

Repatriation Taxes and Affiliate-level Investment Decisions

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Abstract

This paper examines the effect of repatriation taxes on the investment decisions made by foreign subsidiaries of multinational corporations (MNCs). Using a global sample, we provide evidence that a subsidiary's investment behavior is less aligned with local growth opportunities when its parent faces repatriation taxes on its earnings. This negative effect of repatriation taxes on investment efficiency is weaker when the parent monitors the subsidiary more closely, consistent with an agency costs explanation. Similarly, the effect is weaker when the parent has a stronger need for the subsidiary's earnings to be repatriated. We confirm our results and establish a causal relationship using natural experiments in the U.K. and Japan, which both eliminated repatriation taxes from their international tax systems in 2009. Our results suggest that repatriation taxes distort internal capital markets and reinforce agency conflicts within MNCs, leading to economically less efficient investment decisions at the affiliate level.

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1. Introduction

Taxes levied on the repatriation of foreign income represent a tax friction in the internal capital market of a multinational corporation (MNC) and result in cash being kept in the foreign subsidiary instead of being returned to the parent as a dividend (Foley, Hartzell, Titman, & Twite, 2007; Beyer, Downes, & Rapley, 2017; Laplante & Nesbitt, 2017). Prior research shows that U.S. MNCs use this “trapped” foreign cash to engage in value-decreasing foreign merger and acquisition (M&A) activity and offers two explanations for this observed behavior. First, Hanlon, Lester, & Verdi (2015) offer an agency cost explanation, which assumes that the tax-induced excess cash provides the CEO with the opportunity to make economically suboptimal M&A. Edwards, Kravet, & Wilson (2016), on the other hand, suggest that lower-return acquisitions made with the tax-induced excess cash are actually economically optimal for the MNC as a whole because investing the pre-repatriation-tax earnings abroad leads to a higher return than investing the after-repatriation-tax earnings domestically. We extend this stream of research by examining whether repatriation taxes affect the efficiency of *affiliate*-level investment and by determining whether agency costs are driving the effect.

Distinct from prior research, we examine the subsidiary-level investment decisions made by the manager of the foreign subsidiary. These decisions may be affected by agency conflicts between the parent’s central management and the foreign affiliate’s local management, while the M&A transactions studied previously are subject to agency conflicts between shareholders and the parent’s central management. As repatriation taxes increase the foreign subsidiary’s free cash flow, we predict that the affiliate’s manager has the opportunity and the incentive to reap personal benefits by expanding foreign operations beyond their optimal size (Jensen, 1986; Harford, 1999). As such, repatriation taxes may represent a specific source of agency conflicts that lead to

inefficient subsidiary-level investment.

We use data from Bureau van Dijk's Orbis database for the years 2007 to 2014 to construct a sample of affiliates based in 37 countries, whose parents are located in 56 countries. We first confirm that repatriation taxes lead to higher foreign cash holdings in our sample, consistent with prior research (Foley et al., 2007). We then test whether repatriation taxes impair the efficiency of investment by regressing subsidiary-level investment in fixed assets (i.e., capital expenditures) on local growth opportunities and testing for a different effect for those subsidiaries facing repatriation taxes (Shroff, Verdi, & Yu, 2014). Our empirical approach offers strong identification as we compare the investment efficiency of foreign subsidiaries subject to repatriation taxes to a counterfactual in the same foreign country-industry-year not subject to these taxes (see Figure 1). We find consistent empirical evidence across multiple specifications and robustness tests that subsidiaries subject to repatriation taxes invest more, and that these investments are less strongly aligned with local growth opportunities. That is, repatriation taxes lead to lower subsidiary-level investment efficiency in the form of inefficient overinvestment.

Next, we test whether agency conflicts drive this effect. We predict that stronger monitoring by the parent will reduce agency conflicts and thus the negative effect of repatriation taxes on investment efficiency. To test this, we follow prior literature and examine several settings in which the degree of monitoring of a foreign subsidiary by central management varies. First, we use membership in a common industry as our proxy for strong monitoring of the subsidiary (e.g., Grinblatt & Keloharju, 2001). Second, we compare wholly-owned subsidiaries to partially-owned subsidiaries because the free-riding by the minority shareholders on the monitoring effort of the majority shareholder (i.e. the parent) has been shown to impair central management's monitoring incentives (Ang, Cole, & Lin, 2000). Third, we analyze differences in the quality of corporate

governance mechanisms in the subsidiary country. High quality corporate governance mechanisms reduce oversight costs for the parent and thus lead to stronger monitoring. Across all tests, we find that the relation between investment efficiency and repatriation taxes does not hold for better-monitored subsidiaries. These tests provide direct evidence that agency conflicts drive the negative effect of repatriation taxes on affiliate-level investment efficiency. This result also suggests that agency conflicts *within* an MNC that allow the affiliate's manager to invest inefficiently are distinct from those between shareholders and central management that allow the MNC's central management to make value-destroying acquisitions (Hanlon et al., 2015).

We next test whether agency conflicts vary across different types of MNCs. Specifically, we predict that the negative effect of repatriation taxes on investment efficiency will be mitigated when the parent's need for repatriating the earnings of the foreign subsidiary is increased. To test this, we split our sample based on the parent's financial constraints (Dyreng & Markle, 2016). Consistent with our hypothesis, we find that the negative effect of repatriation taxes on investment efficiency is reduced when the potential benefit of deferring the repatriation of foreign income is low, i.e. when the parent is financially constrained. This result also suggests that financial constraints and a higher likelihood of repatriating foreign income mitigate agency conflicts associated with repatriation taxes.

Finally, we provide evidence that the effect of repatriation taxes on investment efficiency is causal by exploiting two natural experiments provided by international tax reforms in Japan and the U.K. in 2009 in which repatriation taxes were repealed (Arena & Kutner, 2015). This setting allows us to conduct a difference-in-differences (DiD) analysis by benchmarking the investment behavior of affiliates of Japanese and U.K. MNCs against affiliates of U.S. MNCs, which face repatriation taxes throughout our sample period. This analysis provides clean identification

through an exogenous shock to repatriation taxes. Corroborating our baseline results and consistent with our hypothesis that repatriation taxes drive the efficiency of affiliate-level investment, these tests suggest that the outlined tax reforms increased investment efficiency of subsidiaries owned by Japanese and U.K. MNCs.

Our paper makes multiple contributions to the literature. First, we advance the literature on the economic consequences of repatriation taxes (Foley et al., 2007; Nessa, 2016; Blouin, Krull, & Robinson, 2017; Gu, 2017). Our study is the first to explicitly link repatriation taxes to the efficiency of investments made by the manager of the foreign subsidiary and provides evidence for a distinct cost of deferring the repatriation of foreign income. The M&A decisions studied in prior research (Hanlon et al., 2015; Edwards et al., 2016) are made by the upper management of the consolidated entity (Malmendier & Tate, 2008) and are subject to scrutiny by shareholders and investors (Harford, 1999). The subsidiary-level investment decisions we study are made by a subsidiary manager, who has different incentives and monitoring than the CEO of the consolidated entity (Antràs, Desai, & Foley, 2009). We show that the agency conflicts between central management and subsidiary management, rather than a limited set of investment opportunities as suggested by Edwards et al. (2016), are the economic channel through which repatriation taxes negatively affect affiliate-level investment decisions. This channel explains the efficiency losses for the shareholders of MNCs documented in prior research and provides direct evidence for their speculated driver (Hanlon et al., 2015; Harford, Wang, & Zhang, 2017).

Second, we add to the literature on internal capital markets (Williamson, 1975; Shin & Stulz, 1998; Rajan, Servaes, & Zingales, 2000; Beyer et al., 2017) and offer a tax-based explanation for the observed heterogeneity in investment efficiency of foreign affiliates. Prior research has examined how MNCs mitigate agency conflicts between the parent and its foreign

subsidiaries by, for instance, strategically assigning decision rights (Antràs et al., 2009) or drawing on external information to monitor managers of foreign subsidiaries (Shroff et al., 2014). Our results indicate that repatriation taxes aggravate agency conflicts within MNCs and result in investment behavior that is less aligned with a subsidiary's local growth opportunities. This finding underlines the importance of effective monitoring of foreign subsidiaries that hold excess cash.

Finally, our findings provide needed empirical evidence to inform expectations about the effects of recent changes to the U.S. international tax system. The newly-enacted U.S. law eliminates repatriation taxes of future foreign earnings. Our results indicate that this change will improve the efficiency of investment decisions made by the foreign affiliates of U.S. MNCs by removing a source of agency costs borne under the previous system. To the extent that the current overinvestment due to repatriation taxes is made in the host country of the affiliate, that country may bear negative economic consequences when U.S. (or other foreign) repatriation taxes are reduced. The shareholders of U.S. (or other foreign) multinationals, in contrast, should benefit from the efficiency gains. Our findings should be of interest to policymakers, both in the U.S. and abroad.¹

The remainder of this paper is structured as follows: Section 2 gives an overview of related research. Based on this we deduce our hypotheses in section 3. In Section 4 we discuss our sample and empirical design. We present our results and additional tests in section 5 and 6. Section 7

¹ On December 22, 2017, President Trump signed the Tax Cuts and Job Act (TCJA) into law. Provisions in the new law reduce repatriation taxes on existing earnings held abroad, and eliminate U.S. tax on future foreign earnings of U.S. MNCs. Our empirical results, however, remain relevant to policymakers, both as a basis for prediction of the effects of the law change, and because repatriation taxes will remain a salient and important fiscal tool for tax authorities under all international tax regimes. This is so for two reasons. First, withholding taxes on cross-border payments of dividends, interest, and royalties share the same character as repatriation (income) taxes in that they can be deferred. Second, repatriation taxes are a common tool used in the base erosion prevention measures implemented by countries, so portions of foreign income are likely to remain subject to repatriation taxes.

concludes.

2. Theoretical Background and Prior Research

2.1 Economic Effects of Repatriation Taxes

The home country of an MNC has the right to levy domestic tax on the earnings of foreign subsidiaries. Given that those earnings are first subject to host country tax, the home country chooses from a menu of mechanisms to avoid or reduce the double-taxation of the foreign earnings. These mechanisms fall on a spectrum between full exemption (i.e., the home country exempts the foreign earnings from domestic tax) to full double-taxation (i.e., the home country immediately levies domestic tax on the foreign earnings and allows no credit for the foreign taxes paid). All countries set international tax laws that fall somewhere on this spectrum. Those that are closer to the full exemption end of the spectrum are usually grouped in a “territorial” category, and those nearer the other end are grouped in a “worldwide” category.² In reality, exceptions and provisions in the international tax regimes of all major countries result in them falling at different points all along the spectrum. For example, and highly relevant to our study, the U.S., until 2018, used a worldwide system, but allowed the U.S. tax liability on the foreign earnings (net of credit granted for foreign taxes paid) to be deferred until the underlying foreign income was repatriated to the U.S. parent as a dividend. Because the domestic (U.S.) tax on the foreign income was triggered by the repatriation of the income, we refer to it as a “repatriation tax”.

