The Tax Cuts and Jobs Act and Investment Efficiency: The Role of Accounting

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Abstract: This study uses confidential information on foreign affiliate assets to investigate whether the Tax Cuts and Jobs Act of 2017 (TCJA) alleviated investment frictions created by the permanently reinvested earnings (PRE) reported in U.S. multinational corporations' (MNCs) consolidated financial statements. We begin by investigating the repatriation behavior of MNCs surrounding the enactment of the TCJA. Consistent with accounting creating frictions within the MNC, after controlling for the tax liability on the TCJA's deemed repatriation, we document that repatriations were greater for firms with relatively more PRE held in cash. Relatedly, we find that domestic investment by MNCs with above median PRE held in cash is less responsive to domestic investment opportunities and more sensitive to domestic cash flow than other firms before the TCJA relative to after its passage. Overall, our results are consistent with PRE indicating internal capital market frictions which were alleviated after the TCJA.

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1. Introduction

In December of 2017, the U.S. Congress passed the Tax Cuts and Jobs Act (TCJA), legislation that ushered in sweeping changes to how U.S. corporations pay tax on earnings generated abroad. The most dramatic changes were a decrease in the corporate income tax rate from 35 to 21 percent, an increase in bonus depreciation from 50 to 100 percent, and a shift from a worldwide regime to territorial taxation coupled with incentives to invest in the U.S. and disincentives to shift intangibles-based income to low tax countries. The tax bill came in response to the staggering amount of earnings U.S. multinationals had accumulated in foreign subsidiaries, nearly $3 trillion as of 2017 (McKeon 2017), and a desire to entice those funds back into the U.S. economy. These accumulations did not escape the tax they were meant to defer as the TCJA also included a transition tax on deemed repatriation of earnings equal to 15.5% of financial assets and 8% of non-financial assets that had been reinvested abroad.

Initial estimates of the effect of the tax law changes on U.S. investment vary considerably, ranging from insignificant relative to U.S. domestic firms (Beyer et al. 2022) to 4 percent of property plant and equipment relative to non-U.S. multinational corporations (MNCs) (Krull and Wu 2022). Repatriations also fell short of expectations. Early projections predicted U.S. multinationals would repatriate $4 trillion while current estimates put that closer to $1 trillion (Bloomberg 2019). By studying the accounting treatment of the locked-out earnings, we seek to explain the reason for the relatively limited level of post-TCJA repatriations. Specifically, we use confidential data on assets in and repatriations from foreign subsidiaries to construct an estimate of the transition tax on deemed repatriations and cash "trapped" in foreign subsidiaries. We use these estimates to examine the relative importance of tax and financial reporting frictions in repatriation and investment decisions following the TCJA. Specifically, we seek to understand

how the unwinding of tax and financial reporting frictions under the TCJA affect MNCs' repatriation and investment decisions.

This research question is important to understand because identification of tax and financial reporting frictions can help explain why assets were, *and were not*, repatriated and invested in the U.S. following the TCJA. Much of the focus of the popular press and academic literature surrounding the TCJA has been on removal of the tax friction. Yet, prior to the TCJA, the accounting literature identified financial reporting as a friction to repatriation and investment incremental to the repatriation tax (Blouin, Krull, and Robinson 2012a; Graham, Hanlon, and Shevlin 2011). In fact, the literature previously documented that the effect of the financial reporting friction on repatriation was incremental to and as large as the effect of the repatriation tax (Blouin et al. 2012a). This work relies on estimates of the tax paid on reinvested foreign earnings and an assumption that all of those earnings are held in low tax foreign countries.

Moreover, prior to the passage of the TCJA, the press and academic literature largely focused on permanently reinvested earnings (PRE), i.e. book-tax differences predominantly due to unremitted earnings, on which the firm has not immediately accrued the U.S. tax expense on future repatriations, as an estimate of "trapped cash." However, Blouin, Krull, and Robinson (2012b) find that only about one half of PRE is held in cash. The remaining PRE is held in non-financial assets which are less mobile than financial assets. This distinction is important as PRE held as cash likely represents the greatest friction to repatriation and investment, whereas PRE held as non-financial assets more likely represent decisions made for economic, not tax or financial reporting, reasons.

We investigate our research question using confidential data reported by U.S. MNCs to the Bureau of Economic Analysis (BEA). These data report earnings and assets of foreign affiliates

and U.S. MNC parents that meet annual benchmarks, as wells as flows between foreign affiliates and between foreign affiliates and the U.S. parent. Given these data features, we can observe the actual amounts firms repatriated to the U.S. both before and after the TCJA, income taxes paid in the U.S. and abroad, and the composition and location of foreign assets.

We begin by documenting the amount firms repatriated in the years leading up to and following the TCJA, as well as where these repatriations originated. As noted in the popular press and statistics reported by the BEA (York 2018, Herrick 2018), we find a significant jump in repatriations from 2017 to 2018 in our sample. The ratio of dividends to current earnings increases 294% ([(3.51-0.89)/0.89] from Table 1) and repatriations increase $524 billion overall (632.848-108.737 from Table 1). The amount of repatriations decreases in 2019 and 2020, but remains at an elevated rate relative to the pre-TCJA period. In total, repatriations in 2018 to 2020 are $851 billion higher than dividend repatriations in the three years preceding the TCJA, excluding 2017. We disaggregate earnings and repatriations by country regions and country groups using aggregate BEA data (in Table 2) and find that the increase in repatriations is predominately from tax havens.[1] In fact 91.35% of the overall increase is attributable to repatriations from tax havens.

Next, we estimate the transition tax on deemed repatriations – as the TCJA imposes this tax regardless of whether MNCs repatriated their foreign earnings - using reported amounts of financial and non-financial assets in foreign affiliates, measures of unremitted foreign earnings, and estimates of foreign tax credits generated by the deemed repatriations. Following the methodology described by I.R.C. Section 965, we estimate that U.S. MNCs incurred roughly $250 billion in transition tax from the move to the territorial system. This estimate is quite close to the net section IRC Section 965 tax liability of $233.2 billion disclosed by the IRS's Statistics of

[1] We are unable to obtain disclosure clearance for disaggregating earnings and repatriations by country in our sample so we instead do this using aggregate BEA data. The patterns we observe are similar.

Income. Interestingly, the actual tax liability is almost $100 billion lower than the estimate of $338.8 billion published by the Joint Committee on Taxation at the time the TCJA was passed.[2]

To study whether accounting frictions affect MNCs' repatriation and investment activity in response to the TCJA, we follow Blouin et al. (2012b) to estimate the amount of PRE held in financial versus non-financial assets. We combine these estimates with our estimate of the transition tax to examine the extent to which repatriations following the TCJA represent a release of tax versus financial reporting frictions. If MNCs' were making PRE assertions on their unremitted earnings because amounts were needed abroad, then, controlling for the tax frictions, there should be no differential repatriation and investment behavior associated with PRE.

We find that changes in repatriations following the TCJA are positively related to the tax due on deemed repatriations. We also find that PRE held in cash has an incrementally positive effect on repatriations. When we add measures of PRE not held in cash and assets not designated as PRE, we find that only PRE held in cash is incrementally positive. These results confirm that the U.S.'s worldwide system contributed to substantial earnings lock-out. More importantly, we find that accounting frictions related to financial assets have an incrementally positive effect on repatriations. However, non-financial assets are not associated with post-TCJA repatriations, suggesting that these assets, representing about half of PRE, were reinvested due to economic reasons. Overall, our results suggest that PRE assertions on liquid assets were more opportunistic than PRE assertions involving earnings reinvested in non-financial assets.

Next, we turn to the question of investment efficiency. We estimate the change in investment efficiency by regressing a measure of domestic investment on Tobin's q, domestic cash flows, and foreign cash flows (Shin and Stulz 1998). The coefficient on Tobin's q provides a signal

[2] See https://www.jct.gov/publications/2017/jcx-67-17/.

of the firm's ability to take advantage of domestic investment opportunities. A comparison of the coefficients on domestic and foreign cash flows reveals information regarding how freely funds can cross borders to capitalize on investment opportunities. To identify the effect of the TCJA, we estimate this regression separately for pre- and post-TCJA periods. Using dummy variables to partition the sample based on the level of tax frictions (i.e., pre-TCJA foreign tax rate) and financial reporting frictions (PRE held in cash), we study the extent to which changes in investment decisions following the TCJA are due to the release of tax or financial reporting frictions.

We find that MNCs with relatively high levels of PRE held in cash rely more (less) on domestic (foreign) cash flow consistent with internal capital market inefficiency. This inefficiency appears in the pre-TCJA period but dissipates after its passage. We document no such inefficiency associated with tax or accounting frictions in MNCs' foreign operations, consistent with these frictions manifesting themselves asymmetrically in the MNC context.

