.00019	170.27	1.27	0.000001
32	31-Dec-04	UKR	215.53	0.00019	170.27	1.27	0.000001
33	31-Dec-04	USA	835.11	0.00115	666.66	1.25	0.000002

Step 3: Estimating U.S. MNC country-specific productivity.

In step 3, I estimate coefficients from by regressing net income on firm-specific variables for the sample of domestic-only firms (equation (9), Section 4.4.2)). Next, I multiply each of the coefficients from this regression with firm-specific values for the U.S. MNC in each geographic segment line to calculate Economic Net Income to Sales estimate (*EconNI/Sale*) (equation (10), Section 4.4.2). For each firm *i* operating in industry *k* in country *j* in year *t*, *EconNI/Sale* is the sum of the constant term (α_0), the coefficient β_1 multiplied by country-level assets, the coefficient β_2 multiplied by country-level number of employees, the coefficient β_k multiplied by the fixed effect indicator for industry *k*, the coefficient β_t multiplied by the fixed effect indicator for fiscal-year *t*, the coefficient β_j multiplied by the fixed effect indicator for country *j*, the coefficient β_q multiplied by the interaction between the industry indicator and country-level assets, and the coefficient β_s multiplied by the interaction between the industry indicator and country-level number of employees.

Row #	ISO country code	α_0	β_1* Assets	β_2*Emp	β_k* Industry FE	β_t* Year FE	β_j* Country FE	β_q* Industry FE* Assets	β_s* Industry FE*Emp	*EconNI/ Sale*
1	CAN	0.056	0.005	-0.0004	0.038	-0.012		-0.038	0.000105	0.049
2	AUT	0.056	0.008	-0.0004	0.038	-0.012	-0.005	-0.062	0.000111	0.023
3	BEL	0.056	0.008	-0.0004	0.038	-0.012	-0.014	-0.062	0.000111	0.014
4	BGR	0.056	0.008	-0.0004	0.038	-0.012	-0.039	-0.062	0.000111	-0.011
5	CHE	0.056	0.008	-0.0004	0.038	-0.012	-0.004	-0.062	0.000111	0.023
6-27										
28	RUS	0.056	0.008	-0.0004	0.038	-0.012	0.023	-0.062	0.000111	0.051
29	SVN	0.056	0.008	-0.0004	0.038	-0.012	-0.008	-0.062	0.000111	0.019
30	SWE	0.056	0.008	-0.0004	0.038	-0.012	-0.001	-0.062	0.000111	0.027
31	TUR	0.056	0.008	-0.0004	0.038	-0.012	0.012	-0.062	0.000111	0.039
32	UKR	0.056	0.008	-0.0004	0.038	-0.012	-0.102	-0.062	0.000111	-0.075
33	USA	0.056	0.008	-0.0006	0.038	-0.012		-0.062	0.000170	0.028

Step 4: Calculating domestic and foreign economic earnings proxies

In this step, I aggregate country-level economic net income (*EconNI*) to economic net income at the foreign and domestic levels. I first create *EconNI* by multiplying the country-level economic net income to sales ratio (*EconNI/Sales*) created in Step 3 by country-level sales. I estimate country-level sales by dividing segment sales reported by the number of countries I assigned to that segment. In this example, segment sales for Europe is divided by 31 to estimate sales for each of the countries. Country-level economic net income (*EconNI*) is *EconNI/Sales* multiplied by country-level sales. Next, I create a foreign economic earnings estimate (*EconFIEst*), which is the sum of *EconNI* for Canada and the 31 European countries. I also create a domestic economic earnings estimate (*EconDIEst*), which is the value of *EconNI* for the U.S.

Row #	Country	*EconNI/Sales*	*Segment Sales*	*Country-level Sales*	*EconNI*	*EconFIEst*	*EconDIEst*
1	CAN	0.049	116.94	116.94	5.73	8.87	
2	AUT	0.023	170.27	5.49	0.126	8.87	
3	BEL	0.014	170.27	5.49	0.077	8.87	
4-29							
30	SWE	0.027	170.27	5.49	0.149	8.87	
31	TUR	0.039	170.27	5.49	0.216	8.87	
32	UKR	-0.075	170.27	5.49	-0.411	8.87	
33	USA	0.028	666.66	666.66	18.68		18.68

Step 5: Distributing net income over proportions of economic earnings proxies

I calculate the *EconDI* and *EconFI* values using the calculations in equations (11) and (12) in Section 4.4.2.

datadate	*NI*	*EconFIEst*	*EconDIEst*	*EconFIEst + EconDIEst*	*EconFI*	*EconDI*
31-Dec-04	138.62	8.87	18.68	27.55	44.61	94.01

Step 6: Calculating variables for the regression model

Finally, I divide *EconDI* and *EconFI* by common shares outstanding (cshpri) to get domestic and foreign economic EPS values (*DEEPS*, *FEEPS*). I further divide these variables by lagged price (l1prccq) to get *DEEPS/P* and *FEEPS/P* variables used in regression equation (3) Section 4.2.

datadate	cshpri	l1prccq	*FEEPS*	*DEEPS*	*FEEPS/P*	*DEEPS/P*
31-Dec-04	40.27	37.17	1.11	2.33	0.03	0.06

Appendix F

Replication of Klassen and Laplante (2012a)

Table 1
Replication of Klassen and Laplante (2012a)