At the other end of the spectrum, when the home country has a territorial system and fully exempts the foreign income from domestic tax, repatriation of the foreign income does not trigger

² Territorial systems are also referred to as “exemption” or “source-based” systems. Worldwide systems are also referred to as “credit” or “residence-based” systems. We use the terms territorial and worldwide throughout this paper.

any home country tax, and the repatriation tax is zero. If the home country only partially exempts the foreign income (i.e., taxes a portion of it) and allows deferral of the domestic tax liability until repatriation, the repatriation tax would be positive.³

The economic effects of repatriation taxes have been examined in the literature for several decades. Hartman (1985) shows theoretically that the level of repatriation tax does not affect an MNC's decision to repatriate foreign income when the tax rate is constant over time and all foreign income will eventually be repatriated. However, numerous studies have found that repatriation taxes do affect repatriations because expected repatriation taxes vary over time (e.g., due to tax holidays or tax reform; see Altshuler, Newlon, & Randolph, 1994; De Waegenare & Sansing, 2008), and because a parent may be able to use foreign earnings for domestic purposes without triggering repatriation taxes (e.g., by domestically borrowing against passive assets held by a foreign subsidiary; see Altshuler et al., 1994). In addition, Desai, Foley, & Hines (2001) and Desai, Foley, & Hines (2007) find a negative relation between repatriation taxes and payouts of U.S. foreign subsidiaries, consistent with repatriation taxes having an effect on the decision to repatriate.

Several studies suggest that repatriation taxes provide an incentive for MNCs to defer repatriation and to hold cash in their foreign subsidiaries. Foley et al., (2007), for instance, document that repatriation taxes drive foreign cash holdings of U.S. MNCs. Due to an increase in the expected tax benefit of deferring repatriation, this effect became stronger when Congress

³ For example, several countries (e.g., Italy and Germany) exempt 95% of foreign dividends (i.e., tax 5%). In addition, several countries impose repatriation taxes when certain conditions are present. France, for instance, taxes 100% of foreign dividends when they are paid by a controlled foreign corporation (CFC) located in a country with an effective tax rate that is 50% lower than the current French corporate income tax rate of 33.33%. In this case, France grants a credit for foreign taxes paid, which essentially results in a worldwide tax system. For our main empirical tests, we follow prior research (e.g., Markle (2016)) and treat the worldwide/territorial distinction as binary by classifying a country as territorial if it exempts 95% or more of foreign dividends.

started deliberating another repatriation-tax holiday in 2008 (De Simone, Piotroski, & Tomy, 2017). Laplante & Nesbitt (2017) examine different motives to hold cash abroad and find that repatriation taxes – among other reasons (e.g., precautionary motives) – significantly contribute to foreign cash holdings. These tax costs account for 42 percent of the cash differential between U.S. MNCs and purely domestic firms (Gu, 2017).

Holding cash abroad, however, leads to internal capital market frictions (Beyer et al., 2017) that distort the allocation of funds within MNCs (De Simone & Lester, 2017). Campbell, Dhaliwal, Krull, & Schwab (2014) examine this argument and show that investors place a valuation discount on foreign cash holdings. This discount is larger for cash held in tax havens and smaller for MNCs with sophisticated investors. In examining the sources of the valuation discount, Harford et al., (2017) document that a combination of repatriation taxes, internal financing frictions, and agency costs contribute to the lower value of foreign cash holdings. This result is consistent with Yang (2014) who reports a lower marginal value for foreign compared to domestic cash.

While these papers suggest that foreign cash is of lower value to investors than domestic cash, they do not link this difference to specific economic decisions made at the foreign subsidiary level. Along these lines, several studies suggest that repatriation taxes might adversely affect total payouts, external financing, or investment at the firm level. Nessa (2016), for example, reports a negative effect of repatriation taxes on payouts which is concentrated among MNCs that are unable to distribute dividends without incurring repatriation taxes. Similarly, Arena & Kutner (2015) study the repeal of repatriation taxes in Japan and the U.K. in 2009 and find that foreign cash holdings decreased while MNCs initiated larger total payouts to shareholders after the reform. Ma, Stice, & Wang (2017) examine consequences for external financing and find that repatriation taxes are associated with higher loan spreads.

Turning next to investment choices, several studies examine how repatriation taxes affect the acquisition choices made at the parent level. Building on a model by Klassen, Laplante, & Carnaghan (2014), Edwards et al., (2016) find that repatriation taxes reduce the investment opportunity set of MNCs, which leads to less profitable acquisitions abroad. Similarly, and most closely related to our study, Hanlon et al., (2015) document that repatriation taxes lead to a higher likelihood of acquiring foreign rather than domestic targets. Shareholders, however, react negatively to the announcement of acquisitions abroad. Harford et al., (2017) report that MNCs with high repatriation tax costs exhibit negative capital-market reactions to the announcement of foreign capital expenditure and acquisition plans. Both Hanlon et al., (2015) and Harford et al., (2017) speculate that agency conflicts associated with foreign cash holdings may be driving the negative investor responses (Jensen, 1986), but neither study provides direct empirical support for this assertion.⁴ While these papers examine foreign acquisitions, Blouin et al. (2017) study the effects of repatriation taxes on domestic investment. Their results suggest that repatriation taxes reduce the sensitivity of domestic investment to domestic growth opportunities.

Collectively, these studies suggest that repatriation taxes, through the incentive to hold cash abroad, result in internal capital market frictions and negatively affect economic decisions. We contribute to this stream of research by providing direct evidence that repatriation taxes cause the investment behavior of foreign subsidiaries to be less aligned with their growth opportunities. In this regard, our paper is the first to explicitly link repatriation taxes to the investment efficiency of

⁴ A related stream of research examines the effect of repatriation taxes on mergers and acquisitions. Feld, Ruf, Scheuering, Schreiber, & Voget (2016) find that the repeal of repatriation taxes in Japan and the United Kingdom led to an increase in outbound acquisitions of firms located in either of these countries. Similarly, Bird, Edwards, & Shevlin (2017) document that U.S. targets with sizable cash holdings are more likely to be acquired by foreign MNCs not subject to repatriation taxes. Thus, repatriation taxes also affect the volume and direction of mergers and acquisitions and thus shape group structures of MNCs (Huizinga & Voget, 2009; Dyreng, Lindsey, Markle, & Shackelford, 2015).

foreign subsidiaries and to show that agency costs drive this effect.

2.2 *Agency Conflicts and Investment Efficiency*

In the absence of agency conflicts, firm-level investment is a function of the ratio between the market value of assets and their replacement costs (Tobin, 1969) and managers invest until the marginal benefit of investment equals the marginal cost (Yoshikawa, 1980; Hayashi, 1982; Abel, 1983). Thus, managers invest exclusively in positive net present value (NPV) projects while returning excess cash to their capital providers. Such an investment behavior maximizes shareholder value and is therefore regarded as efficient.

Prior research, however, documents that a divergence in principal-agent incentives, for instance between shareholders and managers (Jensen & Meckling, 1976), can lead to agency conflicts in the form of moral hazard (Jensen, 1986; Blanchard, Lopez-de-Silanes, & Shleifer, 1994; Hope & Thomas, 2008), and adverse selection (Myers & Majluf, 1984; Baker, Stein, & Wurgler, 2003). As a result of these conflicts, managers invest sub-optimally, which reduces investment efficiency. Consistent with this, Jensen (1986) shows that self-interested managers maximize their personal welfare through empire building and growing the firm beyond its optimal size; managers reap personal benefits by investing in negative NPV projects that reduce shareholder value.⁵

Several studies provide evidence for firm-level characteristics that moderate the detrimental effect of agency conflicts on investment efficiency. Biddle & Hilary (2006) and Biddle, Hilary, & Verdi (2009), for instance, show that higher financial reporting quality reduces information

⁵ Aside from empire building, managers might derive personal benefits from managerial optimism (Heaton, 2002), the desire to enjoy a quiet life (Bertrand & Mullainathan, 2003), and career concerns (Baker, 2000).

asymmetries between shareholders and managers and thus results in higher investment efficiency. This result is consistent with McNichols & Stubben (2008), who report a negative effect of earnings management on investment efficiency. Similarly, Cheng, Dhaliwal, & Zhang (2013) examine the disclosure of internal control weaknesses after the Sarbanes-Oxley Act and find that investment efficiency increased in response to this disclosure.

In concurrent work, De Simone, Klassen, & Seidman (2017) examine the effect of tax-motivated income shifting on investment decisions and find that firm-level overinvestment is increasing in the aggressiveness of the income shifting of the firm. While De Simone et al. (2017) use similar affiliate-level data in the construction of their proxy for shifting aggressiveness, our study is distinct from theirs in two important ways. First, we are studying the effect of repatriation taxes and they are studying the effect of income shifting, and the two predicted effects on investment efficiency are distinct. Our hypotheses do not depend on how the income came to be reported in a specific affiliate, whether by being “true” income earned there or by income being shifted in or out, but depend only on the reported income being subject to repatriation taxes. Said another way, in the absence of any profit shifting (or, conversely, in a world in which all profits are shifted to minimize immediate tax burdens), our hypotheses would remain the same. Second, the empirical tests in De Simone et al., (2017) are at the firm (i.e., consolidated entity) level while ours are at the affiliate level. As such, similar to Hanlon et al., (2015) and Edwards et al. (2016), De Simone et al., (2017) are examining the investment choices of the central management of the firm while we are examining the distinct investment choices of the local management of the foreign affiliate.

Agency conflicts also exist between the parent of an MNC and the managers of its foreign subsidiaries due to cross-border frictions and moral hazard (Desai, Foley, & Hines 2007). These

conflicts exacerbate resource allocation within MNCs (Stein, 1997) and potentially affect investment behavior. Consistent with this, Mian (2006) shows that local branches of multinational banks forego profitable lending opportunities to small businesses because they are unable to adequately communicate the value of such loans to their parent banks. Shroff et al. (2014) examine the external information environment in which foreign subsidiaries operate and find higher investment efficiency for subsidiaries in more transparent country-industries. This result suggests that external information enables a parent to more closely monitor the investment behavior of its foreign subsidiaries by assessing foreign subsidiaries relative to their local competitors.

In summary, the two relevant streams in the extant literature show that repatriation taxes can negatively affect several firm-level outcomes, and that agency conflicts can impair investment efficiency. We bring these two streams together in developing our hypothesis in the next section.

3. Hypothesis Development

3.1 Repatriation Taxes and Investment Efficiency

All else equal, repatriation taxes encourage an MNC to retain income in its foreign subsidiary rather than paying a dividend to the parent. This strategy reduces the present value of repatriation tax payments, for instance, by exploiting variation in tax rates over time due to tax holidays or tax reform. Moreover, the non-tax costs of deferring the repatriation of foreign income are low for subsidiaries because parents, unlike investors, do not expect steady dividend streams within MNCs (Lintner, 1956; Kopits, 1972). This flexibility in determining the extent of foreign income to repatriate leads to a positive relation between repatriation taxes and foreign cash holdings (Foley et al., 2007).