This paper makes two contributions to the literature. First, we provide detailed information regarding the effect of the TCJA on repatriations and investment and the role of tax and accounting frictions in those decisions. This analysis is important because our work suggests that policy makers and researchers were fixated on the notion that aggregate PRE disclosures represented trapped cash. While prior research examines these effects in a pre-TCJA setting, the unwinding of these frictions as a result of the TCJA provides a powerful setting to identify truly "trapped" assets. To the extent that assets were trapped due to tax and/or financial reporting frictions, firms will repatriate them when the frictions are released. However, for assets that were invested in productive assets, rather than held in financial assets, reinvestment abroad was likely driven by economic factors, not frictions, that were not changed by the TCJA. Thus, our analysis provides

useful information for policy makers as they determine the effects of the TCJA, make projections about its future effects, and consider future changes to the U.S. international tax regime.

We also contribute to research that identifies financial reporting, and in particular, PRE, as a significant deterrent to dividend repatriations from foreign subsidiaries. Pre-TCJA, as PRE increased, dividend repatriations created a disproportionate charge to reported earnings as recognition of the tax expense on repatriations is deferred. Once MNCs repatriate (either deemed or actual), they are hit with a potentially large lump sum charge to tax expense. The TCJA and the related transition tax allows us to observe and control for the true tax effect of PRE to clearly isolate the financial reporting frictions. Results suggest that PRE could be used to estimate the effects of financial reporting on repatriations and, by extension, investment efficiency. PRE's significant role on investment implies that firms were using these assertions opportunistically. Although our work suggests that the investment frictions associated with PRE have dissipated, firms continue to maintain this assertion, though in smaller amounts and less frequently. Despite the elimination of repatriation taxes, PRE remain a significant disclosure for many firms as withholding taxes on permanently reinvested earnings are still deferred.

2. Background and Motivation

2.1 Taxation of U.S. MNC Operations Before and After the TCJA

Prior to the TCJA, the U.S. taxed MNCs' foreign affiliate earnings upon repatriation of the earnings to the U.S. parent. The amount of tax due at the time of repatriation equals the dividend grossed-up for foreign taxes paid times the U.S. statutory tax rate minus a foreign tax credit. Generally, the foreign tax credit equals the amount of foreign income and withholding taxes paid

on the repatriated earnings up to the amount of the U.S. tax liability. If the foreign tax credit is greater than the U.S. tax liability, the MNC owes no incremental tax on repatriation.

After the TCJA, U.S. MNCs are typically not taxed on the earnings of their foreign affiliates that are repatriated to the U.S. These foreign earnings may only be taxed by the U.S. to the extent that they trigger some anti-abuse provision under the tax code. For example, foreign earnings could trigger the Subpart F or the Global Intangible Low Taxed Income (GILTI) regimes. Although the GILTI regime was introduced by the TCJA, the Subpart F regime has been in place since 1962 and was effectively unchanged by recent legislation.

One important aspect of the TCJA for our study is the deemed repatriation under IRC Section 965. Because U.S. MNCs had roughly $3 trillion of unremitted foreign earnings as of 2017, the TCJA stipulated that these earnings should be subject to a one-time tax. Unlike the American Jobs Act of 2004 (AJCA), which provided for a one-time tax holiday on amounts MNCs chose to repatriate, the TCJA requires that all unremitted foreign earnings be taxed as of the end of 2017. To limit liquidity concerns, the tax was payable over the course of eight years. However, there was no element of choice that could affect the tax implications of the deemed repatriation. Effectively, all firms had to pay the deemed repatriation tax regardless of whether they actually intended to repatriate any of the MNCs' foreign earnings.

2.2 What are permanently reinvested earnings (PRE)?

Financial accounting rules require MNCs to recognize, as an expense (and related liability), the anticipated tax consequence related to future repatriation of undistributed foreign earnings in the period those earnings are generated. However, quantifying the expected U.S. tax on

undistributed earnings abroad is complex and requires estimates and assumptions that are susceptible to error or manipulation.[3]

Considering this complexity, Accounting Principles Board Opinion No. 23 (hereafter APB 23) creates an exception to the general rule described above. This exception, the Indefinite Reversal Exception, is now defined in FASB ASC 740 (2009) (formerly FAS 109) and exempts firms from immediate expense recognition if "sufficient evidence shows that the subsidiary has invested or will invest the undistributed earnings indefinitely or that the earnings will be remitted in a tax-free liquidation" (ASC 740-30-25-17).[4]

The Indefinite Reversal Exception is not an 'election' per se, but rather applies if specific facts and circumstances suggest that the earnings will be reinvested outside the U.S. indefinitely. Specifically, the exception states that:

> "A parent entity shall have evidence of specific plans for reinvestment of undistributed earnings of a subsidiary which demonstrate that remittance of the earnings will be postponed indefinitely…Experience of the entities and definite future programs of operations and remittances are examples of the types of evidence required to substantiate the parent entity's representation of indefinite postponement of remittances from a subsidiary." (ASC 740-30-25-17)

In practice, however, these criteria are sufficiently ambiguous such that identical facts and circumstances could lead to different designations of PRE. For instance, Krull (2004) documents that PRE reflects investment and tax incentives, but also finds that amounts reported as PRE are used to manage after-tax earnings.

[3] See e.g., http://www2.financialexecutives.org/news/finrep/letters/Dfdtax_Jun14.pdf (accessed January 7, 2012).

[4] The Indefinite Reversal Exception applies broadly to temporary differences between the tax basis and the financial reporting basis of an investment in the stock of a foreign affiliate (i.e., an outside basis difference). Undistributed earnings of a foreign affiliate increase the book basis of the shares of the affiliate in the hands of the domestic parent and is the most common item giving rise to outside basis differences. Other items, such as differing book and tax bases of shares in a newly acquired foreign target, also give rise to outside basis differences. Because undistributed earnings is the most common item giving rise to outside basis differences, we refer to amounts for which the firm has invoked the Indefinite Reversal Exception as permanently reinvested earnings, or PRE.

Moreover, the Indefinite Reversal Exception operates at the affiliate level; i.e., a parent company need not assert that the undistributed earnings of all foreign affiliates are permanently reinvested to avoid income tax expense recognition. It can apply the exception to some affiliates and not others. It can also apply the exception to each affiliate using a year-by-year, or a dollar-by-dollar approach (Smith 2010).[5] Since firms make PRE designations at the affiliate level but only disclose aggregate PRE across all foreign affiliates, the information conveyed by a firm's disclosure does not reflect the richness of information used to determine the amount of PRE.

While the reporting of PRE has been greatly diminished with the passage of the TCJA, there are firms who still report PRE in their financial statements.[6] Although these MNCs do not owe incremental U.S. income taxes on these foreign earnings, the PRE designation eliminates the requirement to accrue any withholding taxes that would be due on dividend remittances.

3. Hypothesis Development

In the years prior to the TCJA, academics have studied the implications of the U.S.'s system of worldwide taxation and relatively high statutory tax rate on the behavior of U.S. MNCs. Particularly relevant is work that documents that the U.S.'s former tax system led to suboptimal repatriation and investment decisions that in many cases resulted in the build-up of cash held abroad. Foley, Hartzell, Titman and Twite (2006) found that firms that face higher repatriation tax burdens hold higher levels of cash, hold this cash abroad, and hold this cash in affiliates that trigger high tax costs of repatriating earnings. Hanlon, Lester, and Verdi (2015) document that MNCs'

[5] The year-by-year approach means that a firm can change its PRE assertion related to undistributed earnings from a prior period to the extent that facts change over time. The dollar-by-dollar approach means that a firm can assert a portion of the earnings as PRE, while at the same time anticipating a future distribution of the remaining portion. See Apple's pre-TCJA tax footnotes for an example were a firm makes the PRE assertion for only a portion of its foreign earnings.

[6] See Procter & Gamble's 2022 tax footnote.

foreign cash holdings are associated with greater levels of foreign acquisitions in which the market has a more negative market reaction. Harford, Wang and Zhang (2017) document that greater levels of foreign cash result in a larger valuation discount on the firms' cash. This paper also finds evidence that the discount leads to underinvestment in the U.S.

The role of accounting related to foreign operations in MNCs' repatriation and investment decisions has received virtually no attention outside of accounting. Work studying PRE has investigated a series of research questions including whether MNCs manipulate their earnings using the designation (Krull 2004) or are remiss in the reporting of PRE (Ayers, Schwab and Utke 2015). Blouin, Krull and Robinson (2012a) and Graham, Hanlon, and Shevlin (2011) document that the *earnings consequences* of MNCs' tax costs on repatriations reduces repatriations incremental to the tax cost of such repatriations.