FRoS	(1) Original results (Klassen and Laplante (2012a) Table 5 Col (B))	(2) My time period 1998-2018	(3a) Filling in pre-tax domestic and pre-tax foreign values	(3b) Foreign sales using *geotp* value for my segment sample	(3c) My foreign sales measure for my segment sample	(4) (3a) and (3c)	(5) Substituti-ng Fama-French 48 industries for NAICS codes	(6) Final sample	(7) Final sample without fixed effects
RoS	0.501***	0.460***	0.424***	0.583***	0.035***	0.035***	0.031***	0.032***	0.035***
	(0.032)	(0.005)	(0.005)	(0.013)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
HighFTR	-0.007**	-0.015***	-0.013***	-0.013***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001**
	(0.003)	(0.001)	(0.001)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LowFTR*FTR	-0.110***	-0.020***	-0.044***	0.035***	-0.001	-0.000	-0.001	0.000	-0.002
	(0.021)	(0.005)	(0.005)	(0.011)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
HighFTR*FTR	-0.100***	-0.071***	-0.072***	-0.068***	-0.003**	-0.003**	-0.003**	-0.002	-0.003**
	(0.018)	(0.004)	(0.004)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	(not reported)	-0.068	0.062***	0.111**	0.016***	0.254***	0.027***	0.248***	0.003***
		(0.048)	(0.009)	(0.048)	(0.006)	(0.005)	(0.004)	(0.004)	(0.000)
Observations	8,434	11,993	13,903	2,269	2,402	2,402	2,403	1,937	1,937
Adjusted R-squared	0.44	0.587	0.557	0.721	0.988	0.989	0.972	0.985	0.269
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Standard errors are presented in parentheses. ***, and ** represent statistical significance at the 1% and 5% levels, respectively. Column (1) presents the results reported by Klassen and Laplante (2012a). Table 5 Column (B) for their sample period 1988-2009. Column (2) presents the results for my sample's period 1998-2018. Aside from substituting my sample period and data, I modify the original model and measurement in the following ways: (1) filling in pre-tax domestic and pre-tax foreign values following Dyreng and Lyndsey (2009), (2) measuring foreign sales using the foreign classification I develop using geographic segment names rather than the geographic segment indicator available in Compustat, and (3) using Fama-French 48 industry classifications rather than NAICS codes. I incrementally apply each of these changes and present results in columns (3a)-(5). Column (3a) presents results from substituting pre-tax domestic and pre-tax foreign values using the method described by Dyreng and Lyndsey (2009). The sample size increases by 1,905 observations. Column (3b) restricts the sample from column (2) to observations for which I have sufficient geographic segment information for my segment classification but using the segment indicator variable popularly used in the literature (Compustat's *geotp*). Column (3c) presents results for the sample from column (2) using foreign sales values using my geographic segment classification. Column (4) combines the filling in of pre-tax income values and the foreign sales measure. Column (5) substitutes NAICS industry classifications in Klassen and Laplante with Fama-French 48 industry classifications. Column (6) presents results for my final sample for which non-missing data values and removed outliers. Column (7) presents results for the same sample as Column (6), excluding year and industry fixed effects. This result demonstrates that the year and industry fixed effects contribute to an adjusted R^2 of approximately 98% in the four preceding columns.

Appendix G

Replication Tests for Sample and Measure Comparability

Table 1
Replication of Bodnar and Weintrop (1997)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CAR	Results reported by BW (1985-1993)	Replication of BW sample	Robust Regression	Sample period 1998-2018	Augmenting pre-tax and tax values	Assets and market values >$10m	Excluding utilities and financial industries	Non-missing geographic segment data	Removing outliers and missing values
ΔDEPS/P	0.517***	0.594***	0.589***	0.354***	0.344***	0.355***	0.363***	0.408***	0.516***
	(0.062)	(0.114)	(0.077)	(0.024)	(0.024)	(0.017)	(0.017)	(0.055)	(0.066)
ΔFEPS/P	1.235***	1.060***	0.935***	0.543***	0.540***	0.496***	0.486***	0.567***	0.766***
	(0.184)	(0.253)	(0.195)	(0.054)	(0.054)	(0.040)	(0.039)	(0.106)	(0.123)
Constant	0.013	-0.074***	-0.071***	-0.111***	-0.111***	-0.107***	-0.107***	-0.110***	-0.105***
	(0.006)	(0.007)	(0.007)	(0.003)	(0.003)	(0.003)	(0.003)	(0.008)	(0.008)
Observations	2,570	3,616	3,616	18,717	18,897	22,769	22,200	4,997	4,340
Adjusted R-squared	0.068	0.023	0.025	0.018	0.018	0.027	0.029	0.020	0.026

Standard errors are presented in parentheses. *** represents statistical significance at the 1% level. Column (1) presents the results reported by Bodnar and Weintrop (1997) for their sample period 1985 – 1993. I construct a sample closest to that described by them and present this sample's results in column (2). Bodnar and Weintrop remove outliers by calculating Cook's distance for their regression and run a regression with Huber-White robust standard errors. In contrast, I use a robust regression, which handles outliers by calculating Cook's distance in iterations and applies Huber weights followed by biweights. Column (3) presents the results from the robust regression estimation. Column (4) presents results for my sample period 1998-2018. I then replace domestic and foreign pre-tax income and tax values using the replacement method described by Dyreng and Lindsey (2009) (column (5)). I follow prior income shifting literature (e.g., Klassen & Laplante, 2012a,b) in applying size restrictions on firms, which results in lower size restrictions relative to the original sample. Bodnar and Weintrop's sample excluded smaller firms, for which data was unavailable at the time (see Christophe 2002). The lower bound of size criteria for firms is expanded from assets and market value greater than USD 100 million to assets and market value greater than USD 10 million. Results for this sample are presented in column (6). The sample in column (7) excludes industries for which I do not expect to observe income shifting. The sample is further reduced in column (8) to include only those firms with domestic and foreign geographic segment data. Finally, column (9) presents results after removing missing values and outliers in the main regression variables.

Appendix H

Earnings Coefficients Reported in Prior Literature

Table 1

Earnings Valuation Coefficients Reported in Prior Literature and Replication Coefficients

	Bodnar & Weintrop (1997)	Christophe (2002)	Hope, Kang, Thomas, & Vasvari (2008)	Hope, Kang, Thomas, & Vasvari (2009)	Replication
Sample period	1985-1993	1990-1996	1985-2004	1998-2004	1998-2018
DV: CAR					
Δ*TEPS/P*	0.611***	0.947***			0.60***
	(10.63)	(0.083)			(11.16)
Constant	0.012**	0.079***			-0.105***
	(2.051)	(0.018)			(-12.80)
Adjusted R^2	0.061	0.102			0.028
Δ*DEPS/P*	0.517***	0.789***	0.691***	0.578****	0.516***
	(8.376)	(0.096)	(11.15)	(6.85)	(7.82)
Δ*FEPS/P*	1.235***	1.574***	1.390***	0.983***	0.766***
	(6.698)	(0.222)	(8.17)	(8.77)	(6.24)
Constant	0.013**	0.089***	0.093***	-0.113***	-0.105***
	(2.097)	(0.017)	(4.36)	(-5.94)	(-12.84)
Adjusted R^2	0.068	0.105	0.084	0.145	0.026
Observations	2,570	3,041	13,073	3,240	4,340
Year FE	N	Y	Y	Y	N
Industry FE	N	N	Y	N	N
Parentheses	t-stat	std. error	t-stat	t-stat	t-stat