The choice to leave cash abroad, however, could create agency conflicts between the parent's

central management and its subsidiary. In contrast to external financing, internally generated cash is not subject to effective monitoring and disciplining by external capital providers (Easterbrook, 1984; Jensen, 1986). Subsidiary managers can invest the available cash in projects that create personal benefits while being of low value to shareholders (Harford, 1999). Blanchard, Lopez-de-Silanes, & Shleifer (1994) provide empirical evidence that this occurs. Their findings suggest that managers who receive a cash windfall maximize their personal welfare by selecting economically suboptimal investment projects rather than returning excess cash to shareholders.

Based on these arguments, we hypothesize that repatriation taxes exacerbate these agency conflicts and impair the investment efficiency of foreign subsidiaries. As oversight costs increase and the degree of monitoring decreases, the effect will be stronger (Shroff et al., 2014; Harford et al., 2017). In the absence of sufficient monitoring, the manager of a subsidiary could reap personal benefits by investing the cash retained in the subsidiary to avoid repatriation taxes in projects that are not aligned with the subsidiary's growth opportunities. MNCs located in territorial tax systems, in contrast, do not incur repatriation taxes when bringing foreign income back to the parent. As a result, managers of these subsidiaries have fewer opportunities to consume personal benefits and the investment behavior is expected to be more in line with local growth opportunities. Given these differences, we expect subsidiaries subject to repatriation taxes to invest less efficiently than subsidiaries that do not face this tax. This leads to our baseline hypothesis, stated in the alternative:

H1: *Subsidiary-level investment efficiency is decreasing in repatriation taxes.*

Since we argue that agency conflicts drive the negative effect of repatriation taxes on investment efficiency, one precondition for the hypothesized relation to hold is that the parent is unable to fully observe the investment behavior of its foreign subsidiary. However, prior research suggests that several mechanisms might resolve this friction. Shroff et al. (2014), for instance,

show that external information facilitates the monitoring of foreign subsidiaries and Bloom, Sadun, & Van Reenen (2012) find that improved information technology systems reduce information asymmetries within MNCs. If these or similar mechanisms effectively alleviate information asymmetries between the parent and its foreign subsidiaries, we would not expect to find an effect of repatriation taxes on investment efficiency.⁶

An alternative explanation for the effect hypothesized under H1 is that this investment behavior could still be economically optimal for MNCs and thus not driven by agency conflicts. For instance, investing foreign cash in the subsidiary could lead to a higher after-tax return compared to repatriating cash to the parent and paying the repatriation tax (Arena & Kutner, 2015; Hanlon et al., 2015). In line with this argument, Edwards et al., (2016) show that MNCs subject to high repatriation taxes engage in less profitable acquisitions abroad. Even though this strategy might minimize the tax burden of an MNC, it could lead to foreign investment that is less aligned with a subsidiary's growth opportunities. Consequently, if this effect dominates the investment implications of the outlined agency conflicts, we would not find support for our hypothesis. Based on these arguments, we contend that it is an empirical question whether repatriation taxes impair investment efficiency through the channel of agency conflicts.

3.2 Cross-Sectional Hypotheses

To supplement our baseline hypothesis, we formulate two cross-sectional predictions that examine variation in the effect of repatriation taxes on investment efficiency and that provide

⁶ Aside from these means to reduce the extent of asymmetric information within MNCs, specific tax rules might also alleviate agency conflicts associated with repatriation taxes. The Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA), for instance, enables U.S. MNCs to relocate cash holdings to foreign subsidiaries that are less strongly prone to agency conflicts without triggering repatriation taxes (Murphy, 2017). Since our data covers financial years as of 2006 (see section 4), we are unable to test whether this reform had a mitigating effect on the efficiency of affiliate-level investment in our setting.

evidence for the driver of the effect. First, we expect a weaker effect of repatriation taxes on investment efficiency for subsidiaries that are less susceptible to agency conflicts associated with foreign cash holdings (Jensen, 1986). Agency conflicts depend on the oversight costs of monitoring the foreign subsidiary (e.g., Grinblatt & Keloharju, 2001) and the extent of information transfers within the MNC. A parent that is closely involved in the investment decisions of its foreign subsidiary, for example by retaining decision rights or by obtaining more accurate information about potential investment projects (Björkman, Barner-Rasmussen, & Li, 2004), is better able to monitor the investment behavior of the foreign subsidiary, which reduces the extent of agency conflicts.

The above arguments suggest that the manager of the subsidiary is less likely to invest cash sub-optimally and to consume private benefits when the parent monitors the investment behavior of its foreign subsidiary more closely. Therefore, we expect that stronger monitoring by the parent facilitates investment efficiency by reducing agency conflicts associated with repatriation taxes. This leads to our second hypothesis:

H2: *Stronger monitoring by the parent mitigates the negative effect of repatriation taxes on investment efficiency.*

Our second cross-sectional hypothesis examines the benefit of deferring repatriations. For instance, financially constrained MNCs exhibit high costs of external financing, which reduces the benefit of holding cash abroad (Whited & Wu, 2006; Edwards, Schwab, & Shevlin, 2015). For these MNCs, repatriation taxes are lower than the costs of raising external capital in order to fund investment or payouts (Altshuler & Grubert, 2003; Nessa, 2016; Beyer et al., 2017). Thus, financially constrained MNCs are less flexible in timing repatriations and more regularly return foreign income to the parent. In line with this argument, Albring, Mills, & Newberry (2011) show

that during the 2004 U.S. tax holiday, financially unconstrained firms repatriated more foreign income than financially constrained MNCs. Similarly, Dyreng & Markle (2016) document that financial constraints mitigate outbound income shifting due to lower benefits of (temporarily) avoiding repatriation taxes.

Since financial constraints discourage MNCs to hold cash abroad, we expect agency conflicts that stem from repatriation taxes to be less severe for these firms. Lower cash holdings limit the opportunities of subsidiary managers to consume personal benefits. Consequently, we expect financial constraints to mitigate the negative effect of repatriation taxes on investment efficiency. This leads to our third hypothesis:

H3: *The negative effect of repatriation taxes on investment efficiency is reduced when the parent is financially constrained.*

4. Empirical Design and Data

4.1 Empirical Design

To test our hypothesis that repatriation taxes reduce the investment efficiency of foreign subsidiaries, we draw on Shroff et al., (2014) and estimate the following subsidiary-level OLS regression:

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,t} + \beta_3 RepatTax_{c,t} * PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (1)$$

where $Investment_{i,t}$ is the subsidiary's yearly capital expenditures scaled by lagged total assets.⁷

⁷ $Investment_{i,t}$ measures the net change in fixed assets from year $t-1$ to t and thus resembles capital expenditures net of annual depreciation charges (i.e. net investment in fixed assets). In our sensitivity tests, we adjust this proxy for annual depreciation charges, yielding a measure for gross investment in fixed assets. Our results are qualitatively similar when using this alternative measure and suggest that our findings are not affected by differences in depreciation

$PE_{c,j,t}$ is the price-to-earnings (PE) ratio and captures local growth opportunities of the foreign subsidiary in year t . We measure the PE-ratio for the country-industry-year in which the subsidiary invests. $RepatTax_{c,t}$ is an indicator variable with the value of 1 if the MNC that owns the subsidiary is located in a worldwide tax system and 0 for subsidiaries of MNCs resident in a country with a territorial tax system.⁸ Alternatively, we compute a continuous measure for the extent of repatriation taxes as the difference in the statutory tax rates of the country in which the MNC is located and the country of the subsidiary.⁹

Vector $Control_{i,t}^k$ includes subsidiary-level controls prior research has found to affect investment (e.g., Cummins, Hassett, & Hubbard, 1996; Baker et al., 2003). To this end, we include the subsidiary's return-on-assets (RoA_t) to control for internally generated funds available for investment (Faulkender & Petersen, 2012) and $Size_t$ (measured as the natural logarithm of total assets) to capture differences in investment opportunities (Carpenter & Petersen, 2002) as well as in the allocation of decision rights between the parent and the subsidiary (Robinson & Stocken, 2013). We also include $Tangibility_t$ to control for the stock of fixed assets (Biddle & Hilary, 2006). Furthermore, we include several parent-level controls that are related to subsidiary-level investment. We add $Total Participation_t$ as the sum of direct and indirect participation of the parent in the subsidiary. MNCs choose their ownership in foreign subsidiaries to align incentives

rules across countries (see Table 9). Moreover, in contrast to Shroff et al, (2014), we do not use annual changes in total assets as our dependent variable for two reasons. First, repatriation taxes result in higher cash holdings and might therefore mechanically lower the association between total assets and local growth opportunities. Second, in line with prior research on investment efficiency (e.g., Biddle & Hilary (2006) and Biddle, et al., (2009)), we are interested in real investment of a foreign subsidiary, which is more closely measured with net changes in fixed assets.

⁸ We collect information on tax systems and corporate tax rates from EY Corporate Tax Guides. We follow prior research (e.g., Markle (2016)) and classify the tax system in which an MNC is resident as *territorial* or *worldwide*.

⁹ In case this difference is negative, we set $RepatTax_{c,t}$ to zero since the foreign tax credit will (over)compensate any domestic taxes. $RepatTax_{c,t}$ is also set to zero if the MNC is resident in a territorial tax system.

between the parent and the subsidiary and to facilitate monitoring (Antràs et al., 2009). We also include the parent's cash-flow-to-total-assets ratio (*Cash Flow Parent_t*) because prior research suggests that MNCs use internal capital markets to fund investment of foreign subsidiaries (Shin & Stulz, 1998; Arena & Kutner, 2015). We provide variable definitions in Appendix A.

In our main regression model, we include fixed effects ($\alpha_{c,j,t}$) for the country-industry-year for which we observe investment of a subsidiary. This fixed-effects structure absorbs time-invariant as well as time-varying effects that equally affect investment of all subsidiaries in a given country-industry-year (e.g., economic shocks, differences across industries and/or countries). However, this approach yields estimates for variables that vary within a given country-industry-year. Importantly, this includes characteristics of the MNC, such as the tax system in which the parent is located and whether repatriation taxes apply on the income earned in a foreign subsidiary. Figure 1 illustrates the fixed-effects structure, which limits the counterfactual to the same country-industry-year (Bethmann, Jacob, & Müller, 2017) and provides strong identification. As we employ the country-industry-year fixed effects in most specifications, the coefficient of $PE_{c,j,t}$ is absorbed due to a lack of within-country-industry-year variation.