Researchers outside of the accounting frequently assert that PRE is simply a measure of foreign cash (e.g., see Ciesielski, 2012; Harford, Wang and Zhang, 2017) as opposed to a distinct financial accounting construct associated with earnings consequences. Our paper illustrates the muti-faceted nature of PRE thereby documenting that work using PRE as foreign cash confounds the role of liquidity and financial reporting on MNC behavior. PRE merely represents the firm's designated book-tax basis difference primarily related to unremitted foreign earnings, and thus there is no reason that PRE is only reinvested in cash held in low-tax jurisdictions. In fact, the SEC questioned some MNCs with large PRE balances about its impact on the firm's domestic liquidity and many responded that they do not face any financing restrictions.[7]

[7] For example, Caterpillar notes in its response to the SEC that, "disclosure of the amount of cash and investments held outside the U.S. is not significant to an understanding of our liquidity" (see above). Caterpillar and many other U.S. MNCs argue with the SEC that the firm can meet its domestic funding needs through other means (such as borrowing) and that significant PRE does not preclude the firm from funding its U.S. operations.

Below, we describe the role of accounting and tax frictions on repatriations and investment. We develop predictions for the two key observables associated with an MNC's internal capital market – repatriations and investment – and how we expect those to change surrounding the TCJA.

3.1 Repatriation Before and After the TCJA

In a U.S. MNC context, existing research finds that repatriations are decreasing in the tax cost of repatriation (Hines and Hubbard 1990; Altshuler and Newlon 1993; Grubert 1998; Desai, Foley, and Hines 2001, 2007) as well as earnings concerns (Blouin et al. 2012; Graham, Hanlon, and Shevlin 2011). If these tax or accounting consequences impede repatriation, then we anticipate a greater pent-up demand for liquidity in MNCs' U.S. operations for firms that have greater amount of their PRE invested in cash. Once the TCJA removes this so-called "earnings lock-out" problem created by the U.S.'s worldwide tax system, we will naturally observe a surge in repatriations.

Of particular interest is how tax and accounting "frictions" are associated with the surge in repatriations. Tax frictions arise due to the pre-TCJA tax on repatriations. Reinvesting, whether in financial or non-financial assets, avoids the tax implications of repatriation. However, mere reinvestment does not avoid the earnings implications. As described in Section 2.2., to avoid the earnings consequence, the firm must make a PRE assertion. If the earnings are eventually repatriated, MNCs with PRE likely face a disproportionately large increase in tax expense.

However, PRE represent the book tax difference on MNCs' investment in foreign subsidiaries, which may stem from opportunistic classifications of unremitted foreign earnings to increase earnings or simply due to the investment of the unremitted earnings into foreign projects (Krull 2004). It is not until the MNC runs out of profitable foreign investment opportunities that it faces agency concerns by holding funds abroad (thereby trapping the cash) or investing sub-optimally to avoid the tax or accounting implications of repatriation. Thus, at least some foreign

investment is due to economic concerns and held in productive non-financial assets. As profitable investments run out and earnings are unremitted due to tax or accounting reasons, they are more likely to be held sub-optimally in financial assets. Thus, all else equal, PRE held in cash are likely associated with greater accounting frictions than PRE held in non-financial assets.Holding constant the tax friction, we anticipate that repatriations will increase more in the presence of an accounting friction.

3.2 Investment Before and After the TCJA

While studies have documented that U.S. MNCs hold high levels of cash; of particular interest is how much of that cash represents foreign cash and how it affects investment at home and abroad. This concern is a question of internal capital market efficiency. The internal capital market literature in finance examines whether firms distribute capital efficiently across segments. Where capital markets operate efficiently, the existence of multiple segments within the same firm can facilitate investment because cash rich segments can finance investments of other segments. Conversely, if the presence of internal capital market frictions, investment by multi-segment firms will be less responsive to investment opportunities with more (less) reliance on its own (other segment's) cash flows (see e.g. Lamont 1997; Shin and Stulz 1998; Ozbas and Scharfstein 2010).

Applying this literature to a multinational context, a U.S. MNC can be viewed as two divisions, or business segments - domestic and foreign. If tax and accounting consequences associated with repatriation impede the mobility of capital *from* the foreign segment *to* the domestic segment, internal capital markets become less efficient. That is, domestic investment will be less responsive to investment opportunities and rely more (less) on domestic (foreign) cash flow. These inefficiencies should not be observed in the foreign segment as capital can flow

relatively freely from the U.S. to the foreign jurisdiction.[8] Once those frictions are released by the TCJA, domestic investment by firms with PRE held in cash should be more responsive to domestic investment opportunities and rely more (less) on foreign (domestic) cash flow.

Ex ante, it is not clear whether the accounting for taxes on unremitted foreign earnings would create investment inefficiencies incremental to the cash tax due on repatriations. If MNCs are making PRE designations because either they expect to need the assets to invest abroad or they'd prefer not to pay the U.S. repatriation tax *and* the MNC faces no domestic liquidity constraints, there should be no incremental accounting-induced investment inefficiency. However, if firms are making the PRE designations to smooth earnings, then the PRE designation could exacerbate domestic underinvestment. As argued previously, these pre-TCJA internal market inefficiencies should be present in firms with greater levels of PRE held in cash because they have the greatest accounting friction. Alternatively, if PRE firms have extensive liquidity options available to finance domestic investment, then we would instead observe that domestic investment is more or similarly responsive to domestic investment opportunities and less or similarly responsive to domestic cash flow for these firms. For example, because only approximately one third of PRE represents MNCs' foreign cash, many MNCs could have financed their domestic operation with non-PRE cash. [9]

3.3 Hypothesis

An MNC's repatriation and investment decisions at home and abroad collectively characterize its internal capital market in the presence of a domestic and foreign segment. As

[8] Because there are no current tax frictions for using the domestic operations of a MNC to fund its foreign operations, we expect that MNCs do not face constraints on funding their foreign investment opportunities.
[9] See Section 4.2 below for additional details. In addition, MNCs were permitted to have loans of up to 90 days from their foreign affiliates. See the details of HP lending outlines in its 2012 testimony to the Senate Permanent Subcommittee on Investigations.

explained above, when there are large tax costs of repatriating foreign earnings, MNCs may be unwilling to repatriate their foreign cash to fund domestic investment.[10] Relatedly, the buildup of foreign cash can also impact foreign investment. We are interested in whether accounting incentives are associated with investment inefficiency. Controlling for the tax cost of repatriation and the resulting investment inefficiencies at home and abroad, we study accounting's role.

The TCJA provides a unique opportunity to explore the role of accounting in repatriation and investment decisions because it eliminated the tax cost of repatriating future earnings for *all* firms and imposed a tax cost on *all* firms for existing earnings. This was the most radical change in the taxation of foreign earnings in decades. Furthermore, the tax cost was a function of whether an MNC held financial or non-financial assets but did not vary according to the MNC's accounting conventions (i.e., PRE designations) which only impacted the MNC's accounting earnings. The hypothesis that we test, stated in the null, is as follows:

Accounting had no impact on U.S. MNCs' internal capital markets surrounding the TCJA.

4. Data and Sample Selection

4.1 BEA Data

To obtain information on assets held in specific foreign affiliates of U.S. MNCs, as well as data on the domestic operations of each MNC, we use confidential data from the Annual (Benchmark) Survey of U.S. Direct Investment Abroad conducted by the BEA. Federal law

[10] Repatriations act as the direct mechanism by which foreign cash ultimately funds domestic investment. But to the extent that a MNC's foreign operations invest in relatively poor projects (i.e., overinvestment), domestic borrowing may also be constrained due to the ability of the domestic parent to pledge 66.66% of its foreign subsidiaries' stock as collateral for domestic borrowing. If the foreign operations underperform, then the domestic borrowing capacity could be reduced.

obligates U.S. MNCs to report financial and operating data for both domestic and foreign operations to the BEA for the purpose of producing aggregate statistics on U.S. direct investment abroad.[11] The amount of data collected by the BEA varies by year and depends on whether the affiliate meets a reporting threshold; thresholds in benchmark years (i.e., 1999, 2004, 2009, 2014, and 2019) are lower so the information is more complete.[12] In addition, the BEA collects quarterly earnings and dividends in a survey of U.S. Direct Investment Abroad. These latter surveys only include activity of affiliates that are directly held by a U.S. entity.[13] As such, the dividends on this survey represents earnings that have been repatriated to the U.S.

To analyze U.S. MNC repatriation behavior, we investigate the earnings and dividends of US MNCs' directly-owned foreign affiliates. The activity of directly-owned affiliates includes the activity of indirectly-owned affiliates. As such, the earnings and repatriations of the top level of affiliates represent the economic ramifications of all of the US MNCs' foreign operations.

For the investment tests, we utilize information on MNCs foreign and domestic investment and cash flows. When necessary, we aggregate domestic and foreign assets within each MNC to compute worldwide assets. MNCs report to the BEA on a fiscal year basis and follow U.S. Generally Accepted Accounting Principles (GAAP), except for consolidation rules. Whereas GAAP requires consolidation for equity investments of more than 50 percent, the BEA requires that the MNC use the equity method of accounting for all equity investments. This means that we

[11] The BEA defines a U.S. MNC as the combination of a single U.S. entity, called the U.S. parent, and at least one foreign affiliate in which the U.S. parent holds, directly or indirectly, a ten percent interest. However, only a small proportion of affiliates in our sample are owned less than 100 percent.