***, and ** represent statistical significance at the 1% and 5% levels, respectively.

Figure 1 – Illustration of the Components of Reported Earnings

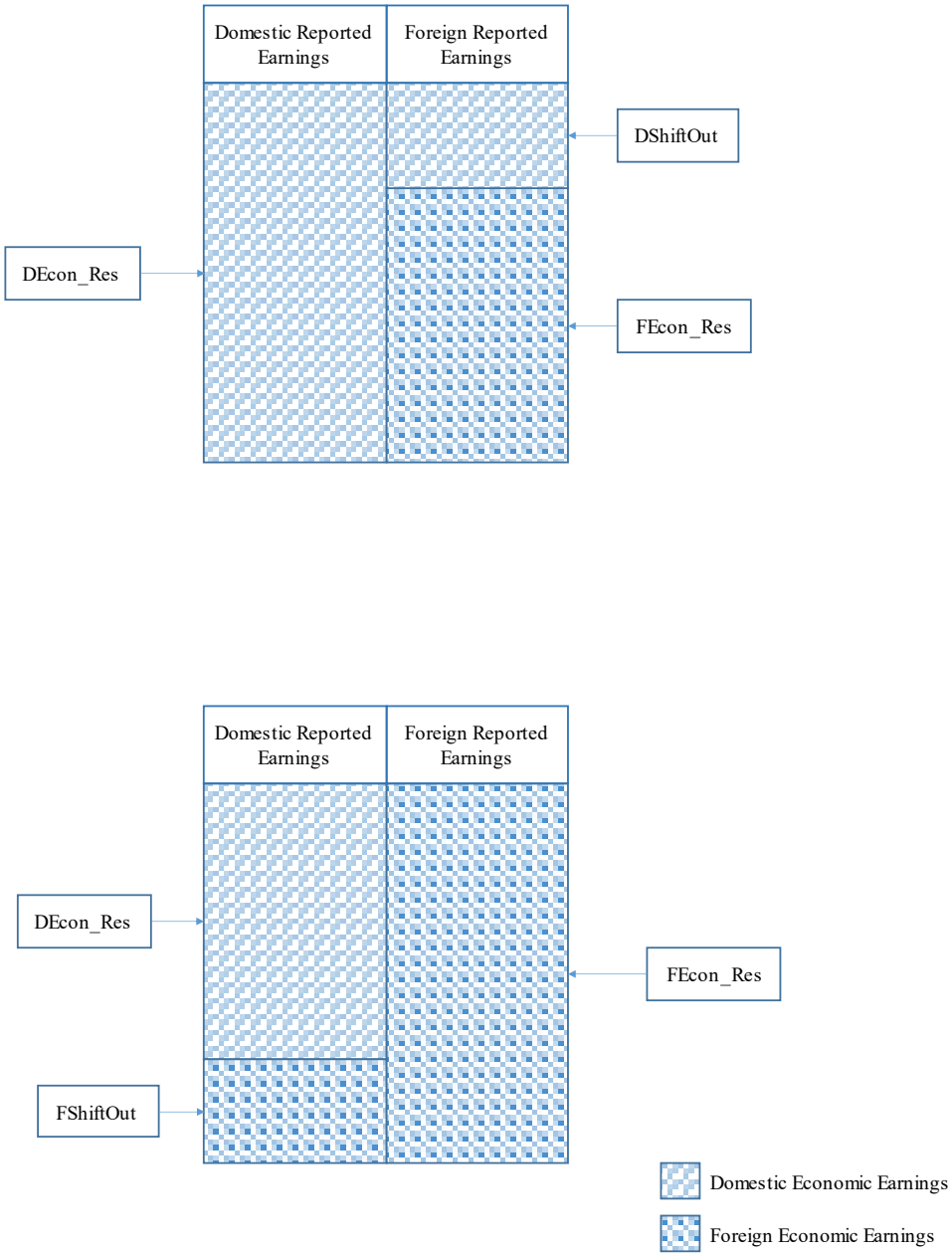
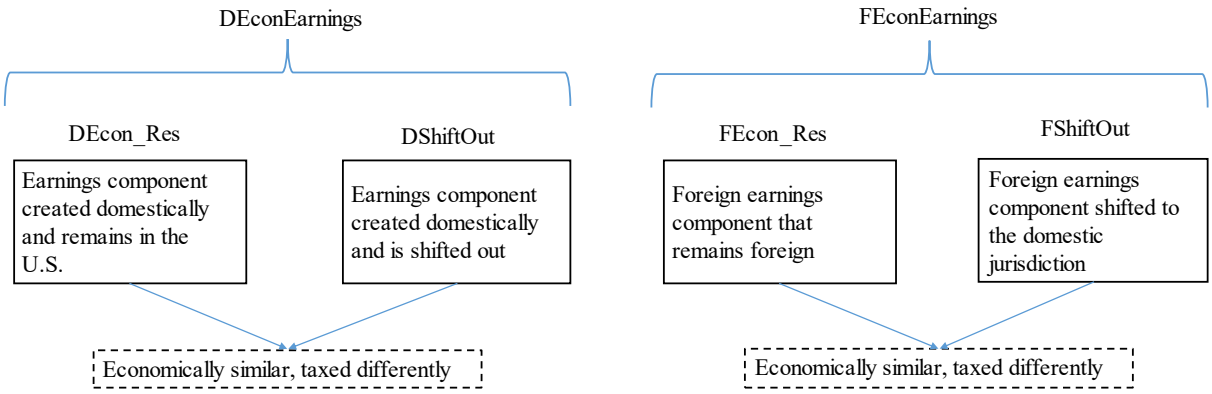


Figure 2 – Illustrating Valuation Similarities and Differences between Earnings Components