β_3 (on $RepatTax_{c,t} * PE_{c,j,t}$) is our coefficient of interest. This coefficient captures the sensitivity of subsidiary-level investment to local growth opportunities conditional on whether profits distributed by the subsidiary are subject to repatriation taxes. Thus, we compare, for instance, the yearly investment efficiency of two Irish subsidiaries operating in the same industry. One subsidiary is owned by a U.S. MNC (i.e. subject to repatriation taxes) and the other by an Austrian MNC (i.e. not subject to repatriation taxes). Per Hypothesis 1, we expect a negative and significant β_3 , suggesting that the investment behavior of subsidiaries subject to repatriation taxes is less strongly aligned with local growth opportunities; i.e., their investment behavior is “less

efficient”. In line with prior literature (for example Harford et al., 2017), we expect a positive and significant coefficient on $RepatTax_{c,t}$, indicating that repatriation taxes not only result in lower investment efficiency but also in more investment. Collectively, we would interpret such results as evidence of economically suboptimal overinvestment.

4.2 *Measuring Local Growth Opportunities*

Following Shroff et al. (2014) and Bekaert, Harvey, Lundblad, & Siegel (2007), we use PE-ratios per country-industry-year as a measure for local growth opportunities. This is an intuitive measure as it builds on the rationale that financial markets price future growth opportunities. A higher share price relative to current earnings of a firm suggests that investors expect stronger firm-level growth. Bekaert et al., (2007) examine this argument and show that weighted (country-specific) global industry PE-ratios are valid predictors for the growth opportunities in country-industries. An additional benefit of using country-industry-year PE-ratios results from them being exogenous to the individual subsidiary in our sample. Since PE-ratios require data of *listed* firms in a country-industry-year, the *private* (i.e. unlisted) subsidiaries in our sample do not enter the calculation of the PE-ratios.

We collect Datastream’s equity indices to construct PE-ratios for each country-industry-year in which we observe investment of foreign subsidiaries. Datastream provides several versions of monthly equity indices along the taxonomy of the Industry Classification Benchmark (ICB).¹⁰ We use equity indices based on the 1-digit ICB level as this classification segregates subsidiaries into

¹⁰ ICB is an industry classification taxonomy launched by Dow Jones. The classification includes 10 industries (1-digit-level), 19 supersectors (2-digit-level), 41 sectors (3-digit-level), and 114 subsectors (4-digit-level). For further information refer to <http://www.ftserussell.com/financial-data/industry-classification-benchmark-icb>.

broad industrial categories while covering most countries available in Datastream.¹¹ We take the median of the monthly PE-ratios to obtain a yearly measure and match PE-ratios with the remaining data using NACE industry codes.¹²

4.3 *Subsidiary Data and Sample*

We supplement these data with subsidiary-level unconsolidated financial statement data and parent-level consolidated financial statement data from Bureau van Dijk's Orbis database. Following Shroff et al. (2014), we construct MNCs' holding structures and identify directly- and indirectly-held subsidiaries using the identifier of the parent and the shareholding percentage of the direct owner. Indirect shareholdings in our sample include subsidiaries from the second level of participation (i.e., with one intermediate subsidiary) to the fifth level of participation (i.e., with four intermediate subsidiaries).

We drop subsidiaries with no or limited financial statement data, subsidiaries that file consolidated financial statements (Orbis code "C1" or "C2"), and subsidiaries with no NACE industry classification (necessary to match the PE-ratios). We also drop domestic subsidiaries resident in the same country as the MNC since we are interested in cross-border shareholdings leading to repatriation taxes. This procedure results in 567,600 subsidiary-year observations.

We require parents to hold a total participation in a subsidiary of at least 50 percent. This threshold ensures that parents have control over a foreign subsidiary and are able to influence its

¹¹ Less aggregated ICB levels (e.g., 3-digit-level or 4-digit-level) would not allow a meaningful analysis due to a low number of subsidiary-year observations in the respective country-industry-year as well as a low number of firms to construct meaningful PE-ratios. This significantly reduces the number of countries with data available on PE-ratios.

¹² We match PE-ratios per ICB industry with Orbis data based on a matching table gratefully provided by Gwen Yu. This matching procedure is necessary as industry codes in Orbis do not contain information on a subsidiary's ICB classification.

decisions (e.g., whether or not to distribute a dividend).¹³ We follow the standard procedure of excluding financial (NACE code 6400 to 6899) and utility subsidiaries (NACE code 3500 to 3999) due to unique investment patterns in these industries (e.g. Badertscher, Shroff, & White, 2013). Lastly, we drop financial holdings (NACE Code 7010) because these subsidiaries tend to predominantly invest in financial assets (Shroff et al., 2014).

Our dataset covers the years 2006 to 2014. As several variables (e.g., $Investment_{i,t}$) are based on annual changes, our final sample effectively covers the years 2007-2014. We drop observations with missing or negative values for total assets, operating revenue, fixed assets, or cash and cash equivalents. Lastly, we require total assets, operating revenue, and fixed assets to have a value of at least US\$10,000 in order to prevent denominator effects from biasing our results. Our main sample includes 48,470 subsidiary-years. The sample size varies slightly across empirical specifications as not all variables are available for all observations.

Table 1 presents descriptive statistics for the main variables used in our analyses. In Panel A, we present information for the full sample. The average annual investment (change in fixed assets) of the subsidiaries in our sample amounts to 0.45 percent of total assets.¹⁴ The average PE-ratio is 17.8, which is in line with the values reported in Shroff et al. (2014). On average, subsidiaries report a return-on-assets of 5.3 percent, total assets of US\$64 million, and hold 23.6 percent of their total assets in fixed assets. With respect to parent-level controls, we find that the average cash-flow-to-assets ratio is 8.5 percent and parents hold an average total participation of 95.1 percent in their foreign subsidiaries.

¹³ Our results are qualitatively similar when using lower thresholds for a parent's total participation (e.g., 25 percent).

¹⁴ When the change is scaled by fixed assets instead of total assets, average annual investment amounts to 14.8%.

In Panels B and C, we present information for subsamples based on whether the MNC faces repatriation taxes on income earned in the foreign subsidiary. The two subsamples do not differ with regard to our main dependent variable, $Investment_{i,t}$, and the participation held by the parent ($Total\ Participation_t$). The differences between the other control variables are statistically significant (all $p < 0.05$), indicating the need for controls in our multivariate analysis.

26.2 percent of our subsidiary-year observations are subject to repatriation taxes and the average repatriation tax in this subsample amounts to 7.95 percent (Panel C). These figures suggest that repatriation taxes are a relevant tax cost for a significant proportion of the MNCs in our sample. In Panel D, we show information on the group structures of the MNCs. The observations in our sample stem from 10,629 unique subsidiaries held by 2,714 unique parents. Thus, the parents in our sample hold, on average, 3.9 subsidiaries, which is equal to 17.9 subsidiary-years per parent.

In Table 2, we present the distribution of observations across countries. We display information for the countries of the MNC owning the subsidiaries in our sample in Panels A and B. Information on the countries in which the subsidiaries are located is in Panel C. The MNCs not subject to repatriation taxes in our sample are mainly resident in large, developed countries, such as Japan, Germany, France, and the U.K. Panel B of Table 2 suggests that the majority of MNCs subject to repatriation taxes are located in the U.S., being the only G20 country that levied these taxes throughout our sample period.¹⁵ The subsidiaries in our sample are also predominantly resident in Western European countries, but a sizable proportion of observations are in countries in Eastern Europe (e.g., Poland, Czech Republic) and Asia (e.g., South Korea, China). The

¹⁵ The U.K. and Japan both repealed repatriation taxes in 2009. Thus, for the first two years of our sample, we still have observations for foreign subsidiaries of U.K. and Japanese parents subject to repatriation taxes. We exploit these 2009 tax reforms as natural experiments in our supplemental tests (see Section 6).

proportion of subsidiary-years subject to repatriation taxes ranges from 43.4 percent in the U.K. to 13.6 percent in Slovenia.¹⁶

5. Results

5.1 Repatriation Taxes and Cash Holdings

Since our hypotheses assume that repatriation taxes are associated with higher cash holdings abroad, we start our analysis by testing the correlation between repatriation taxes and cash-holdings of the subsidiaries in our sample. Figure 2 plots the mean of the subsidiary cash ratio (i.e., cash-to-total-assets in year t) conditional on whether the subsidiary faces repatriation taxes. In line with evidence that repatriation taxes lead to higher aggregate cash holdings (Foley et al., 2007), these taxes are positively associated with the amount of cash held in foreign subsidiaries. The difference in cash holdings between the two groups ranges from 1.5 to 4 percentage points of total assets and is statistically significant in all sample years (untabulated; all $p < 0.01$).

We supplement the graphical evidence in Figure 2 by estimating the following subsidiary-level OLS regression:

$$CashRatio_{i,t} = \alpha_{c,j} + \alpha_t + \beta_1 RepatTax_{c,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (2)$$

We present regression results in Table 3. In Columns 1 and 2, we use an indicator variable for $RepatTax_{c,t}$ while applying the continuous measure in Columns 3 and 4. Furthermore, we separately include country-industry and year fixed effects in Columns 1 and 3; the specification in

¹⁶ Because our analyses are at the subsidiary-year level and include country-industry-year fixed effects, the range in proportions across countries is not problematic. The difference in the share of observations subject to repatriation taxes results from the pattern of cross-border shareholdings observed in the data. For instance, while parents from the U.S. hold a sizeable proportion of foreign subsidiaries located in the U.K., subsidiaries in Slovenia are predominantly owned by parents resident in European countries not levying any repatriation taxes.

Columns 2 and 4 includes country-industry-year fixed effects. Across all specifications, we find a positive and significant coefficient on $RepatTax_{c,t}$. Corroborating the graphical evidence above, these results suggest that repatriation taxes are positively associated with the amount of cash held by the subsidiaries in our sample.

5.2 Growth Opportunities and Investment

Next, we test whether subsidiary investment is associated with country-industry-year PE-ratios as our measure for local growth opportunities. If PE-ratios capture local growth opportunities (Baker et al., 2003; Shroff et al., 2014), we expect investment to increase in PE-ratios. To determine if this is the case, we estimate the following subsidiary-level OLS regression:

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (3)$$

Table 4, Column 1 displays regression results.¹⁷ As expected, the coefficient on $PE_{c,j,t}$ is positive and significant. Thus, subsidiary investment increases in the PE-ratio of the respective country-industry-year, indicating that our measure represents local growth opportunities. In Columns 2 and 3, we split the sample based on whether the subsidiary faces repatriation taxes. The coefficient on $PE_{c,j,t}$ is positive and significant in the absence of repatriation taxes (Column 2) and insignificant for the subsample of subsidiaries subject to repatriation taxes (Column 3). These results provide initial support for our hypothesis: the investment behavior of subsidiaries that face repatriation taxes seems be less in line with local growth opportunities.

¹⁷ In contrast to our main specification, we separately include country-industry and year fixed effects to obtain a coefficient for PE .