[12] In order to reduce the reporting burden, the BEA requires the filing of a survey form for an affiliate if its assets, sales, or net income (loss) exceed $7 million in 1999, $30 million in 2000-2003, $10 million in 2004, and $40 million in 2005-2008. During 2000-2003, and 2005-2008 (i.e., non-benchmark years), some of the financial and operating data that we observe for small affiliates not required to participate in the survey is estimated by the BEA.

[13] These data are collected quarterly on Form BE-577 and contain only information on flows between the directly-owned foreign affiliate and U.S. parent. There is no balance sheet information. Note the same penalties for non-filing apply.

can cleanly separate the assets of a parent company from the assets of its affiliates. The intercompany investment account also allows us to avoid double-counting assets in the consolidation process.[14]

In addition, some MNCs' foreign affiliates are owned by other foreign affiliates either instead of, or in conjunction with, the U.S. parent. When we observe these tiered ownership structures, we focus on the financial position of the lower-tier entities (and do not attribute the financial positions of a lower-tier entity to its owner). For instance, when an affiliate is directly owned by another affiliate, the assets of the lower-tier entity are considered in our analysis and the proportion of the upper-tier entity's assets attributable to the lower-tier entity are removed from the upper-tier. The BEA data provides information on ownership structures, as well as intercompany investment accounts, allowing us to make these adjustments.

4.2 Estimating PRE Cash, Non-Cash PRE and Non-PRE Assets

We follow the methodology described in Blouin, Krull and Robinson (2012b) to partition PRE into its cash and noncash components. We begin by collecting PRE from Audit Analytics or by hand from MNCs' 10-Ks for all BEA firms that have a Compustat GVKEY for 1998 until 2016. Then, we estimate the following equation by year:

$$PRE_{i,t} = \beta_0 + \beta_1 Total\ Foreign\ Assets_{i,t} + \beta_2 Cash\ Foreign\ Assets_{i,t} + \varepsilon_{i,t} \quad (1)$$

Total Foreign Assets equals affiliates' total assets less investments in subsidiaries. *Cash Foreign Assets* equals the affiliates' foreign assets held in the form of cash. All variables are scaled by worldwide assets. We utilize the annual coefficient estimates to determine the amount of PRE

[14] For example, under the equity method of accounting used for BEA reporting, the total assets of the domestic operation will include the 'net assets' or equity investment in all foreign affiliates. Thus, a measure of worldwide assets necessitates that we remove the investment in foreign affiliates from domestic assets, and instead include aggregate total assets of foreign affiliates with domestic assets. This mimics the result that would be achieved if the MNCs assets were consolidated under GAAP. Total assets computed using BEA data and total assets in Compustat are highly correlated (p = 0.998).

associated with cash versus non-cash assets for each sample MNC. The coefficients in Equation (1) estimate how the level of PRE changes as assets in affiliates vary. The coefficient on *Total Foreign Assets* (β_1) represents the change in the level of PRE as total assets change by one dollar, and β_2 represents the change in the level of PRE as foreign cash changes by one dollar, incremental to the effect of total assets. We estimate Non-PRE Assets as Total Foreign Assets less PRE Assets in year t.

4.3 Sample

We construct two samples for our analyses. First, we estimate the change in dividend repatriations and the origin of those repatriations. We conduct these analyses at the affiliate level and begin with the sample of affiliates that report positive dividend repatriations on BE Form 577 from 2008 through 2020. To ensure that we only capture publicly traded multinational corporations, we match this sample to Compustat, excluding REITs, banks, insurance and foreign-owned entities, using a combination of fuzzy matching and hand matching.

Second, we estimate the repatriation and investment implications of PRE held in cash. To conduct this analysis we require information on assets held in specific foreign affiliates of U.S. MNCs, as well as data on the domestic operations of each MNC. As we are interested in the effects of the Tax Cuts and Jobs Act of 2017, we limit our sample to the seven-year period surrounding the Act (2014 to 2020). Finally, we merge these data with PRE information collected either from Audit Analytics or by hand. After eliminating observations with missing data, our final sample contains 3,911 firm-years (1,177 MNCs).

4.4 Descriptive Data on Earnings and Dividend Repatriations Over Time

Table 1 Panel A provides statistics on the earnings and repatriations of our sample from 2008 to 2020. We observe a striking increase in repatriations beginning in 2018 consistent with

the US's repeal of the worldwide tax system. Specifically, we find that repatriations increase by 481 percent or $524 billion in 2018, while earnings increase by 47 percent or $57 billion. We further find that dividend repatriation decreases in 2019 and 2020 relative to 2018 but remain higher than the pre-TCJA period. Relative to 2018, repatriations decrease by 51% or $322 billion in 2019 and 67% or $422 billion in 2020. Relative to 2017, repatriations remain 185% and 93% higher in 2019 and 2020, respectively. As a percentage of earnings, repatriation increase from 89% in 2017 to 351% in 2018, then decrease to 172% and 155% in 2019 and 2020, respectively.

Table 2 reports earnings and repatriations by country of origin from 2008 through 2020. Due to disclosure limitations, these data come from the Balance of Payments and Direct Investment Position Data publicly provided by the BEA. Although dividends were not separately reported by the BEA until 2017, estimates of dividend remittances can be computed as the difference between Direct Investment Income Without Current-Cost Adjustment and Reinvestment of Earnings Without Current-Cost Adjustment.[15] We provide a comparison of repatriation activity in three-year periods and across several country groups including the G7, Europe, Asia Pacific, Havens and other. Note that the Europe and Asia Pacific categories exclude countries included in the G7 or Havens.[16]

Panel A reports the aggregate earnings and repatriations reported in the Direct Investment Position data. Total earnings for these firms show a general increasing trend over the period. Over

[15] Note that the difference between Income and Reinvested Earnings actually includes dividends (i.e., repatriations) and net interest remitted to the U.S. However, over the sample period, net interest is relatively immaterial (roughly 1% to 5% of direct investment income depending upon the year). Note that when we compared the estimate repatriations to repatriations reported by the BEA for 2017 to 2021, our estimated repatriations are on average 4% higher than BEA reported repatriations. Interestingly, for 2018, our estimated repatriations are only 0.8% higher than BEA reported amounts.

[16] Haven countries include Ireland, Netherlands, Switzerland, Luxembourg, Singapore, Malaysia, Hong Kong, UK Caribbean, Trinidad and Tobago, Panama, Bahamas, Bermuda, Dominican Republic, Barbados, Netherlands Antilles.

the sample period, total earnings have increased approximately 30%. However, there has been a 250% increase in repatriations over the same period.

Panel B reports earnings and repatriations by country group for each three-year time period. Notice that total earnings and repatriations reported in Europe actually decreased by 24% and 35%, respectively, from the 2008-2010 to 2018-2020 time periods. Although earnings reported in Havens increased by 66% over the sample periods, repatriations increased by 592%. Effectively, the majority of the increase in repatriations in the post-TCJA period stem from Havens. Total dividends in the 2018-2020 period are $1.588 trillion with $1.234 trillion coming from tax havens.

When investing the ratios of repatriations to earnings, we see steady increases across the geographic regions with the exception of Europe. The ratio of total repatriations to total earnings is increases from 39.47% in 2008-2010, to 37.69% in 2014-2016, and 105.38% in 2018-2020. Tax havens see the largest increase over time with the ratio increasing from 30.20% in 2008-2010, to 28.12% in 2014-2016, and 105.38% in 2018-2020.

5. Research Design

5.1 Did Accounting Frictions Affect Repatriations Surrounding the TCJA?

We examine MNCs' repatriation responses to the TCJA by estimating the following regression: the accounting friction is represented by *PREcash*:

$$Repatriations_{i,t} = \alpha_0 + \alpha_1 TaxDue_{i,t} + \alpha_2 PREcash_{i,t} + \alpha_3 Post_t + \alpha_4 TaxDue_{i,t} * Post\ TCJA_t + \alpha_5 PREcash_{i,t} * Post\ TCJA_t + \Sigma\alpha_k Control_k + \Sigma\alpha_t Year_t + \Sigma\alpha_j Industry_j \quad (2)$$

Where:

Repatriations = current-year repatriations from foreign affiliates scaled by worldwide assets,
TaxDue = An estimate of the transition tax on deemed repatriations as described in Appendix B, scaled by worldwide assets,
PREcash = An estimate of PRE held in cash in 2016 as described in Section 4.2, scaled by worldwide assets,

Post TCJA = A dummy variable equal to 1 for years 2018, 2019, and 2020, and zero otherwise
Control = A vector of control variables

We estimate Equation (1) from 2014 through 2020, excluding 2017. The coefficient on *TaxDue* captures the effect of taxes on repatriations. We expect the coefficient on *TaxDue* to be negative because a larger tax due implies that less earnings have been repatriated and/or a higher tax would be due upon repatriation, a deterrent to repatriation. The coefficient on *PREcash* is a measure of financial reporting frictions. We expect the coefficient on *PREcash* to be negative, because higher PREcash implies that less earnings were repatriated and is associated with higher financial reporting costs of repatriations. We separately interact both *TaxDue* and *PREcash* with *Post TCJA* to estimate how these frictions affect firms' responses to the TCJA. We expect the coefficient on *TaxDue*Post TCJA* to be positive. A higher value of *TaxDue* suggests that there were higher tax costs of repatriation before the TCJA and therefore a larger response to the TJCA as those frictions are released. If accounting frictions are incremental to tax frictions, we expect the coefficient on *PREcash*Post* to be positive.