Post-shifting

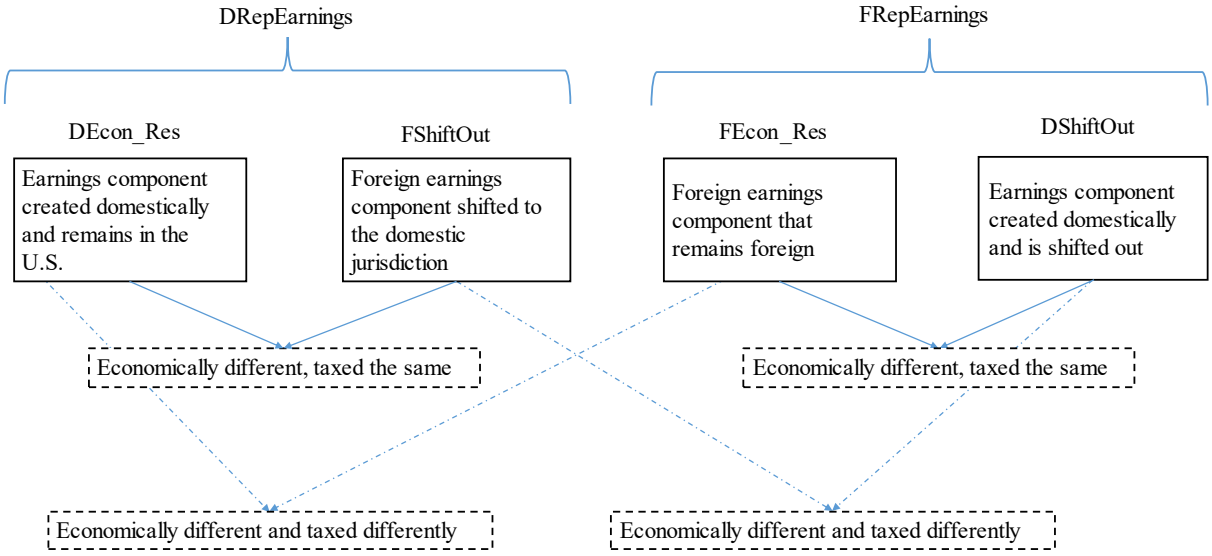


Table 1
Sample Selection

Panel A: Sample selection procedure for U.S. MNCs (Source: Compustat North America)	No. of obs.	No. of firms
Compustat sample for U.S. multinational corporations for fiscal year-ends starting Dec 31, 1998, to Jul 31, 2018 (inclusive)	190,963	19,797
less observations having zero pre-tax foreign income and foreign taxes, after filling in tax values following Dyreng and Lindsey (2009) and applying their criteria to identify MNCs.	-121,126	-13,795
less observations with missing, zero, or negative total assets or sales	-6,331	-56
less observations with insufficient geographic segment data to calculate domestic and foreign economic earnings (see Panel B)	-53,924	-4,232
less observations with missing CRSP returns data to calculate annual CAR	-1,628	-262
less observations with missing employee data	-52	-6
less firms in financial and utilities industries (FF48 codes 31, 44, 45, and 46)	-233	-44
less observations with less than 10 million USD in total assets or market value	-251	-39
less outlying observations less than or greater than four standard deviations from the mean and large Cook's distance in the reported earnings regression	-167	-12
less observations with missing Compustat data to measure changes in total, domestic and foreign EPS	-2,302	-414
less observations with insufficient data to calculate changes in domestic and foreign economic EPS and income shifting	-609	-122
Final sample of U.S. MNCs for fiscal year-ends starting Dec 31, 1998, to Jun 30, 2018 (inclusive)	4,340	815

Panel B: Sample selection procedure for historical segment data for U.S. MNCs (Source: Compustat Historical Segments)	No. of obs.	No. of firms
Firm-year segments with domestic and foreign geographic segments for fiscal years ending Dec 15, 1998, to Jul 31, 2018 (inclusive). (Each observation is a segment line for a given firm in a given year.)	607,781	16,514
less firm-years not present at step 2 in the selection of U.S. MNCs (see Panel A for selection)	-287,051	-10,648
Cleaning segment lines within a segment reported for a given firm-year:		
less firms with total missing or zero assets and employee data	-113,452	-98
less segment lines (observations) with missing or zero assets and employee data	-26,652	0

Identifying and selecting geographic segments based on segment names rather than Compustat's classification:		
less segment lines (observations) with non-geographic segment names	-127,759	-1,711
less segments that have missing values, where multiple segments exist for a given firm-year	-304	0
less operating segments that are miscoded as geographic segments, where multiple segments exist for a given firm-year	-6	0
less observations with negative values for assets, sales or employees	-26	0
less observations with segment names not associated with countries in the domestic-only sample (see Panels C and D)	-965	-3
less segments having only a single segment line with non-zero, non-missing values	-21,276	-2,226
less segments without at least one domestic and one foreign segment line	-2,085	-107
Totals for the sample of U.S. MNCs with segment data (each observation is a segment line. 4,611 firm-years)	28,205	1,721
Assigning segment data to countries and creating foreign and domestic economic earnings		
Expanding firm-year-segment level observations to firm-year-country level observations	305,678	1,721
less operating segments that are miscoded as domestic geographic segment	-10	-4
less outliers under and above four standard deviations from the mean of the country-level economic earnings measure	-123	0
Collapsing from firm-year-country level to firm-year level with at least one domestic and one foreign segment line	-295,920	0
less firm-years with data for only either domestic or foreign economic earnings	-43	-3
Totals merged with main U.S. MNC firm-level data (Panel A)	9,582	1,714

Panel C: Sample selection procedure for domestic-only firms outside the U.S. and Canada (Source: Compustat Global)	No. of obs.	No. of firms	No. of countries
Domestic-only companies on Compustat Global for the sample period	519,346	42,287	110
(Domestic-only firms are identified as those with headquarters located in the country of incorporation and IDBflag!="I")			
less observations with missing, zero, or negative assets and sales (in native currency)	-115,234	-8,013	-6
less observations without currency exchange data from Compustat's currency exchange rate file	-214,610	-4,457	-9
less firms in financial and utilities industries (FF48 codes 31, 44, 45, and 46)	-3,721	-600	-6
less countries with fewer than five domestic-only firms and countries with fewer than 60 observations	-476	-113	-10
Totals for the sample of non-U.S. non-Canadian domestic-only firms	185,305	29,104	79

Panel D: Sample selection procedure for U.S. and Canadian domestic-only firms (Source: Compustat North America)	No. of obs.	No. of firms	No. of countries
U.S. and Canadian domestic-only companies on Compustat North America for the sample period	166,827	20,630	2
(Domestic-only firms are identified as those with headquarters located in the country of incorporation and IDBflag!="D" and zero or missing values of foreign pre-tax income and foreign income taxes)			
less observations with missing, zero, or negative assets and sales (in native currency)	-69,505	-6,189	-
less firms in financial and utilities industries (FF48 codes 31, 44, 45, and 46)	-23,459	-2,752	-
less countries with fewer than five domestic-only firms and countries with fewer than 60 observations	-	-	-
Totals for the sample of U.S. and Canadian domestic-only firms	73,863	11,689	2
Totals for all domestic-only firms (Panels C and D)	259,168	40,793	81

Table 2
Sample Characteristics

Panel A: Industry breakdown (by Fama-French 48 industry names)