5.3 Baseline Results

To test Hypothesis H1, we estimate Equation (1) and present results in Table 5. Corroborating our initial results, we find a negative and significant coefficient on $RepatTax_{c,t} * PE_{c,j,t}$. This result holds in Column 1 for the binary measure and in Column 2 for the continuous measure of $RepatTax_{c,t}$. These results suggest that investment of subsidiaries that face repatriation taxes is less in line with local growth opportunities, consistent with H1.¹⁸ The coefficient estimate on $RepatTax_{c,t} * PE_{c,j,t}$ is also economically significant. A coefficient of -0.031 (Column 1) suggests that the presence of repatriation taxes reduces the sensitivity of a subsidiary's investment to local growth opportunities by 6.9 percent.¹⁹

The main coefficient on $RepatTax_{c,t}$ is marginally insignificant for the binary measure ($p = 0.15$) but positive and significant for the continuous measure in Column 2. Thus, subsidiaries subject to repatriation taxes tend to invest more than subsidiaries in the same country-industry-year that do not face these taxes. Because $RepatTax_{c,t} * PE_{c,j,t}$ can be interpreted as an indicator of *how efficiently* subsidiaries invest, these results indicate that repatriation taxes lead to more investment abroad, but that the investment is less strongly aligned with local growth opportunities. Overall, we interpret this finding as evidence for repatriation taxes resulting in inefficient overinvestment.

¹⁸ In this specification, the variable PE is omitted because it is measured on the country-industry-level and thus collinear to the country-industry-year fixed effects. Adding country-industry-year fixed effects provides superior identification since we compare subsidiaries that operate in the same country, industry, and year. Moreover, the other control variables are similar to those in the specification in which we use country-industry and year fixed effect (see Table 4), suggesting that the fixed effects do not over-specify our model. Therefore, we also use country-industry-year fixed effects in the subsequent cross-sectional tests.

¹⁹ We calculate this effect based on a one unit change in the PE-ratio and the mean value of investment, which is 0.453 (see Table 1): $1 * -0.031/0.453=6.9\%$.

5.4 Cross-Sectional Tests

5.4.1 Stronger monitoring of the subsidiary

To test Hypothesis 2, we use several settings in which we expect differences in the monitoring of foreign subsidiaries to moderate the effect of repatriation taxes on investment efficiency. We present results in Table 6. First, Grinblatt & Keloharju (2001) suggest that parents operating in the same industry as the subsidiary face lower oversight costs and thus engage in more effective monitoring. In Columns 1 and 2 of Panel A, we split the sample based on whether the parent and the subsidiary exhibit the same 1-digit NACE code. In line with our expectation, the coefficient on $RepatTax_{c,t} * PE_{c,j,t}$ is insignificant for subsidiaries that operate in the same industry as their parents. Consistent with less efficient monitoring, the coefficient remains negative and significant for subsidiaries that operate in a different industry as their parents.

Second, Ang, Cole, & Lin (2000) indicate that monitoring decreases with the presence of minority shareholders. As the extent of minority ownership in the subsidiary increases, the parent faces lower incentives to monitor as minority shareholders free-ride on its monitoring effort. To assess this prediction, we split our sample based on whether a subsidiary is partially owned by minority shareholders. As expected, the coefficient on $RepatTax_{c,t} * PE_{c,j,t}$ is insignificant for wholly-owned subsidiaries (Column 1, Panel B). The coefficient, however, remains negative and significant for subsidiaries that are additionally owned by a minority shareholder (Column 2, Panel B).

Third, Asiedu & Esfahani (2001) argue that the quality of institutions and corporate governance mechanisms of the subsidiary country shape the parent's oversight costs. Thus, if the subsidiary is located in a country with weak corporate governance mechanisms, the parent faces

high oversight costs, which leads to lower monitoring. We use the World Bank's Corporate Governance Indicator as a country-level measure for the quality of corporate governance mechanisms and split the sample at the median of the score.²⁰ Consistent with our expectation, we find that the coefficient on $RepatTax_{c,t} * PE_{c,j,t}$ is insignificant for subsidiaries located in countries with high quality corporate governance mechanisms (Column 1, Panel C). In contrast, the coefficient for $RepatTax_{c,t} * PE_{c,j,t}$ is negative and significant if the corporate governance mechanisms of the subsidiary country are of low quality (Column 2, Panel C).

Collectively, these results suggest that stronger monitoring by the parent mitigates the negative effect of repatriation taxes on investment efficiency. These tests support Hypothesis 2 and provide evidence that repatriation taxes impair investment efficiency through the channel of agency conflicts between the parent and its subsidiary.

5.4.2 *Financial constraints at the parent level*

To test Hypothesis 3, we split the sample based on whether the parent is financially constrained. The underlying argument is that a financially constrained parent is more likely to repatriate foreign income as it has to rely on internal funds in order to finance its domestic operations (see, for example, Desai et al., 2007). Because this results in lower cash holdings abroad, agency conflicts between a parent and its subsidiary tend to be less severe in this case. Therefore, we expect a weaker effect of repatriation taxes on investment efficiency.

²⁰ This measure runs from -2.5 for bad corporate governance to 2.5 for good corporate governance. We lose some observations as both measures are not available for all countries of our sample. Low corporate governance countries are: Bulgaria, Croatia, Czech Republic, Greece, Hungary, Italy, Malta, Poland, Romania, Russia, Slovenia, Spain, and Turkey. High corporate governance countries are: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, and the U.K. We cross-check our results with a similar measure compiled by Transparency International and find that the results do not change.

We use the parent's cash-flow-to-total-assets ratio as a proxy for financial constraints. To this end, we sort parents within a country-industry into terciles of the cash-flow-to-total-assets ratio. We then classify parent-years for which a parent is in the lowest tercile as financially constrained. This approach is appropriate in our setting as parents that are low in cash compared to their country-industry peers have to predominantly rely on internal funds and thus are more likely to repatriate income from their foreign subsidiaries.²¹

We present results in Table 7. In line with our prediction, we find a negative and significant coefficient on $RepatTax_{c,t} * PE_{c,j,t}$ for the subsample of parents that we classified as financially constrained (Column 2). In Column 1, the coefficient on $RepatTax_{c,t} * PE_{c,j,t}$ for financially unconstrained parents is insignificant. We conclude that the negative effect of repatriation taxes on investment efficiency is conditional on the parent's financial constraints and varies with the benefits of deferring repatriation of foreign income.

6. Additional Tests

6.1 Sensitivity Analysis

We conduct several additional tests to assess the sensitivity and the robustness of our baseline findings. We present results in Table 8. First, we adjust our measure for subsidiary-level investment and add back annual depreciation on fixed assets. This expense affects the book value of fixed assets on the balance sheet and, as a consequence, might influence our primary investment measure. By adjusting $Investment_{i,t}$ for annual depreciation, we transform our measure from a

²¹ Financial constraints are inherently hard to measure and no empirical proxy has been shown to consistently capture the underlying construct (Farre-Mensa & Ljungqvist, 2016). Using other common measures that are based on capital market data (e.g. bond rating) would shrink our sample size by about 80% as most of the parent firms in our sample are not listed.

net investment rate in fixed assets into a measure of annual gross investments in fixed assets. Although lowering the sample size, we continue to find negative and significant coefficients on $RepatTax_{c,t} * PE_{c,j,t}$ in Columns 1 and 2. Furthermore, the size of the coefficients is similar to our baseline results (see Table 5). Thus, depreciation on fixed assets does not affect our baseline results.

Second, we add the subsidiary's cash ratio as an additional control variable to proxy for funds available for investment. One potential concern with adding this variable to the baseline model is that the cash ratio is endogenous to repatriation taxes as subsidiaries that face repatriation taxes in our sample report higher cash holdings. Results in Columns 3 and 4, however, indicate that including this variable in the regression model does not affect our baseline results.

Third, we drop subsidiaries subject to repatriation that are owned by non-U.S. MNCs. Results in Column 5 and 6 are similar to our baseline results. This test provides direct evidence that the negative effect of repatriation taxes on investment efficiency equally holds for subsidiaries of U.S. MNCs. Similarly, we test if our results hold when excluding foreign subsidiaries owned by U.S. MNCs as these observations account for the majority of subsidiary-years subject to repatriation taxes. In Columns 7 and 8, we continue to find a negative and significant coefficient on $RepatTax_{c,t} * PE_{c,j,t}$. Although they represent a major share of our sample, subsidiaries of U.S. MNCs do not drive our results.

Taken together, these sensitivity tests indicate that our baseline results are robust to an alternative measure for subsidiary-level investment and to controlling for the subsidiary's cash holdings. Furthermore, the effect of repatriation taxes on investment efficiency is not limited to the international tax system that was, until recently, in place in the U.S. but similarly extends to subsidiaries of MNCs located in worldwide-tax system countries other than the U.S.

6.2 Tax Reforms in the UK and in Japan

6.2.1 Institutional Setting and Research Design

In 2009, both the U.K. and Japan switched from a worldwide to a territorial tax system. As a result of this reform and starting in 2009, MNCs resident in the U.K. and in Japan are not subject to repatriation taxes on income earned in their foreign subsidiaries. We follow Arena and Kutner (2015) and exploit these tax reforms as a quasi-natural experiment to assert a causal interpretation of our baseline findings.

In our setting, we expect that after the elimination of repatriation taxes the investment behavior of foreign subsidiaries owned by British or Japanese MNCs is more strongly aligned with local growth opportunities relative to a control group of foreign subsidiaries of MNCs still subject to these taxes. To test this, we apply a DiD research design with subsidiaries of British and Japanese MNCs as the treatment group. We use subsidiaries of U.S. MNCs as a control group since the U.S. levied repatriation taxes throughout the entire sample period. We estimate the following DiD specification separately for subsidiaries of British and Japanese MNCs using OLS:

$$\begin{aligned} Investment_{i,t} = & \alpha + \beta_1 PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \beta_3 Country_c + \beta_4 Post_t + \\ & \beta_5 Country_c * Post_t + \beta_6 Country_c * PE_{c,j,t} + \beta_7 Post_t * \\ & PE_{c,j,t} + \beta_8 Country_c * Post_t * PE_{c,j,t} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

To capture the difference in differences, we introduce an indicator variable for the treatment group ($Country_c$) and an indicator variable for the years after the tax reform ($Post_t$). $Country_c$ is equal to 1 if the subsidiary is owned by an MNC resident in the U.K. or Japan, respectively. $Post_t$ is equal to 1 for years after the tax reform. As the reform became effective in both countries on January 1, 2009, $Post_t$ is equal to 1 for years after 2008. The interaction term, $Country_c *$

$Post_t$ captures investment in the post period of subsidiaries owned by U.K. or Japanese MNCs relative to subsidiaries of U.S. MNCs. We expect the coefficient on $Country_c * Post_t$ to be negative, which suggests that subsidiaries with a British or Japanese parent invested less after the reform (Arena & Kutner, 2015). The main coefficient of interest is the treatment effect *conditional* on growth opportunities. Therefore, we interact $Country_c * Post_t$ with $PE_{c,j,t}$ and expect a positive coefficient on this interaction ($Country_c * Post_t * PE_{c,j,t}$). In other words, we expect that after the reform, subsidiaries of British or Japanese MNCs invest more efficiently than foreign subsidiaries owned by U.S. parents.