We include several control variables that existing research finds to be significant determinants of dividend repatriations. *LagRepatriations* equals *Repatriations* in year t-1 scaled by worldwide assets in year t-1. This variable controls for the stickiness of dividend repatriations over time and we expect a positive coefficient on this variable. Foreign return on assets (*FROA*) and U.S. return on assets (*USROA*) control for investment opportunities abroad and in the U.S. as firms will invest in the jurisdiction with the highest after-tax return (Hartman 1985). Both *FROA* and *USROA* are calculated as net income scaled by operating assets in those respective jurisdictions. This effect suggests a negative coefficient on *FROA* and a positive coefficient on *USROA*. However, a higher *FROA* (*USROA*) suggests that there are more funds available to repatriate (invest in the U.S.) suggesting a positive coefficient on *FROA* and a negative coefficient

on *USROA*. Thus, we do not predict a sign for these coefficients. *Leverage* controls for debt servicing needs, and *Size* controls for the size of foreign operations as firms with larger foreign operations have more funds available to repatriate suggesting a positive coefficient on this variable.

5.2 Did Accounting Frictions Affect Investment Surrounding the TCJA?

Early studies in corporate finance document the relationship between investment and liquidity by estimating the following model using panel data (e.g., Hoshi, Kashyap, and Scharfstein 1991): $I/K_{i,t} = \gamma 0 + \gamma 1 Q_{i,t} + \gamma 2 CF/K_{i,t} + \sum \gamma k Year_k + \sum \gamma j Industry_j + \varepsilon_{i,t}$. For each business segment, *I* is investment, *K* is capital stock at the beginning of the period, *Q* is Tobin's Q, and *CF* is a measure of cash flow. Studies that examine the efficiency of firms' internal capital markets also adopt this model (e.g., Lamont 1997; Shin and Stulz 1998; Ozbas and Scharfstein 2010). The maintained hypothesis in the literature is that external capital markets are imperfect and that internal capital markets play a nontrivial role in allocating capital. An efficient internal capital market would ensure that each segment invests regardless of its own cash flow if it has valuable investment opportunities. Thus, these studies interpret differences in $\gamma 1$ and $\gamma 2$ across segments that represent part of a diversified versus a stand-alone firm as evidence on internal capital market efficiency.

We adopt this framework in our empirical tests. Following Shin and Stulz (1998) we decompose a firm's total cash flows into a segment's own cash flow (i.e., domestic cash flow) and the cash flow of other segments (i.e., foreign cash flow). We therefore model the investment of the domestic segment as a function of its investment opportunities, its own

cash flow, the cash flow of the foreign segment, and control variables.[17] To examine the presence of tax and accounting frictions in MNCs' internal capital markets, we interact each of these variables with *Attribute* as follows (this approach allows the coefficients γ_1, and γ_2, and γ_3 to vary across firms with high tax and/or accounting frictions):[23]

$$\begin{aligned} \textit{Domestic Investment}_{i,t} = {} & \gamma_0 + \gamma_1 \textit{Domestic } Q_{i,t} + \gamma_2 \textit{Domestic } CF_{i,t} \\ & + \gamma_3 \textit{Foreign } CF_{i,t} + \gamma_4 \textit{Domestic } Q_{i,t} * \textit{Attribute}_{i,t} \\ & + \gamma_5 \textit{Domestic } CF_{i,t} * \textit{Attribute}_{i,t} + \gamma_6 \textit{Foreign } CF_{i,t} * \textit{Attribute}_{i,t} \\ & + \gamma_7 \textit{Domestic Size}_{i,t} + \gamma_8 \textit{Foreign Size}_{i,t} \\ & + \gamma_9 \textit{Mature}_{i,t} + \gamma_{10} \textit{Qdum}_{i,t} + \gamma_{11} \textit{Leverage}_{i,t} + \sum \gamma_k \text{Year}_k + \varepsilon_{i,t} \end{aligned} \quad (3)$$

In the presence of internal capital market frictions, an MNC would operate its domestic segment largely independently of its foreign segment. In the extreme case of total independence, we should observe two empirical patterns in the data: (i) the investment of the domestic segment should be less responsive to investment opportunities (Shin and Stulz 1998) and (ii) the domestic segment should rely more on its own cash flow than it does on the cash flow of the foreign segment to finance investment (Lamont 1997). As the friction is asymmetric, we would not expect to observe these patterns in the foreign segment. Tax and accounting frictions prevent foreign capital from being used for domestic investment, but do not (directly) prevent domestic capital from being used for foreign investment.[18] For this reason, we also estimate Equation (3) replacing *Domestic Investment* and *Domestic Q* with *Foreign Investment* and *Foreign Q*.

Domestic Investment is domestic R&D and capital expenditures scaled by domestic assets. *Domestic Q,* our proxy for investment opportunities, is mean U.S. sales growth in

[17] Consistent with existing studies, we include year fixed effects and cluster standard errors by firm. We do not include industry fixed effects because we measure Q as industry sales growth as in Harford et al. (2017) and thus industry fixed effects limit our ability to detect the investment sensitivity to investment opportunities in our model.
[18] However, there may be indirect effects related attributable to a reduction in outbound profit shifting when the domestic operations face financial constraints. See Dyreng and Markle (2016).

each firms' primary industry over the previous three years. *Domestic CF* is domestic net income plus R&D and depreciation scaled by domestic assets. *Foreign CF* is foreign net income plus R&D and depreciation scaled by foreign assets.[19] *Attribute* represents MNC partitions based on the presence of tax frictions (*LowFTCrate*) and accounting frictions (*HighPREcash*). If *Attribute* identifies MNCs whose tax and accounting frictions create internal capital market inefficiencies, then domestic investment in these MNCs will be relatively less related to domestic investment opportunities and relatively more (less) reliant on domestic (foreign) cash flow. To examine MNCs' investment responses surrounding the TCJA we estimate Equation (3) in the three years prior to the TCJA and the three years after the TCJA. Prior to the TCJA, we anticipate internal capital market inefficiencies in the domestic but not the foreign segment. After the TJCA, we do not anticipate finding evidence of internal capital market inefficiencies in either segment.

We include several additional control variables. *Domestic Size* is the log of domestic sales, and *Foreign Size* is the log of foreign sales. Firms with larger domestic operations may make smaller investments if their domestic operations are relatively more mature. Similarly, firms with larger foreign operations may require less investment abroad if foreign operations are relatively more mature, leaving more available for domestic investment (see Desai, Foley and Hines 2009). *Mature* is the log of the number of years since the firm made its first foreign direct investment and controls for the possibility that firms that have been abroad longer invest less because they are more mature firms. *Qdum* equals 1 when *Domestic Q* is greater than *Foreign Q*, and 0 otherwise. Firms should invest more (less) in domestic operations when *Domestic Q* is higher (lower) than *Foreign Q*. *Leverage* is the ratio of short- and long-

[19] These measures are consistent with those in Shin and Stulz (1998) and Ozbas and Scharfstein (2010), adapted to include R&D in domestic investment.

term debt to total assets. Firms with greater external borrowing may invest less if they are more constrained.

6. Regression Results

6.1 Repatriations Surrounding the TCJA

Table 3 reports descriptive data for the variables included in Equation (2). Mean *Repatriations* is 0.8 percent of worldwide assets. Mean *TaxDue* is 1.3 percent of worldwide assets and mean *PREcash* is 5.3 percent of worldwide assets. The relative means of PREcash and PRE suggests that *PREcash* is about 34 percent of total PRE in our sample.

Table 4 reports the results of estimating Equation (2). We first replicate the empirical model from Blouin, Krull, and Robinson (2012a) by replacing *TaxDue* in Equation (2) with *FTCrate*, equal to foreign taxes paid on total unremitted earnings divided by total unremitted earnings, and report the results in Column (1).[20] We find that the coefficient on *FTCrate* is positive and significant, but the coefficient on *PREcash* is not significantly different from zero. However, the coefficient on *FTCrate*Post TCJA* is negative and significant and the coefficient on *PREcash*Post TCJA* is positive and significant as expected. These results suggest that PRE held in cash has an incremental effect on changes in repatriations in response to the TCJA, over and above that of the foreign tax credit.

Column (2) reports the results of estimating Equation (2) with *TaxDue* as an estimate of the tax frictions. The coefficients on *TaxDue* and *PREcash* are both insignificant. However, the coefficients on *TaxDue*Post TCJA* and *PREcash*Post TCJA* are both positive and significant.