Industry code	Industry name	Frequency	Percent	Industry code	Industry name	Frequency	Percent
1	Agriculture	1	0.02	24	Aircraft	11	0.25
2	Food Products	125	2.88	25	Shipbuilding, Railroad Equipment	20	0.46
3	Candy & Soda	30	0.69	26	Defense	2	0.05
4	Beer & Liquor	20	0.46	27	Precious Metals	17	0.39
6	Recreation	32	0.74	28	Non-Metallic and Industrial Metal Min..	41	0.94
7	Entertainment	12	0.28	29	Coal	14	0.32
8	Printing and Publishing	10	0.23	30	Petroleum and Natural Gas	191	4.4
9	Consumer Goods	119	2.74	32	Communication	48	1.11
10	Apparel	79	1.82	33	Personal Services	60	1.38
11	Healthcare	8	0.18	34	Business Services	712	16.41
12	Medical Equipment	175	4.03	35	Computers	114	2.63
13	Pharmaceutical Products	204	4.7	36	Electronic Equipment	365	8.41
14	Chemicals	190	4.38	37	Measuring and Control Equipment	192	4.42
15	Rubber and Plastic Products	55	1.27	38	Business Supplies	72	1.66
16	Textiles	13	0.3	39	Shipping Containers	34	0.78
17	Construction Materials	123	2.83	40	Transportation	85	1.96
18	Construction	34	0.78	41	Wholesale	201	4.63
19	Steel Works	82	1.89	42	Retail	108	2.49
20	Fabricated Products	5	0.12	43	Restaurants, Hotels, Motels	37	0.85
21	Machinery	246	5.67	47	Trading	105	2.42
22	Electrical Equipment	120	2.76	48	Almost Nothing/Other	107	2.47
23	Automobiles and Trucks	121	2.79				
Total						4,340	100

The sample consists of 43 of the 48 Fama-French classified industries.

Panel B: Fiscal-year end breakdown		
Year	Frequency	Percent
1998	74	1.71
1999	249	5.74
2000	225	5.18
2001	209	4.82
2002	198	4.56
2003	202	4.65
2004	215	4.95
2005	222	5.12
2006	225	5.18
2007	233	5.37
2008	227	5.23
2009	222	5.12
2010	218	5.02
2011	234	5.39
2012	237	5.46
2013	228	5.25
2014	237	5.46
2015	228	5.25
2016	215	4.95
2017	210	4.84
2018	32	0.74
Total	4,340	100

Table 3
Sample Descriptives

Panel A: Descriptive Statistics for Sample of U.S. MNCs

Variable	N	Mean	Std. Dev.	Q5	Q25	Q50	Q75	Q95
Assets	4,340	8,072.44	47,586.43	39.51	205.76	806.36	3,400.35	25,262.00
Market Value	4,340	6,283.24	23,986.51	28.48	200.17	826.05	3,280.70	28,170.79
Number of employees	4,340	0.0151	0.0425	0.0002	0.0008	0.0029	0.0100	0.0669
Sales	4,340	4,694.98	13,584.40	37.87	190.26	765.79	3,251.15	21,486.01
Pre-tax domestic income	4,340	135.22	1,402.90	-169.58	-6.16	9.73	89.69	1,103.03
Pre-tax foreign income	4,340	218.20	1,242.68	-23.64	0.80	14.36	95.55	872.71
Pre-tax income	4,340	354.93	2,260.89	-127.91	0.56	34.43	204.36	1,948.92
Net income	4,340	231.72	1,813.72	-135.87	-0.80	22.67	141.30	1,301.50
Domestic net income	4,340	74.77	1,273.68	-181.50	-7.65	6.41	62.34	844.58
Foreign net income	4,340	165.97	1,121.04	-29.03	0.30	9.83	71.15	637.00
Domestic economic earnings	4,340	76.99	762.10	-71.30	-0.25	3.43	29.51	537.52
Foreign economic earnings	4,340	163.76	1,735.29	-85.49	-0.18	7.46	75.06	841.64
Resident portion of domestic economic earnings	4,340	88.00	364.60	0.00	0.00	1.46	19.91	453.12
Shifted out portion of domestic economic earnings	4,340	86.26	1,015.11	0.00	0.00	0.13	13.29	207.62
Resident portion of foreign economic earnings	4,340	151.19	1,076.97	0.00	0.00	2.99	43.66	473.05
Shifted out portion of foreign economic earnings	4,340	84.05	447.89	0.00	0.00	0.00	17.46	330.30

All of the above variables are expressed in millions.

Table 3 (Contd.): Sample Descriptives

Panel B: Descriptive Statistics for EPS transformations of Earnings Components

Variable	N	Mean	Std. Dev.	Q5	Q25	Q50	Q75	Q95
Total EPS *(TEPS)*	4,340	0.974	3.228	-2.150	-0.040	0.840	1.930	4.970
Domestic Reported EPS *(DEPS)*	4,340	0.392	2.668	-2.101	-0.257	0.288	1.131	3.217
Foreign Reported EPS *(FEPS)*	4,340	0.642	1.705	-0.619	0.015	0.301	0.988	3.091
Domestic Economic EPS (*DEEPS)*	4,340	0.435	2.352	-1.235	-0.009	0.093	0.701	3.090
Foreign Economic EPS (*FEEPS)*	4,340	0.599	2.800	-1.373	-0.012	0.268	1.182	3.730
DEcon_Res (EPS)	4,340	0.521	1.407	0.000	0.000	0.049	0.469	2.417
DShiftOut (EPS)	4,340	0.433	1.835	0.000	0.000	0.008	0.340	1.832
FEcon_Res (EPS)	4,340	0.578	1.306	0.000	0.000	0.116	0.701	2.515
FShiftOut (EPS)	4,340	0.389	0.962	0.000	0.000	0.000	0.380	1.787

TEPS is earnings per share (excluding extraordinary items). The remainder of the variables are the earnings components presented in Panel A, each divided by common shares outstanding to get EPS-level variables.

Panel C: Descriptive Statistics for EPS/P transformations of Earnings Components

Variable	N	Mean	Std. Dev.	Q5	Q25	Q50	Q75	Q95
TEPS/P	4,340	0.013	0.181	-0.224	-0.003	0.040	0.071	0.151
DEPS/P	4,340	-0.004	0.135	-0.194	-0.021	0.015	0.045	0.116
FEPS/P	4,340	0.019	0.092	-0.054	0.001	0.016	0.041	0.104
DEEPS/P	4,340	0.007	0.100	-0.101	-0.001	0.004	0.033	0.104
FEEPS/P	4,340	0.008	0.126	-0.122	-0.001	0.014	0.046	0.113
DEcon_Res	4,340	0.020	0.041	0.000	0.000	0.002	0.023	0.090
DShiftOut	4,340	0.026	0.083	0.000	0.000	0.001	0.022	0.123
FEcon_Res	4,340	0.019	0.030	0.000	0.000	0.006	0.027	0.073
FShiftOut	4,340	0.016	0.034	0.000	0.000	0.000	0.017	0.073

EPS-level variables presented in Panel B are each divided by lagged price at the end of the first fiscal quarter.