Since we again use country-industry-year fixed effects, we compare treatment subsidiaries to control subsidiaries in the same foreign country, industry, and year and mitigate concerns that unobserved country or industry variables might affect our results. Subsidiaries differ, however, with respect to the country in which their parent is located, as treated subsidiaries are owned by British or Japanese MNCs and the control subsidiaries by U.S. MNCs.²²

6.2.2 Results

In Table 9, we present results for the DiD estimation including subsidiaries of British (Columns 1 and 2) and Japanese MNCs (Columns 3 and 4), respectively. For both reforms, we find a consistent positive and significant coefficient on $Country_c * Post_t * PE_{c,j,t}$. This result holds for specifications without fixed effects (Columns 1 and 3) as well as regressions that include country-industry-year fixed effects (Columns 2 and 4).²³ Moreover, the coefficient on $Country_c *$

²² Results remain qualitatively unchanged if we do not include any fixed effect except from *Country* and *Post* in the DiD specification (see Columns 1 and 3 of Table 9, respectively).

²³ In unreported test we find qualitatively similar results when we extend the pre- and post-period to two years each.

$Post_t$ is negative and significant in three out of four specifications. This result is consistent with Arena & Kutner (2015) and indicates that foreign subsidiaries of MNCs affected by the tax reform lowered their investment. Taken together, our results suggest that the repeal of repatriation taxes increased the investment efficiency of British and Japanese subsidiaries relative to subsidiaries owned by U.S. MNCs. Moreover, an increase in investment efficiency combined with lower investment indicates that British and Japanese subsidiaries reduced inefficient overinvestment.

To further validate our results from the DiD estimation, we conduct placebo tests in which we assign the reforms in the U.K. and Japan to random years other than 2009. Similarly, we run the same regressions on a sample of subsidiaries owned by MNCs located in countries without a similar tax reform, such as Germany or France, and compare their investment behavior to subsidiaries owned by U.S. MNCs. In all tests (untabulated), the coefficient on $Country_c * Post_t * PE_{c,j,t}$ is insignificant, corroborating our evidence for the U.K. and Japan tax reforms. Importantly, the results from these natural experiments suggest that repatriation taxes have a causal effect on the investment efficiency of subsidiaries.

7. Conclusion

Using a large global sample of subsidiaries of MNCs, we show that repatriation taxes reduce the investment efficiency of their foreign subsidiaries. Cross-sectional tests based on the degree of monitoring of the subsidiaries suggest that this effect is driven by agency conflicts over cash held abroad. Financial constraints of the parent, in contrast, mitigate the negative effect of repatriation taxes on investment efficiency making an MNC less prone to the outlined agency conflicts. Taken together, our results indicate that repatriation taxes not only incentivize MNCs to hold cash abroad (Foley et al., 2007), but also enable managers of foreign subsidiaries to invest this cash

suboptimally.

To our knowledge, ours is the first study to explicitly link repatriation taxes to lower investment efficiency of foreign subsidiaries. We contribute to the literature on the economic consequences of repatriation taxes by documenting that agency conflicts drive the negative effect of repatriation taxes on affiliate-level investment. In this regard, we provide direct evidence for the speculated economic channel through which repatriation taxes might negatively affect firm-level outcomes as documented in prior research (Hanlon et al., 2015; Harford et al., 2017). Our findings also add to the literature on internal capital markets (Beyer et al., 2017; Williamson, 1975) and suggest that repatriation taxes foster agency conflicts within MNCs. This result underlines the importance of effective monitoring of foreign cash holdings and the associated investment decisions. Lastly, we contribute needed empirical evidence on the potential consequences of the most recent U.S. tax reform that eliminates repatriation taxes on future foreign earnings. Our results indicate that this reform is likely to result in efficiency gains for U.S. MNCs and their shareholders while potentially leading to lower investment in the countries in which their foreign subsidiaries operate.

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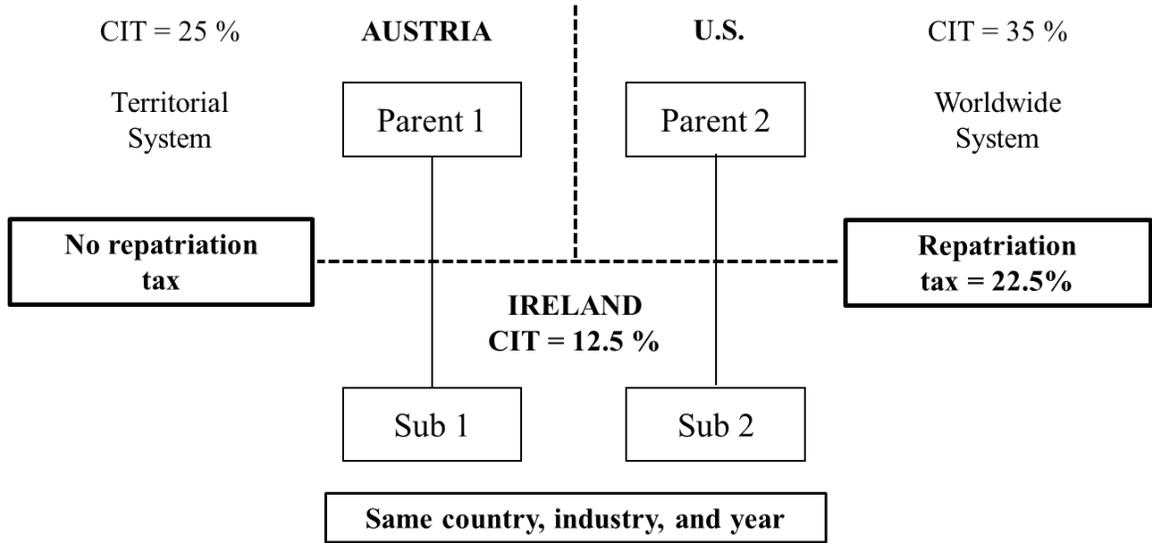
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APPENDIX A

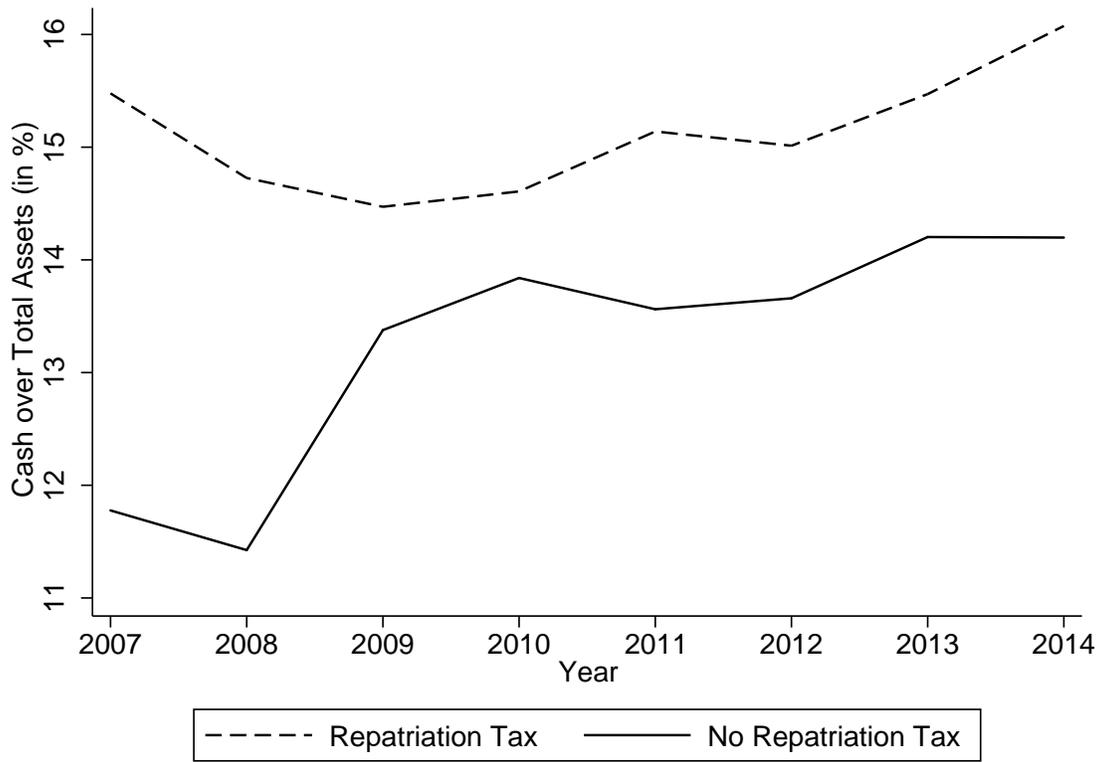
<i>Variable</i>	Definition
<i>Capital Intensity</i>	Fixed assets over total assets (subsidiary-year level).
<i>Cash Ratio</i>	Cash holdings over total assets (subsidiary-year level).
<i>Cash Flow Parent</i>	Cash flow over total assets (parent-year level).
<i>Investment</i>	Change in fixed assets before depreciation relative to prior year's total assets (subsidiary-year level).
<i>Gross Investment</i>	Change in fixed assets adjusted for annual depreciation relative to prior year's total assets (subsidiary-year level).
<i>PE</i>	Price-to-Earnings ratio (country-industry-year level). We calculate the annual value as the median of monthly values.
<i>RepatTax</i> (indicator)	Indicator variable for repatriation taxes based on the parent-subsidiary country pair: 0 for subsidiary-years of MNCs resident in a territorial tax system or a worldwide tax system with a lower tax rate than the host country of the subsidiary; 1 for subsidiary-years of MNCs resident in worldwide tax system with a higher tax rate than host country of the subsidiary.
<i>RepatTax</i> (continuous)	Continuous measures for repatriation taxes based on the parent-subsidiary country pair: Difference in statutory tax rate of the country in which the MNC is resident and the host country of the subsidiary. We set the measure to zero if the MNC is resident in a territorial tax system and if the MNC is resident in a worldwide tax system but the tax rate in this country is lower than the tax rate in host country of the subsidiary.
<i>RoA</i>	Profit or loss after taxes over total assets (subsidiary-year level).
<i>Size</i>	Natural logarithm of total assets (subsidiary-year level).
<i>Total Participation</i>	Total direct and indirect participation of a parent in a subsidiary (subsidiary level).

Figure 1: Example for the empirical approach



Note: This figure illustrates our empirical approach. Assume we have two Irish subsidiaries that operate in the same country, industry, and year. By including country-industry-year fixed effects, we limit our comparison to these two Irish subsidiaries. However, the subsidiaries differ with regard to their parent’s home country, which affects repatriation taxes. The subsidiary with the Austrian parent (Sub 1) does not face repatriation taxes because Austria applies a territorial tax system. Sub 2 has a U.S. parent and therefore faces repatriation taxes of 22.5 percent (U.S. CIT credited with the Irish CIT) since the U.S. applies a worldwide tax system.