[20] This is a slight modification to Blouin, Krull, and Robinson (2012a) as they take 35% minus the *FTCrate*. We eliminate this step to account for the change in the U.S. tax rate enacted by the TCJA. This modification reverses the expected sigh on *FTCrate*.

These results suggest that the release of both tax and financial reporting frictions as a result of the TCJA is associated with the increase in repatriations following the legislation. Moreover, these results suggest that the effect of financial reporting frictions is incremental to that of tax frictions, consistent with our prediction.

In Column (3) we replace *PREcash* with *PRE*, total PRE divided by worldwide assets. The coefficient on *TaxDue*Post TCJA* remains positive and significant and the coefficient on *PRE*Post TCJA* is also positive and significant. This result suggests that aggregate PRE acts as an investment friction consistent with the results Blouin, Krull and Robinson (2012a). In Column (4) we include *PREcash* (not *PRE*) and add PRE that is held in noncash assets (*NonCashPRE = PRE - PREcash*) and non-PRE assets (*NonPREasset = Total Foreign Assets – PRE*). We find only the interaction of *PREcash*Post TCJA* is positive and significant. The coefficient on *NonCashPRE* is not significantly different from zero and the coefficient on *NonPREasset*Post TCJA* is negative and significant. These results are consistent with *PREcash* having the highest financial reporting cost that was released by the TCJA.

6.2 Investment Surrounding the TCJA

Table 5 reports descriptive data for the variables included in Equation (3). In our sample of 3,911 firm-years surrounding the TCJA, the mean investment, sales growth (our proxy for Q), and cash flow of the domestic segment exceed that of the foreign segment, despite the foreign segment being larger. However, the lower foreign investment could also be consistent with U.S. MNCs having cash trapped abroad. Any declining foreign investment could also be consistent with the earnings lock-out due to the U.S.'s worldwide taxation.

Table 6 reports the results of estimating Equation (3). Panel A shows results examining potential frictions within the domestic segment of the MNC while Panel B show results

examining the foreign segment. Column (1) of Panel A reports results for the full sample period from 2014 through 2020 (excluding 2017) with no interaction terms. These results show that domestic investment is generally responsive to domestic investment opportunities (*Domestic Q*) but reliant more (less) on domestic (foreign) cash flow, suggesting the presence of some internal capital market inefficiencies overall.

Columns (2) and (3) of Panel A report results separately for the pre-TCJA period (2014-2016) and the post-TCJA period (2018-2020). In the pre-TCJA period, domestic investment relies significantly more (less) on domestic (foreign) cash flow. There is a lesser (greater) reliance on domestic (foreign) cash flow in the post-TCJA period. These same columns in Panel B show that foreign investment is more (less) reliant on foreign (domestic) cash flow but that this pattern does not change as significantly after the TJCA. These initial results support the notion that the frictions we described earlier were asymmetric. That is, the change pre v. post TCJA in Panel A versus Panel B likely stems from the release of the tax and/or accounting frictions surrounding the passage of the TCJA.

To test whether the disparate cash flow sensitivities are related to the accounting and tax frictions we described earlier, we append the model to include indicator variables that capture these frictions. In columns (4) and (5) of Panel A, we interact investment opportunities, the segment's own cash flow and the cash flow of other segments with our proxy for accounting friction, *HighPREcash*. *HighPREcash* equals 1 if the MNC has above the median in PRE held in cash as a function of worldwide assets in 2016 (the year immediately preceding enactment of the TCJA). In Column (4), we show that greater (lesser) reliance on domestic (foreign) cash flow documented in Column (2) is concentrated in the sample with greater amounts of PRE held in cash. In Column (5), after the TCJA, the pattern document in firms with large amounts of PRE

held in cash dissipates. In this post-TCJA period, domestic investment of all firms is sensitive to investment opportunities and more (less) reliant on domestic (foreign) cash. Thus, while we document some investment inefficiencies in both the pre- and post-TCJA period in Panel A, our results suggest that the accounting expense associated with generating earnings contributed to suboptimal investment on the behalf of U.S. MNCs. This conclusion is further supported by those same columns in Panel B examining foreign investment not documenting these changing patterns.

Another explanation for the link between *PREcash* and investment inefficiencies could simply be that the PRE measure is capturing the tax friction created by the U.S.'s worldwide system. If PRE is predominantly held in cash in relatively lightly taxed jurisdictions, then out measure could be simply capturing tax-induced trapped cash. To rule out this alternative explanation for our results, we include a *LowFTCrate* indicator that equals 1 when the estimated foreign tax rate paid on MNCs' foreign operations is below the median. If the change in the investment efficiency that we are observing stems from the cash flow implications related to repatriation taxes, then *LowFTCrate* could also lead to changes in investment behavior.

In columns (6) and (7) of Panel A, we interact investment opportunities, the segment's own cash flow and the cash flow of other segments with *LowFTCrate* in the pre-TCJA and post-TCJA periods, respectively. We find that investment is more efficient in the post-TCJA period but that there is no significant difference in firms with high versus low FTC rates. In particular, in the post-TCJA period, domestic investment is (less) more sensitive to domestic (foreign) cash flow relative to the pre-TCJA period. Domestic investment is also sensitive to domestic investment opportunities. This suggests that while investment efficiency overall improved after the TCJA, this change appears to be unrelated to our proxy for the tax friction. In Columns (8) and (9), when we include interactions terms using both *HighPREcash* and *LowFTCrate* in the model

simultaneously, the accounting friction is more consequential than the tax friction with respect to changes in investment efficiency surrounding the TCJA. Again, we note that these changes in investment efficiency associated with the release of tax and/or accounting frictions are not observed in Panel B with respect to foreign investment.

7. Concluding Remarks

The TCJA was a very significant change in the taxation of U.S. MNCs' operations. Many policy makers had intended for the TCJA to lead to $3 to $4 trillion of the accumulated foreign profits of MNCs to be brought back into the U.S. This $3 to $4 trillion represents the PRE firms disclosed in their publicly available financial statements. Unfortunately, many had simply misunderstood the implications of PRE on firm value, liquidity, and the effects of tax reform. PRE are foreign affiliate earnings for which a firm has not recognized a residual U.S. tax expense, if any, due upon repatriation of those earnings. In practice, firms report the aggregate amount of PRE across all foreign affiliates and seldom report the expected tax liability associated with its repatriation to the U.S. It turns out that not all PRE provides a signal regarding trapped cash held abroad in low-tax jurisdictions.

Our study combines firm-level amounts reported as PRE with confidential affiliate-level data from legally mandated federal surveys of U.S. MNCs to learn about the role of accounting and tax frictions on investment efficiency. We make two key observations. First, we find PRE held in cash represented a significant friction to repatriation and investment in U.S. firms prior to the TCJA. In fact, we confirm the findings from the existing literature that this friction was incremental to, and in some cases more significant than, the tax friction represented by the pre-TCJA repatriation tax. Second, we examine investment efficiency after the TCJA and find that the release of the accounting friction was more consequential than the tax friction in improving internal capital

market efficiencies within MNCs. Our analysis provides useful information for policy makers as they determine the effects of the TCJA, make projections about its future effects, and consider future changes to the U.S. international tax regime.

APPENDIX A – VARIABLE DEFINITIONS

Variables	Definition
Repatriations	Repatriations from directly-owned affiliates as reported on BE-577, Quarterly Survey of U.S. Direct Investment Abroad
Earnings	Earnings reported from directly-owned affiliates as reported on BE-577, Quarterly Survey of U.S. Direct Investment Abroad
PRE	PRE collected either by hand or from Audit Analytics
Total Foreign Assets	Total foreign operating assets which is estimated as total foreign assets less investment in foreign subsidiaries reported on BE-10/11, Annual Survey of U.S. Direct Investment Abroad
Cash Foreign Assets	Total foreign cash reported on BE-10/11, Annual Survey of U.S. Direct Investment Abroad
PREcash	PRE held in cash estimated using the coefficients from equation (1)
NonCashPRE	PRE - PREcash
NonPREasset	Total Foreign Assets - PRE
Domestic Investment	U.S. capital expenditures and research and development expenditures scaled by domestic operating assets (total domestic assets less investment in foreign subsidiaries) as reported on BE 10/11
Foreign Investment	Foreign capital expenditures and research and development expenditures scaled by foreign operating assets (total foreign assets less investment in foreign subsidiaries) as reported on BE 10/11
TaxDue	The estimated tax due on the deemed repatriation as described in Appendix B
FTCrate	The estimated cumulated foreign taxes paid divided by cumulated pretax income as described in Appendix B
LagRepatriations	Repatriations from directly-owned affiliates as reported on BE-577 for period t - 1
FROA	Foreign return on assets is foreign net income scaled by foreign operating assets (total foreign assets less investment in foreign subsidiaries) as reported on BE 10/11
USROA	U.S. return on assets is U.S. net income scaled by U.S. operating assets (total domestic assets less investment in foreign subsidiaries) as reported on BE 10/11
Domestic Q	Lagged domestic sales growth by four-digit NAICS industry using sales as reported on BE 10/11