Table 3 (Contd.): Sample Descriptives

Panel D: Descriptive Statistics for Regression Variables

Variable	N	Mean	Std. Dev.	Q5	Q25	Q50	Q75	Q95
CAR	4,340	-0.081	0.649	-1.070	-0.423	-0.089	0.218	1.004
Δ*TEPS/P*	4,340	0.008	0.153	-0.166	-0.022	0.003	0.030	0.210
Δ*DEPS/P*	4,340	0.004	0.125	-0.136	-0.019	0.000	0.023	0.156
Δ*FEPS/P*	4,340	0.003	0.067	-0.062	-0.008	0.001	0.012	0.077
Δ*DEEPS/P*	4,340	0.003	0.097	-0.102	-0.008	0.000	0.010	0.120
Δ*FEEPS/P*	4,340	0.005	0.110	-0.107	-0.012	0.001	0.018	0.124
Δ*DEcon_Res*	4,340	0.001	0.033	-0.035	-0.002	0.000	0.002	0.045
Δ*DShiftOut*	4,340	0.003	0.071	-0.041	0.000	0.000	0.004	0.060
Δ*FEcon_Res*	4,340	0.002	0.025	-0.028	-0.002	0.000	0.005	0.040
Δ*FShiftOut*	4,340	0.004	0.026	-0.016	0.000	0.000	0.003	0.041

The earnings components presented in this panel are the changes-level variables used in the regressions and are calculated as the annual difference between the EPS/P level variables, presented in Panel C.

Table 4
Correlations Between Regression Variables

	CAR	Δ*TEPS/P*	Δ*DEPS/P*	Δ*FEPS/P*	Δ*DEEPS/P*	Δ*FEEPS/P*	Δ*DEcon_Stay*	Δ*DShiftOut*	Δ*FEcon_Stay*
Δ*TEPS/P*	0.1576 ***								
Δ*DEPS/P*	0.1468 ***	0.8217 ***							
Δ*FEPS/P*	0.1025 ***	0.5245 ***	0.1362 ***						
Δ*DEEPS/P*	0.1239 ***	0.6235 ***	0.6812 ***	0.2398 ***					
Δ*FEEPS/P*	0.1195 ***	0.7010 ***	0.6154 ***	0.5523 ***	0.0375 **				
Δ*DEcon_Stay*	0.1145 ***	0.3363 ***	0.4151 ***	0.1098 ***	0.5058 ***	0.0919 ***			
Δ*DShiftOut*	-0.053 ***	-0.4517 ***	-0.5671 ***	-0.0209	0.0367 **	-0.6869 ***	-0.0333 **		
Δ*FEcon_Stay*	0.0806 ***	0.3368 ***	0.2027 ***	0.4849 ***	0.1127 ***	0.4260 ***	0.2139 ***	-0.1207 ***	
Δ*FShiftOut*	0.0363 **	0.0538 ***	0.1618 ***	-0.1373 ***	-0.1545 ***	0.2355 ***	0.0132	-0.0077	0.0957 ***

Significance levels are reported in parentheses. *,**, and *** represent statistical significance at the 10%, 5%, and 1% levels respectively.

Table 5

Correlations between Reported Earnings and Economic Earnings Proxy for Domestic-only Firms

Panel A: Correlations from Three Sampling Methods

	(1) Randomly selected firm-year in each country	(2) Five randomly selected firm-years in each country	(3) Time-series of randomly selected firm in each country
Correlation coefficient	0.887	0.991	0.054
p-value	0.000	0.000	0.197
Spearman's rho	0.251	0.202	0.232
p-value	0.024	0.000	0.000
n	81	405	581

Panel B: Correlations from Re-sampling Time-series for a Randomly Selected Firm by Country

	(4) Restricting n < 581	(5) Restricting n = 405
Correlation coefficient	0.247	0.028
p-value	0.000	0.577
Spearman's rho	0.243	0.202
p-value	0.000	0.000
n	541	405

Table 6
Income Shifting Validity Check Using Cash ETRs

	(1) CETR	(2) CETR	(3) CETR	(4) CETR5	(5) CETR5	(6) CETR5
DShiftOut (-)	-0.012**		-0.011*	0.004		0.005
	(0.01)		(0.01)	(0.01)		(0.01)
FShiftOut (+)		0.006	0.004		0.001	0.002
		(0.01)	(0.01)		(0.01)	(0.01)
ROA	-0.000**	-0.000**	-0.000**	-0.000***	-0.000***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Lev	0.008	0.009	0.011	0.033	0.037	0.034
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R&D	-0.243***	-0.248***	-0.243***	-0.316***	-0.314***	-0.316***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
NOL	-0.062***	-0.061***	-0.062***	-0.062***	-0.064***	-0.062***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
ΔNOL	-0.029	-0.035	-0.029	-0.013	-0.011	-0.013
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
PP&E	0.036	0.031	0.032	0.149**	0.143**	0.146**
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
INTAN	-0.007	-0.004	-0.006	-0.050**	-0.051**	-0.050**
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
EQINC	-0.370	-0.241	-0.333	0.485	0.439	0.507
	(1.68)	(1.69)	(1.68)	(1.53)	(1.53)	(1.53)
SIZE	0.027***	0.026***	0.026***	0.021***	0.021***	0.021***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BTM	0.005	0.003	0.005	-0.015	-0.013	-0.015
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
INV	-0.306***	-0.300***	-0.292***	-0.015	-0.005	-0.010
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
ADV	0.042	0.036	0.047	-0.213	-0.203	-0.208
	(0.20)	(0.21)	(0.21)	(0.19)	(0.19)	(0.19)
CAPEX	-0.670***	-0.657***	-0.672***	-0.830***	-0.842***	-0.827***
	(0.21)	(0.21)	(0.21)	(0.20)	(0.20)	(0.20)
Constant	0.151	0.085	0.102	0.114	0.098	0.094
	(0.15)	(0.17)	(0.17)	(0.14)	(0.15)	(0.15)
Observations	631	631	631	624	624	624
Adj. R-squared	0.308	0.301	0.305	0.317	0.319	0.317
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors are presented in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. I present expected signs on the income shifting coefficients in parentheses next to the variable names.