Figure 2: Subsidiary Cash Ratio over Time



Note: This graph presents the mean subsidiary cash ratio for sample years 2007 to 2014. We split the sample based on whether a subsidiary is subject to repatriation taxes. Untabulated t-tests suggest that the difference is statistically significant in each sample year (all $p < 0.01$).

Table 1: Descriptive Statistics

<i>Variables</i>	N	Mean	S.D.	Q1	Median	Q3
Panel A: All						
<i>Investment (in %)</i>	48,470	0.45	8.15	-2.36	-0.29	1.52
<i>PE Ratio</i>	48,470	17.77	7.81	12.85	16.25	20.35
<i>Repat Tax Rate (in %)</i>	48,470	2.05	4.46	0	0	1.01
<i>Repat Tax Dummy</i>	48,470	0.261	0.439	0	0	1
<i>RoA (in %)</i>	48,470	5.26	12.51	0.05	4.49	11.08
<i>Size</i>	48,470	9.77	1.65	8.58	9.73	10.91
<i>Tangibility (in %)</i>	48,470	23.62	22.82	4.58	15.69	37.65
<i>Total Participation (in %)</i>	48,470	95.12	12.31	99.98	100	100
<i>Cash Ratio Subsidiary (in %)</i>	48,470	13.92	17.21	1.48	7.05	20.01
<i>Cash Flow Parent (in %)</i>	48,470	8.50	5.19	5.30	7.96	11.4
Panel B: No Repat Tax						
<i>Investment (in %)</i>	35,807	0.45	8.22	-2.42	-0.30	1.58
<i>PE Ratio</i>	35,807	17.87	7.89	12.95	16.35	20.35
<i>Repat Tax Rate (in %)</i>	35,807	0	0	0	0	0
<i>Repat Tax Dummy</i>	35,807	0	0	0	0	0
<i>RoA (in %)</i>	35,807	4.841	12.49	-0.19	4.174	10.61
<i>Size</i>	35,807	9.70	1.66	8.50	9.66	10.85
<i>Tangibility (in %)</i>	35,807	24.20	22.72	5.03	16.67	38.57
<i>Total Participation (in %)</i>	35,807	95.1	12.16	99.95	100	100
<i>Cash Ratio Subsidiary (in %)</i>	35,807	13.50	16.70	1.48	6.90	19.36
<i>Cash Flow Parent (in %)</i>	35,807	8.18	5.00	5.15	7.65	11.11
Panel C: Repat Tax						
<i>Investment (in %)</i>	12,663	0.441	7.95	-2.18	-0.25	1.386
<i>PE Ratio</i>	12,663	17.48*	7.56	12.7	16.05	19.95
<i>Repat Tax Rate (in %)</i>	12,663	7.86	5.54	3.6	7	10.69
<i>Repat Tax Dummy</i>	12,663	1	0	1	1	1
<i>RoA (in %)</i>	12,663	6.42*	12.5	0.67	5.36	12.24
<i>Size</i>	12,663	9.96*	1.61	8.82	9.93	11.07
<i>Tangibility (in %)</i>	12,663	21.98*	23.04	3.54	12.59	34.91
<i>Total Participation (in %)</i>	12,663	95.16	12.72	99.99	100	100
<i>Cash Ratio Subsidiary (in %)</i>	12,663	15.12*	18.53	1.48	7.42	22.41
<i>Cash Flow Parent (in %)</i>	12,663	9.42*	5.57	5.86	8.94	12.64
Panel D: Data on Corporate Structures						
<i># of Unique Subsidiaries</i>	10,629					
<i># of Unique Ultimate Owners (UO)</i>	2,714					
<i># of Subsidiary Years per UO</i>		17.86	32.07	3	8	18
<i># of Subsidiaries per UO</i>		3.92	6.29	1	2	4

Note: All observations are on the subsidiary level (unless indicated otherwise). * denotes statistically significant differences, at the 5% level (two-tailed) between the subsamples of subsidiaries not subject to/subject to repatriation taxes.

Table 2: MNC and Subsidiary Countries

Panel A: No Repatriation Tax					
<i>Parent Country</i>	N	%			
<i>Japan</i>	7,536	15.5%	<i>British Virgin Islands</i>	13	0.0%
<i>Germany</i>	5,235	10.8%	<i>Cyprus</i>	13	0.0%
<i>France</i>	3,452	7.1%	<i>Macedonia</i>	13	0.0%
<i>Sweden</i>	3,122	6.4%	<i>Turkey</i>	13	0.0%
<i>U.K.</i>	2,735	5.6%	<i>Malta</i>	10	0.0%
<i>Switzerland</i>	2,630	5.4%	<i>Gibraltar</i>	8	0.0%
<i>Italy</i>	1,304	2.7%	<i>Serbia</i>	8	0.0%
<i>Netherlands</i>	1,302	2.7%	<i>Barbados</i>	6	0.0%
<i>Spain</i>	1,119	2.3%	<i>Russia</i>	5	0.0%
<i>Finland</i>	1,060	2.2%	<i>Peru</i>	4	0.0%
<i>Luxembourg</i>	739	1.5%	<i>Liechtenstein</i>	3	0.0%
<i>Norway</i>	727	1.5%	<i>Morocco</i>	3	0.0%
<i>Ireland</i>	674	1.4%	<i>Qatar</i>	3	0.0%
<i>Belgium</i>	614	1.3%	<i>Chile</i>	2	0.0%
<i>Canada</i>	455	0.9%	<i>Brazil</i>	1	0.0%
<i>Taiwan</i>	408	0.8%	Total	35,807	73.9%
<i>Austria</i>	406	0.8%	Panel B: Repatriation Tax		
<i>Denmark</i>	386	0.8%	<i>Parent Country</i>	N	%
<i>Korea</i>	314	0.6%	U.S.	9,797	20.2%
<i>Australia</i>	209	0.4%	Japan	1,837	3.8%
<i>U.S.</i>	174	0.4%	India	384	0.8%
<i>South Africa</i>	119	0.2%	U.K.	296	0.6%
<i>Israel</i>	110	0.2%	Korea	114	0.2%
<i>Poland</i>	110	0.2%	China	52	0.1%
<i>Bermuda</i>	99	0.2%	Taiwan	48	0.1%
<i>China</i>	93	0.2%	Greece	43	0.1%
<i>Singapore</i>	86	0.2%	Israel	35	0.1%
<i>Hungary</i>	82	0.2%	Brazil	29	0.1%
<i>Portugal</i>	62	0.1%	Croatia	21	0.0%
<i>New Zealand</i>	47	0.1%	Pakistan	4	0.0%
<i>Iceland</i>	41	0.1%	Ireland	1	0.0%
<i>India</i>	40	0.1%	New Zealand	1	0.0%
<i>Malaysia</i>	39	0.1%	Peru	1	0.0%
<i>Croatia</i>	34	0.1%	Total	12,663	26.1%
<i>United Arab Emirates</i>	34	0.1%			
<i>Greece</i>	28	0.1%			
<i>Hong Kong</i>	25	0.1%			
<i>Slovenia</i>	19	0.0%			
<i>Thailand</i>	17	0.0%			
<i>Mauritius</i>	16	0.0%			

Panel C: Subsidiaries							
<i>Subsidiary Country</i>	N	% of sample	% with Rep. Tax				
<i>U.K.</i>	7,277	15.0%	43.4%	<i>Singapore</i>	683	1.4%	31.9%
<i>France</i>	6,411	13.2%	23.1%	<i>Austria</i>	650	1.3%	18.3%
<i>Germany</i>	4,464	9.2%	26.8%	<i>Australia</i>	572	1.2%	25.7%
<i>Italy</i>	3,637	7.5%	22.0%	<i>Greece</i>	572	1.2%	19.8%
<i>Spain</i>	3,548	7.3%	25.9%	<i>Colombia</i>	570	1.2%	42.3%
<i>Poland</i>	2,878	5.9%	19.2%	<i>Philippines</i>	378	0.8%	25.1%
<i>Belgium</i>	2,559	5.3%	22.5%	<i>Bulgaria</i>	372	0.8%	20.4%
<i>Sweden</i>	1,932	4.0%	25.8%	<i>Croatia</i>	361	0.7%	13.9%
<i>Norway</i>	1,346	2.8%	16.0%	<i>Slovenia</i>	361	0.7%	13.6%
<i>Czech Republic</i>	1,328	2.7%	17.5%	<i>Ireland</i>	358	0.7%	45.8%
<i>Korea</i>	1,095	2.3%	23.7%	<i>India</i>	351	0.7%	18.5%
<i>Finland</i>	1,077	2.2%	20.7%	<i>Denmark</i>	203	0.4%	15.3%
<i>Portugal</i>	1,047	2.2%	19.3%	<i>Turkey</i>	146	0.3%	17.8%
<i>Netherlands</i>	903	1.9%	33.3%	<i>Luxembourg</i>	27	0.1%	59.3%
<i>China</i>	900	1.9%	14.3%	<i>Taiwan</i>	17	0.0%	23.5%
<i>Hungary</i>	892	1.8%	25.3%	<i>Malta</i>	15	0.0%	0.0%
<i>Romania</i>	834	1.7%	20.5%	<i>Brazil</i>	12	0.0%	25.0%
<i>Russia</i>	685	1.4%	15.0%	<i>Morocco</i>	5	0.0%	20.0%
				<i>Cyprus</i>	4	0.0%	0.0%
				Total	48,470	100%	

Note: Panel A presents observations of MNCs resident in countries with a territorial tax system, i.e. they do not face repatriation taxes on income earned in foreign subsidiaries. Panel B presents observations of MNCs resident in countries with a worldwide tax system, i.e. they face repatriation taxes on income earned in foreign subsidiaries. The U.K. and Japan are present in both Panels because they switched from a worldwide to a territorial system in 2009. Panel C presents observations of foreign subsidiaries. We present information as a fraction of the total sample as well as on the share of observations subject to repatriation taxes.