Foreign Q	Lagged foreign sales growth by country-four-digit NAICS code. For MNCs operating in multiple countries, each country-industry sales growth is weighted by each foreign affiliate's assets. This measure uses sales as reported on BE 10/11
Domestic CF	Domestic net income plus depreciation and research and development scaled by domestic operating assets using amounts reported on BE 10/11
Foreign CF	Foreign net income plus depreciation and research and development scaled by foreign operating assets using amounts reported on BE 10/11
Size	The log of worldwide sales using amounts from BE 10/11
Domestic Size	The log of domestic sales using amounts from BE 10/11
Foreign Size	The log of foreign sales using amounts from BE 10/11
Mature	The number of years the MNC has appeared in the BEA data as of 2020
Qdum	An indicator variable equal to 1 if Domestic Q > Foreign Q, 0 otherwise.
Leverage	Leverage is long-term debt divided by worldwide assets from Compustat.
HighPREcash	An indicator variable equal to 1 when an MNC's PREcash scaled by worldwide assets is above the sample median in 2016, and 0 otherwise.
LowFTCrate	An indicator variable equal to 1 when an MNC's FTCRate is below the sample median in 2016, and 0 otherwise.
Post TCJA	An indicator variable equal to 1 when the year is greater than 2017, and 0 if less than 2017 (the year 2017 is excluded from the analysis)

APPENDIX B – DETAILS OF THE COMPUTATION OF THE DEEMED REPATRIATION TAX

We begin by estimating each affiliate's earnings and profits pool and creditable taxes. We accumulate each affiliate's earnings and foreign taxes beginning when the affiliate is first reported to the BEA. As our data begins in 1982, we assume that the pool of tax credits in existence as of the end of 1981 is at the same rate of tax the affiliate reports in 1982.[21] Then, for each year, we add current period pre-tax income and subtract dividends paid (repatriations) from the prior period's pre-tax income to obtain estimate of each affiliate's undistributed pre-tax income at the end of each year. We aggregate each affiliate's tax expense and undistributed pre-tax income over time beginning with the date the affiliate is first included in the BEA survey or 1982 (the first BEA survey), whichever comes last, and ending at the end of year t-1. This process results in an estimate of each affiliates cumulative taxes paid on undistributed pre-tax income (CTP) and cumulative undistributed pre-tax income (CUPTI). *FTCrate* for year t equals year t-1 CTP divided by year t-1 CUPTI.

Next, we separate the loss affiliates (i.e., those affiliates where CUPTI < 0) from the affiliates with positive CUPTI and sum the loss and profit affiliates for each MNC. We then allocate the aggregate losses across all positive CUPTI affiliates to determine the portion of the CTP that would be included in the pool of potential foreign tax credits. Basically, MNCs are required to allocate their losses evenly over all affiliates with positive accumulated earnings so as to reduce the pool of potential tax credits pro rata across countries with high and low foreign tax rates.

As the deemed repatriation tax has a different rate for cash and non-cash assets, we determine whether the portion of each affiliate's assets comprised of cash. Rules require the MNC

[21] So if the opening retained earnings of an affiliate is $100 and the tax rate in 1982 is 40%, we assume the tax in the $100 pool of earnings is $66.67 (i.e., 100/(1-t)).

to estimate the cash portion of its deemed repatriation tax to be computed on either their aggregate 2017 cash balance or the average of 2015 and 2016 cash, whichever was higher. The portion of the MNC's pool subject to tax at 15.5% is this aggregate amount of cash. The cash amount is subtracted from the CUPTI after the loss allocation to determine the amount of accumulated unremitted foreign earnings subject to the 8% tax.

The ratio of the aggregate cash (residual assets) to the CUPTI provides the portion of the MNC's foreign tax pool available for credit towards the 15.5% (8%) tax. The foreign tax credit is reduced accordingly to ensure that MNCs owe some repatriation tax if they are paying a foreign tax rate less than 35%. For example, for a MNC with $10 in accumulated E&P in a country with a 10% tax rate, would owe $1.23 if all of its accumulate earnings was held in cash.[22] To compute TaxDue we estimate the deemed repatriation tax due for each MNC using all of its affiliates in the BEA data for the 2016 year.

[22] Of the $10 of accumulated earnings held in cash 15.5/35 = 44.286% would be subject to the deemed repatriation tax. Assuming that the $10 of accumulated earnings represented $11.11 of pretax earnings and a $1.11 of foreign taxes, the MNC would report $4.92 subject to U.S. tax at 35% or $1.72. The MNC would be allowed $0.49 in foreign tax credit so it would owe $1.23 in U.S. tax.

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TABLE 1 – U.S. PARENT REPATRIATIONS AND EARNINGS

Year	N	Earnings from Directly Owned Foreign Affiliates	Repatriations from Directly Owned Affiliates	Ratio of Repatriations to Earnings (4)/(3)
(1)	(2)	(3)	(4)	(5)
2008	1,175	129,890	115,075	0.89
2009	1,562	126,771	105,290	0.83
2010	1,191	137,252	103,280	0.75
2011	1,191	142,581	99,750	0.70
2012	1,084	127,169	113,150	0.89
2013	1,055	109,755	77,741	0.71
2014	1,197	154,281	107,713	0.70
2015	1,055	116,470	98,980	0.85
2016	1,039	112,057	95,756	0.85
2017	1,128	122,283	108,737	0.89
2018	1,261	180,244	632,848	3.51
2019	1,005	180,283	310,715	1.72
2020	977	135,985	210,341	1.55

This table includes aggregate earnings and repatriations from directly-owned foreign affiliates collected from the BEA Form 577, Quarterly Survey of U.S. Direct Investment Abroad. Amounts are columns (3) and (4) are in USD millions. N represents the number of repatriating U.S. multinational groups included in these statistics. Directly-owned foreign affiliates represents the foreign affiliates that are directly owned by a U.S.-domiciled entity.

TABLE 2 – AGGREGATE REPATRIATIONS AND EARNINGS BY GEOGRAPHIC REGION

	2008-2010 (1)	**2011-2013** (2)	**2014-2016** (3)	**2018-2020** (4)	**2018-2020/ 2014-2016** (5)
Panel A: Aggregate					
Total Repatriations	454,160	484,922	498,062	1,588,487	3.189
Total Earnings	1,150,598	1,335,214	1,321,403	1,507,358	1.141
Total Rep/Earnings	39.47%	36.32%	37.69%	105.38%	
Panel B: By Geographic Region					
G7 Repatriations	105,043	107,977	103,762	161,569	1.557
Europe Repatriations	63,768	44,629	29,560	41,606	1.408
Asia Pacific Repatriations	39,824	42,295	57,431	65,973	1.149
Haven Repatriations	178,364	204,181	237,904	1,233,980	5.187
Other Repatriations	67,161	85,840	69,405	85,359	1.230
G7 Earnings	219,366	242,681	244,146	269,234	1.103
Europe Earnings	93,551	71,672	36,420	71,011	1.950
Asia Pacific Earnings	96,114	108,224	98,049	94,326	0.962
Haven Earnings	590,581	742,102	845,940	980,433	1.159
Other Earnings	150,986	170,535	96,848	92,354	0.956
G7 Rep/Earnings	47.88%	44.49%	42.50%	60.01%	
Europe Rep/Earnings	68.16%	62.27%	81.16%	58.59%	
Asia Rep/Earnings	41.43%	39.08%	58.57%	69.94%	
Haven Rep/Earnings	30.20%	27.51%	28.12%	125.86%	
Other Rep/Earnings	44.48%	50.34%	71.66%	92.43%	

This table includes aggregate earnings and repatriations from directly-owned foreign affiliates collected from the BEA Form 577 partitioned by geography. Repatriations and earnings represents amounts from directly-owned foreign affiliates. Amounts in USD millions except for the Rep/Earnings which represent the ratio of repatriations to earnings. G7 represents the non-U.S. countries in the Group of Seven (Germany, Canada, France, U.K., Italy and Japan). Europe includes EU countries not in one of the other categories. Asia Pacific represents all Asia and Pacific Rim countries not included in G7 or Havens. Haven represents Switzerland, Ireland, Luxembourg, Netherlands, Hong Kong, Malaysia, Singapore, Netherlands Antilles, Bahamas, Panama, Barbados, Bermuda, Trinidad and Tobago, Dominican Republic, and UK Islands – Caribbean. Other represents all other countries. Directly-owned foreign affiliates represents the foreign affiliates that are directly owned by a U.S.-domiciled entity.