Table 7
Income Shifting Validity Check using Klassen and Laplante (2012a) Model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FRoS	5-year average Klassen and Laplante (2012a)	5-year average Klassen and Laplante (2012a)	5-year average Klassen and Laplante (2012a)	1-year Collins et al. (1998)	1-year Collins et al. (1998)	1-year Collins et al. (1998)	5-year average Chen et al. (2018)	5-year average Chen et al. (2018)	5-year average Chen et al. (2018)
RoS	0.032***	0.038***	0.034***	0.027***	0.046***	0.043***	0.033***	0.036***	0.035***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HighFTR (-)	-0.001***		-0.001***	-0.002***		-0.001***			
	(0.000)		(0.000)	(0.000)		(0.000)			
LowFTR*FTR (-)	0.000		0.001	0.001***		0.000*			
	(0.001)		(0.001)	(0.000)		(0.000)			
HighFTR*FTR (-)	-0.002*		-0.002*	-0.000		-0.000			
	(0.001)		(0.001)	(0.000)		(0.000)			
DEconOut/S (+)		0.022***	0.025***		0.069***	0.068***		0.014***	0.003***
		(0.002)	(0.002)		(0.003)	(0.003)		(0.001)	(0.001)
FEconOut/S (-)		-0.020***	-0.009***		-0.036***	-0.032***		-0.005***	-0.004***
		(0.002)	(0.002)		(0.003)	(0.003)		(0.001)	(0.001)
Constant	0.006***	0.004***	0.005***	0.007***	0.003**	0.003***	0.001***	0.002***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	1,937	1,937	1,937	1,932	1,932	1,932	1,935	1,937	1,935
Adjusted R-squared	0.984	0.987	0.988	0.972	0.981	0.982	1.000	1.000	1.000
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Firm FE	No	No	No	No	No	No	Yes	Yes	Yes

Standard errors are presented in parentheses. ***, and * represent statistical significance at the 1% and 10% levels, respectively. I present expected signs on the coefficients in parentheses next to the variable names.

Table 8
Income Shifting Validity Check Using Dyreng and Markle (2016) Model

	(1)		(2)		(3)		(4)	
Outbound Transfers								
θ_0	0.079	***	0.402	***	0.148	***	0.200	***
	(0.026)		(0.086)		(0.026)		(0.034)	
(3) (4)								
θ_{shift} (-) (+)					0.000	***	-0.030	***
					(0.000)		(0.006)	
Inbound Transfers								
γ_0	0.412	***	0.306	*	0.834	***	0.758	***
	(0.062)		(0.170)		(0.026)		(0.035)	
(3) (4)								
γ_{shift} (+) (n.s.)					0.000	***	0.018	***
					(0.000)		(0.004)	
Return on Domestic Sales								
ρ_{d0}	0.079	***	0.036	***	0.040	***	0.087	***
	(0.027)		(0.008)		(0.008)		(0.010)	
ρ_{dshift}					0.000	***	-0.075	***
					(0.000)		(0.010)	
Return on Foreign Sales								
ρ_{f0}	0.145	***	0.031	***	0.035	***	0.088	***
	(0.013)		(0.008)		(0.008)		(0.010)	
ρ_{fshift}					0.000	***	-0.081	***
					(0.000)		(0.010)	
Intercept ΔPIDOM	0.006		0.000		-0.002		-0.002	
	(0.014)		(0.002)		(0.002)		(0.002)	
Intercept ΔPIFO	0.002		0.003	***	0.004	***	0.003	***
	(0.018)		(0.001)		(0.001)		(0.001)	
Adj-R^2 ΔPIDOM	0.045		0.002		0.052		0.032	
Adj-R^2 ΔPIFO	0.089		0.015		0.001		0.006	
Observations	9,385		4,175		4,175		4,175	

Standard errors are presented in parentheses. ***, and * represent statistical significance at the 1% and 10% levels, respectively. Column (1) presents Dyreng & Markle's (2016) results; Column (2) presents results for my sample; Column (3) presents results adding the shifting variable *NetShift_Dom*; and Column (4) presents results adding the shifting variable *DShiftOut*. I present expected signs on the coefficients for the income shifting variables in parentheses next to the coefficient names.

Table 9
Tests of Hypotheses H1a and H1b

CAR	(1)	(2)	(3)	(4)
Δ*DEPS/P*	0.516***	0.593***		
	(0.066)	(0.065)		
Δ*FEPS/P*	0.766***	0.837***		
	(0.123)	(0.120)		
Δ*DEEPS/P*			0.703***	0.778***
			(0.084)	(0.082)
Δ*FEEPS/P*			0.473***	0.530***
			(0.074)	(0.073)
Constant	-0.105***	-0.041	-0.104***	-0.043
	(0.008)	(0.380)	(0.008)	(0.380)
Observations	4,340	4,340	4,340	4,340
Adjusted R-squared	0.026	0.115	0.025	0.114
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
F-test of equality of regression coefficients on:				
Δ*DEPS/P* and Δ*FEPS/P*	2.889	2.920		
Δ*DEEPS/P* and Δ*FEEPS/P*			4.065	4.938
p-value	0.089	0.088	0.044	0.026

Standard errors are provided in parentheses. *** represents statistical significance at the 1% level.

Table 10
Panel A: Tests of Hypotheses H1c and H1d

CAR	(1)	(2)
Δ*DEcon_Res*	1.842***	1.947***
	(0.254)	(0.247)
Δ*DShiftOut*	-0.114	-0.159
	(0.116)	(0.113)
Δ*FEcon_Res*	1.247***	1.472***
	(0.339)	(0.332)
Δ*FShiftOut*	0.398	0.370
	(0.312)	(0.304)
Constant	-0.106***	-0.067
	(0.008)	(0.379)
Observations	4,340	4,340
Adjusted R-squared	0.019	0.105
Year FE	No	Yes
Industry FE	No	Yes

Standard errors are provided in parentheses. *** represents statistical significance at the 1% level.

Panel B: F-tests of Differences Between Coefficients

	(1)			(2)		
	Δ*DEcon_Res*	Δ*DShiftOut*	Δ*FEcon_Res*	Δ*DEcon_Res*	Δ*DShiftOut*	Δ*FEcon_Res*
Δ*DShiftOut*	49.39			60.37		
	0.000			0.000		
Δ*FEcon_Res*	1.64	15.58		1.10	23.12	
	0.200	0.000		0.294	0.000	
Δ*FShiftOut*	12.98	2.37	3.11	16.36	2.65	5.50
	0.000	0.124	0.078	0.000	0.104	0.019

F-test statistics are calculated for coefficients presented in Panel A. Columns (1)-(3) correspond to fixed-effect specifications in columns (1)-(3) in Panel A. p-values are reported below F-stats.