TABLE 3 – DESCRIPTIVE DATA FOR MULTIVARIATE TESTS OF REPATRIATION BEHAVIOR

Variable	N	Mean	STD
Repatriations	3,911	0.008	0.028
FTCRate	3,911	0.210	0.258
TaxDue	3,911	0.013	0.020
PRE	3,911	0.152	0.177
PREcash	3,911	0.053	0.084
NonCashPRE	3,911	0.100	0.106
NonPREassets	3,911	0.420	0.572
Post TCJA	3,911	0.533	0.008
LagRepatriations	3,911	0.006	0.023
FROA	3,911	0.017	0.052
USROA	3,911	0.050	0.090
Leverage	3,911	0.282	0.196
Size	3,911	7.017	1.862

This table provides the univariate statistics for the 3,911 MNC-year observations used in the multivariate analysis in Table 4. The observations are from 2014, 2015, 2016, 2018, 2019, and 2020. See Appendix A for variable definitions. Repatriations, TaxDue, PRE, PREcash, NonCashPRE, NonPREassets, LagRepatriations are all scaled by worldwide assets.

TABLE 4 – THE TCJA AND THE ROLE OF PRE ON REPATRIATIONS

Dependent Variable = Repatriations	(1)	(2)	(3)	(4)
FTCrate	0.003**			
	(0.001)			
TaxDue		0.014	0.011	0.001
		(0.037)	(0.040)	(0.042)
PRE			0.003	
			(0.003)	
PREcash	0.008	0.007		0.002
	(0.005)	(0.006)		(0.007)
NonCashPRE				0.023
				(0.015)
NonPREasset				-0.003
				(0.002)
FTCRate*Post TCJA	-0.007**			
	(0.003)			
TaxDue*Post TCJA		0.101***	0.101***	0.104***
		(0.006)	(0.007)	(0.007)
PRE*Post TCJA			0.0160**	
			(0.007)	
PREcash*Post TCJA	0.046***	0.037**		0.040**
	(0.016)	(0.016)		(0.019)
NonCashPRE*Post TCJA				0.043
				(0.028)
NonPREasset*Post TCJA				-0.009**
				(0.005)
LagRepatriations	0.579***	0.540***	0.540***	0.528***
	(0.056)	(0.054)	(0.054)	(0.054)
FROA	0.047***	0.047***	0.047***	0.045***
	(0.014)	(0.014)	(0.014)	(0.013)

USROA	0.021***	0.019***	0.019***	0.016***
	(0.005)	(0.005)	(0.005)	(0.005)
Leverage	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Size	0.000	0.001**	0.001**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
N	3,911	3,911	3,911	3,911
R-Sq	0.3275	0.3503	0.3496	0.3563

This table reports the coefficients and standard errors. All standard errors are clustered by MNC. See Appendix A for variable definitions. Repatriations, TaxDue, PRE, PREcash, NonCashPRE, NonPREasset, LagRepatriations are all scaled by worldwide assets. ***(**) amounts represent significance at the 1% (5%) level using two-tailed tests.

TABLE 5 - DESCRIPTIVE DATA FOR MULTIVARIATE TESTS OF INVESTMENT EFFICIENCY

Variable	N	Mean	STD
Domestic Investment	3,911	0.090	0.003
Foreign Investment	3,911	0.032	0.001
Domestic Q	3,911	0.081	0.002
Foreign Q	3,911	0.061	0.001
Domestic CF	3,911	0.160	0.006
Foreign CF	3,911	0.070	0.002
Domestic Size	3,911	5.321	0.056
Foreign Size	3,911	7.017	0.030
Mature	3,911	1.116	0.002
Qdum	3,911	0.560	0.008
Leverage	3,911	0.282	0.003
Post TCJA	3,911	0.533	0.008
HighPREcash	3,911	0.452	0.008
LowFTCrate	3,911	0.406	0.008

This table provides the univariate statistics for the 3,911 MNC-year observations used in the multivariate analysis in Table 6. The observations are from 2014, 2015, 2016, 2018, 2019, and 2020. See Appendix A for variable definitions.

TABLE 6 - THE TCJA AND THE ROLE OF ACCOUNTING FRICTIONS ON INVESTMENT EFFICIENCY

PANEL A: DOMESTIC INVESTMENT

Dependent Variable = Domestic Investment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Domestic Q	0.078**	0.058	0.072	0.047	0.102*	0.055	0.127*	0.049	0.143**
	(0.032)	(0.043)	(0.061)	(0.033)	(0.057)	(0.050)	(0.070)	(0.056)	(0.069)
Domestic CF	0.263***	0.344***	0.173***	0.090	0.194***	0.365***	0.154***	0.072	0.184***
	(0.029)	(0.043)	(0.027)	(0.069)	(0.046)	(0.045)	(0.003)	(0.084)	(0.048)
Foreign CF	-0.023	-0.093**	0.007	0.052	-0.001	-0.182**	0.082***	0.006	-0.006
	(0.016)	(0.046)	(0.014)	(0.036)	(0.014)	(0.073)	(0.018)	(0.066)	(0.017)
HighPREcash*Domestic Q				0.007	-0.122			0.005	-0.083
				(0.061)	(0.106)			(0.066)	(0.102)
HighPREcash*Domestic CF				0.302***	-0.032			0.309***	-0.054
				(0.075)	(0.055)			(0.078)	(0.058)
HighPREcash*Foreign CF				-0.370***	0.033			-0.372***	0.021
				(0.108)	(0.047)			(0.109)	(0.046)
LowFTCrate*Domestic Q						-0.002	-0.132	0.008	-0.131*
						(0.063)	(0.082)	(0.065)	(0.077)
LowFTCrate*Domestic CF						-0.035	0.057	0.020	0.073
						(0.075)	(0.049)	(0.059)	(0.052)
LowFTCrate*Foreign CF						0.120	0.016	0.059	0.012
						(0.089)	(0.034)	(0.079)	(0.032)
Time Period	Full	Before	After	Before	After	Before	After	Before	After
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,911	1,826	2,085	1,826	2,085	1,826	2,085	1,826	2,085
R-Sq	0.364	0.481	0.232	0.533	0.236	0.483	0.239	0.533	0.245

This table reports the coefficients and standard errors from estimating Equation (3). All standard errors are clustered by MNC. The full time period is from 2014 through 2020, excluding 2017. The before time period is prior to the TCJA from 2014 to 2016. The after time period is after the TCJA from 2018 to 2020. See Appendix A for variable definitions. We suppress the coefficients on the control variables Domestic Size, Foreign Size, Mature, Qdum, and Leverage. ***(**) amounts represent significance at the 1% (5%) level using two-tailed tests.

TABLE 6 - THE TCJA AND THE ROLE OF ACCOUNTING FRICTIONS ON INVESTMENT EFFICIENCY (CONT.)

PANEL B: FOREIGN INVESTMENT

Dependent Variable = Foreign Investment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Foreign Q	0.001	-0.007	0.025	0.005	0.023	-0.009	0.012	0.001	0.012
	(0.017)	(0.017)	(0.028)	(0.023)	(0.032)	(0.023)	(0.024)	(0.030)	(0.026)
Domestic CF	-0.003	-0.004	-0.003	0.007	0.002	-0.006*	-0.002	0.006	0.002
	(0.002)	(0.003)	(0.003)	(0.009)	(0.005)	(0.004)	(0.003)	(0.010)	(0.005)
Foreign CF	0.121***	0.208***	0.094***	0.213***	0.087***	0.249***	0.082***	0.256***	0.078***
	(0.018)	(0.029)	(0.016)	(0.038)	(0.018)	(0.037)	(0.018)	(0.024)	(0.024)
HighPREcash*Foreign Q				-0.020	-0.002			-0.019	-0.005
				(0.026)	(0.033)			(0.027)	(0.035)
HighPREcash*Domestic CF				-0.012	-0.008			-0.012	-0.008
				(0.009)	(0.006)			(0.010)	(0.006)
HighPREcash*Foreign CF				-0.019	0.034			-0.022	0.026
				(0.047)	(0.040)			(0.047)	(0.043)
LowFTCrate*Foreign Q						0.009	0.028	0.010	0.026
						(0.027)	(0.043)	(0.027)	(0.044)
LowFTCrate*Domestic CF						0.004	-0.002	0.002	0.000
						(0.005)	(0.007)	(0.005)	(0.007)
LowFTCrate*Foreign CF						-0.054	0.027	-0.054	0.023
						(0.049)	(0.034)	(0.048)	(0.038)
Time Period	Full	Before	After	Before	After	Before	After	Before	After
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,911	1,826	2,085	1,826	2,085	1,826	2,085	1,826	2,085
R-Sq	0.116	0.201	0.093	0.204	0.095	0.204	0.096	0.207	0.097

This table reports the coefficients and standard errors from estimating Equation (3). All standard errors are clustered by MNC. The full time period is from 2014 through 2020, excluding 2017. The before time period is prior to the TCJA from 2014 to 2016. The after time period is after the TCJA from 2018 to 2020. See Appendix A for variable definitions. We suppress the coefficients on the control variables Domestic Size, Foreign Size, Mature, Qdum, and Leverage. ***(**) amounts represent significance at the 1% (5%) level using two-tailed tests.