Table 11
Tests of H2a and H2b: Institutional Ownership and the Valuation of Economic Earnings

CAR	(1)	(2)	(3)	(4)
Δ*DEPS/P*	0.679***	0.596***		
	(0.141)	(0.138)		
Δ*FEPS/P*	1.134***	1.046***		
	(0.307)	(0.293)		
High_IIHoldings	-0.053*	-0.005	-0.050*	-0.003
	(0.030)	(0.036)	(0.030)	(0.036)
Δ*DEPS/P X High_IIHoldings*	-0.789***	-0.714***		
	(0.218)	(0.210)		
Δ*FEPS/P X High_IIHoldings*	-0.900*	-0.955*		
	(0.537)	(0.520)		
Δ*DEEPS/P*			0.746***	0.434*
			(0.259)	(0.253)
Δ*FEEPS/P*			0.813***	0.819***
			(0.161)	(0.156)
Δ*DEEPS/P X High_IIHoldings*			-0.662*	-0.323
			(0.367)	(0.356)
Δ*FEEPS/P X High_IIHoldings*			-0.916***	-1.008***
			(0.234)	(0.225)
Constant	-0.112***	-0.248	-0.114***	-0.282
	(0.023)	(0.422)	(0.023)	(0.422)
Observations	867	867	867	867
Adjusted R-squared	0.039	0.131	0.040	0.133
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
F-tests of coefficients				
Δ*DEPS/P X High_IIHoldings* + Δ*DEPS/P*	0.438	0.536		
Δ*DEEPS/P X High_IIHoldings* + Δ*DEEPS/P*			0.106	0.189
p-value	0.508	0.464	0.745	0.664
Δ*FEPS/P X High_IIHoldings* + Δ*FEPS/P*	0.281	0.045		
Δ*FEEPS/P X High_IIHoldings* + Δ*FEEPS/P*			0.369	1.299
p-value	0.596	0.833	0.544	0.255

Standard errors are presented in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 12
Tests of H2c and H2d: Institutional Ownership and the Valuation of Shifted Earnings Components

CAR	(1)	(2)
Δ*DEcon_Res*	1.895**	1.310*
	(0.735)	(0.705)
Δ*DShiftOut*	-0.349	-0.359
	(0.240)	(0.230)
Δ*FEcon_Res*	1.665**	1.712**
	(0.832)	(0.787)
Δ*FShiftOut*	1.121	1.158
	(0.969)	(0.939)
High_IIHoldings	-0.055*	-0.021
	(0.031)	(0.036)
Δ*DEcon_Res X High_IIHoldings*	-1.375	-0.481
	(0.980)	(0.934)
Δ*DShiftOut X High_IIHoldings*	0.825*	1.043**
	(0.438)	(0.421)
Δ*FEcon_Res X High_IIHoldings*	-0.965	-0.732
	(1.107)	(1.065)
Δ*FShiftOut X High_IIHoldings*	-2.800**	-3.103**
	(1.317)	(1.275)
Constant	-0.108***	-0.284
	(0.024)	(0.419)
Observations	867	867
Adjusted R-squared	0.021	0.127
Year FE	No	Yes
Industry FE	No	Yes
F-tests of coefficients		
Δ*DEcon_Res X High_IIHoldings* + Δ*DEcon_Res*	0.645	1.803
p-value	0.422	0.024
Δ*DShiftOut X High_IIHoldings* + Δ*DShiftOut*	1.686	3.718
p-value	0.195	0.169
Δ*FEcon_Res X High_IIHoldings* + Δ*FEcon_Res*	0.918	1.898
p-value	0.338	0.180
Δ*FShiftOut X High_IIHoldings* + Δ*FShiftOut*	3.545	5.121
p-value	0.060	0.054

Standard errors are presented in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 13
Tests of H2e and H2f: Analyst Coverage and the Valuation of Economic Earnings

CAR	(1)	(2)	(3)	(4)
Δ*DEPS/P*	0.514***	0.529***		
	(0.102)	(0.104)		
Δ*FEPS/P*	1.651***	1.694***		
	(0.235)	(0.235)		
High_ACoverage	-0.062**	-0.055**	-0.068***	-0.064**
	(0.024)	(0.027)	(0.024)	(0.027)
Δ*DEPS/P X High_ACoverage*	-0.387*	-0.478**		
	(0.200)	(0.202)		
Δ*FEPS/P X High_ACoverage*	-1.898***	-1.491***		
	(0.529)	(0.533)		
Δ*DEEPS/P*			0.955***	0.955***
			(0.137)	(0.139)
Δ*FEEPS/P*			0.560***	0.570***
			(0.134)	(0.135)
Δ*DEEPS/P X High_ACoverage*			-0.713**	-0.657**
			(0.316)	(0.320)
Δ*FEEPS/P X High_ACoverage*			-0.672***	-0.646***
			(0.233)	(0.236)
Constant	-0.082***	-0.024	-0.076***	-0.035
	(0.016)	(0.372)	(0.016)	(0.372)
Observations	1,743	1,743	1,743	1,743
Adjusted R-squared	0.048	0.114	0.044	0.107
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
F-test of coefficients				
Δ*DEPS/P X High_ACoverage* + Δ*DEPS/P*	0.542	0.086		
p-value	0.462	0.769		
Δ*FEPS/P X High_ACoverage* + Δ*FEPS/P*	0.270	0.180		
p-value	0.603	0.672		
Δ*DEEPS/P X High_ACoverage* + Δ*DEEPS/P*			0.718	1.054
p-value			0.397	0.305
Δ*FEEPS/P X High_ACoverage* + Δ*FEEPS/P*			0.340	0.152
p-value			0.560	0.696

Standard errors are presented in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 14
Tests of H2g and H2h: Analyst Coverage and the Valuation of Shifted Earnings Components

CAR	(1)	(2)
Δ*DEcon_Res*	2.978***	2.981***
	(0.482)	(0.486)
Δ*DShiftOut*	-0.201	-0.171
	(0.203)	(0.205)
Δ*FEcon_Res*	1.274*	1.338**
	(0.672)	(0.681)
Δ*FShiftOut*	-0.203	0.332
	(0.666)	(0.674)
High_ACoverage	-0.074***	-0.075***
	(0.024)	(0.027)
Δ*DEcon_Res X High_ACoverage*	-2.512***	-2.581***
	(0.750)	(0.752)
Δ*DShiftOut X High_ACoverage*	0.799**	0.947**
	(0.373)	(0.377)
Δ*FEcon_Res X High_ACoverage*	-0.510	-0.352
	(1.105)	(1.111)
Δ*FShiftOut X High_ACoverage*	1.295	0.911
	(0.983)	(1.003)
Constant	-0.075***	0.001
	(0.016)	(0.369)
Observations	1,743	1,743
Adjusted R-squared	0.034	0.099
	No	Yes
Year FE	No	Yes
Industry FE	No	No
F-tests of coefficients		
Δ*DEcon_Res X High_ACoverage* + Δ*DEcon_Res*	0.658	0.479
p-value	0.417	0.015
Δ*DShiftOut X High_ACoverage* + Δ*DShiftOut*	3.654	5.979
p-value	0.056	0.097
Δ*FEcon_Res X High_ACoverage* + Δ*FEcon_Res*	0.760	1.232
p-value	0.384	0.267
Δ*FShiftOut X High_ACoverage* + Δ*FShiftOut*	2.277	2.759
p-value	0.131	0.489

Standard errors are presented in parentheses. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.