Table 3: Subsidiary Cash Ratio and Repatriation Taxes

Variables	Prediction	(1)	(2)	(3)	(4)
		Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
		Repat Tax			
		Dummy	Continuous		
<i>Repat Tax</i>	+	1.222** (0.472)	1.252** (0.484)	0.075** (0.034)	0.082** (0.038)
<i>RoA</i>		0.163*** (0.012)	0.164*** (0.012)	0.164*** (0.012)	0.165*** (0.012)
<i>Size</i>		-1.985*** (0.126)	-1.985*** (0.127)	-1.976*** (0.124)	-1.976*** (0.125)
<i>Tangibility</i>		-0.174*** (0.007)	-0.174*** (0.007)	-0.174*** (0.007)	-0.174*** (0.007)
<i>Total Participation</i>		0.021* (0.011)	0.021* (0.011)	0.020* (0.011)	0.020* (0.012)
Observations		48,456	48,298	48,456	48,298
Adjusted R ²		0.178	0.170	0.178	0.170
Country-Industry FE		YES	NO	YES	NO
Year FE		YES	NO	YES	NO
Country-Industry-Year FE		NO	YES	NO	YES

$$CashRatio_{i,t} = \alpha_{c,j} + \alpha_t + \beta_1 RepatTax_{c,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (2)$$

Note: This table presents regression results based on Equation (2). The dependent variable is the subsidiary's cash ratio. We report the results for an indicator variable (Columns 1 and 2) and the continuous measure (Columns 3 and 4) for $RepatTax_{c,t}$. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 4: Investment and PE-Ratio

		(1)	(2)	(3)
		Coef. (SE)	Coef. (SE)	Coef. (SE)
Variables	Prediction (1) (2) (3)	Full sample	No Repat Tax	Repat Tax
PE	+ + ?	0.025** (0.012)	0.032** (0.013)	-0.000 (0.017)
<i>RoA</i>		0.056*** (0.004)	0.055*** (0.005)	0.057*** (0.007)
<i>Size</i>		0.123*** (0.037)	0.118*** (0.040)	0.138** (0.067)
<i>Tangibility</i>		0.041*** (0.004)	0.042*** (0.004)	0.044*** (0.006)
<i>Total Participation</i>		0.004 (0.005)	-0.004 (0.004)	0.023** (0.011)
<i>Cash Flow Parent</i>		0.017** (0.007)	0.026*** (0.009)	-0.012 (0.011)
Observations		48,456	35,796	12,648
Adjusted R ²		0.060	0.062	0.071
Country-Industry FE		YES	YES	YES
Year FE		YES	YES	YES
Country-Industry-Year FE		NO	NO	NO

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (3)$$

Note: This table presents regression results based on Equation (3). The dependent variable is subsidiary investment. We split the sample based on whether the subsidiary is not (Column 2) or is (Column 3) subject to repatriation taxes. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 5: Baseline Results

Variables	Prediction	(1)	(2)
		Coef. (SE)	Coef. (SE)
		Repat Tax	
		Dummy	Continuous
<i>Repat Tax</i>	+	0.376 (0.261)	0.040* (0.022)
<i>Repat Tax*PE</i>	-	-0.031** (0.014)	-0.003*** (0.001)
<i>RoA</i>		0.052*** (0.004)	0.052*** (0.004)
<i>Size</i>		0.098*** (0.036)	0.097*** (0.036)
<i>Tangibility</i>		0.040*** (0.004)	0.040*** (0.004)
<i>Total Participation</i>		0.004 (0.005)	0.004 (0.005)
<i>Cash Flow Parent</i>		0.019** (0.007)	0.018** (0.007)
Observations		48,298	48,298
Adjusted R ²		0.087	0.087
Country-Industry FE		NO	NO
Year FE		NO	NO
Country-Industry-Year FE		YES	YES

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,t} + \beta_3 RepatTax_{c,t} * PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (1)$$

Note: This table presents regression results based on Equation (1). The dependent variable is subsidiary investment. We report the results for an indicator variable (Columns 1 and 2) and the continuous measure (Columns 3 and 4) for $RepatTax_{c,t}$. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 6: Cross Sectional Results (Monitoring Split)

Variables	Prediction (1) (2)	PANEL A		PANEL B		PANEL C	
		(1)	(2)	(1)	(2)	(1)	(2)
		Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
		Industry		Ownership		Corporate Governance	
		Same	Different	100%	<100%	High	Low
<i>Repat Tax</i>	? +	0.081 (0.420)	0.497 (0.408)	0.356 (0.308)	0.268 (0.483)	-0.117 (0.299)	1.129*** (0.361)
<i>Repat Tax*PE</i>	? -	-0.007 (0.024)	-0.035* (0.021)	-0.020 (0.016)	-0.047* (0.027)	-0.000 (0.016)	-0.071*** (0.013)
<i>RoA</i>		0.062*** (0.007)	0.045*** (0.005)	0.050*** (0.004)	0.055*** (0.007)	0.050*** (0.005)	0.055*** (0.007)
<i>Size</i>		0.154*** (0.055)	0.044 (0.043)	0.066 (0.042)	0.127** (0.061)	0.055 (0.044)	0.166** (0.064)
<i>Tangibility</i>		0.040*** (0.006)	0.042*** (0.003)	0.047*** (0.004)	0.030*** (0.006)	0.044*** (0.005)	0.031*** (0.005)
<i>Total Participation</i>		0.009 (0.008)	-0.003 (0.004)			0.009 (0.009)	0.027* (0.014)
<i>Cash Flow Parent</i>		0.016 (0.016)	0.018** (0.008)	0.012 (0.009)	0.041*** (0.016)	-0.006 (0.004)	0.016 (0.010)
Observations		19,375	28,709	33,810	14,240	28,212	15,579
Adjusted R ²		0.111	0.073	0.084	0.111	0.073	0.096
Country-Industry FE		NO	NO	NO	NO	NO	NO
Year FE		NO	NO	NO	NO	NO	NO
Country-Industry-Year FE		YES	YES	YES	YES	YES	YES

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,t} + \beta_3 RepatTax_{c,t} * PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (1)$$

Note: This table presents regression results based on Equation (1). The dependent variable is subsidiary investment. In Panel A, we split the sample based on whether the parent and the subsidiary operate in the same (Column 1) or different (Column 2) industry based on 1-digit NACE codes. In Panel B, we split the sample based on whether the subsidiary is wholly owned (Column 1) or partially owned (Column 2). In Panel C, we split the sample into subsidiary countries with high quality corporate governance mechanisms (Column 1) and countries with low quality corporate governance mechanisms based on the World Bank's Corporate Governance Indicator. We report the results for an indicator variable for $RepatTax_{c,t}$. Unreported test suggest similar results for the continuous measure for $RepatTax_{c,t}$. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 7: Cross Sectional Results (Financial Constraints)

Variables	Prediction (1) (2)	(1)	(2)
		Parent financially constrained	
		Coef. (SE)	Coef. (SE)
		Yes	No
<i>Repat Tax</i>	? +	0.048 (0.336)	0.547* (0.324)
<i>Repat Tax*PE</i>	? -	-0.008 (0.016)	-0.041** (0.017)
<i>RoA</i>		0.048*** (0.007)	0.055*** (0.005)
<i>Size</i>		0.101** (0.050)	0.098** (0.045)
<i>Tangibility</i>		0.035*** (0.005)	0.044*** (0.004)
<i>Total Participation</i>		-0.004 (0.008)	0.007 (0.005)
<i>Cash Flow Parent</i>		0.010 (0.022)	0.025** (0.010)
Observations		16,631	31,465
Adjusted R ²		0.078	0.095
Country-Industry FE		NO	NO
Year FE		NO	NO
Country-Industry-Year FE		YES	YES

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,t} + \beta_3 RepatTax_{c,t} * PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (1)$$

Note: This table presents regression results based on Equation (1). The dependent variable is subsidiary investment. We split the sample based on whether parent is (Column 1) or is not (Column 2) financially constrained. We classify a parent-year as financially constrained (unconstrained) with a cash-flow-to-total-assets-ratio in the lowest (highest) tercile in a country-industry. We report the results for an indicator variable for $RepatTax_{c,t}$. Unreported tests suggest similar results for the continuous measure for $RepatTax_{c,t}$. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 8: Sensitivity Analysis

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
		Dependent Variable: Gross Investment		Subsidiary Cash-ratio as Control		Worldwide Systems: U.S. parents only		Worldwide Systems: U.S. parents excluded	
		Repat Tax		Repat Tax		Repat Tax		Repat Tax	
		Dummy	Continuous	Dummy	Continuous	Dummy	Continuous	Dummy	Continuous
<i>Repat Tax</i>	+	0.076 (0.275)	0.027 (0.026)	0.380 (0.264)	-0.009*** (0.003)	0.322 (0.273)	0.043 (0.030)	0.607 (0.445)	0.029 (0.032)
<i>Repat Tax*PE</i>	-	-0.030** (0.015)	-0.003** (0.001)	-0.031** (0.014)	0.040* (0.022)	-0.027* (0.014)	-0.003* (0.001)	-0.050** (0.022)	-0.003*** (0.001)
<i>RoA</i>		0.050*** (0.005)	0.050*** (0.005)	0.054*** (0.004)	0.054*** (0.004)	0.050*** (0.004)	0.050*** (0.004)	0.053*** (0.005)	0.053*** (0.005)
<i>Size</i>		-0.183*** (0.043)	-0.188*** (0.043)	0.082** (0.037)	0.080** (0.037)	0.098*** (0.035)	0.097*** (0.035)	0.107*** (0.040)	0.107*** (0.040)
<i>Tangibility</i>		0.124*** (0.005)	0.124*** (0.005)	0.040*** (0.004)	0.040*** (0.004)	0.040*** (0.004)	0.040*** (0.004)	0.040*** (0.004)	0.040*** (0.004)
<i>Total Participation</i>		0.004 (0.006)	0.004 (0.006)	0.005 (0.005)	0.005 (0.005)	0.005 (0.005)	0.005 (0.005)	-0.005 (0.004)	-0.005 (0.004)
<i>Cash Flow Parent</i>		0.083*** (0.010)	0.080*** (0.010)	0.019** (0.007)	0.018** (0.007)	0.023*** (0.007)	0.022*** (0.007)	0.026*** (0.009)	0.026*** (0.009)
<i>Cash-ratio Subsidiary</i>				-0.009*** (0.003)	-0.009*** (0.003)				
Observations		43,099	43,099	46,975	46,975	43,370	43,370	38,339	38,339
Adjusted R ²		0.167	0.167	0.088	0.088	0.082	0.082	0.094	0.094
Country-Industry FE		NO	NO	NO	NO	NO	NO	NO	NO
Year FE		NO	NO	NO	NO	NO	NO	NO	NO
Country-Industry-Year FE		YES	YES	YES	YES	YES	YES	YES	YES

$$Investment_{i,t} = \alpha_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,t} + \beta_3 RepatTax_{c,t} * PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \varepsilon_{i,t} \quad (1)$$

Note: This table presents regression results based on Equation (1). The dependent variable is subsidiary investment (Columns 3 to 8) and subsidiary investment adjusted for annual depreciation (Columns 1 and 2). We report the results for an indicator variable (Columns 1, 3, 5, and 7) and the continuous measure (Columns 2, 4, 6, and 8) for $RepatTax_{c,t}$. Column 3 and 4 include subsidiary-level cash ratios as additional control variable. We include U.S. parents only (exclude U.S. parents) and report the results in column 5 and 6 (column 7 and 8). Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 9: Tax Reforms in the U.K. and Japan

Variables	Prediction	(1)	(2)	(3)	(4)
		Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
		U.K. vs. U.S. 2008-2009		Japan vs. U.S. 2008-2009	
<i>Country*Post*PE</i>	+	0.324* (0.188)	0.356* (0.208)	0.234*** (0.085)	0.304*** (0.109)
<i>Country*Post</i>	-	-5.707* (3.145)	-4.887 (3.693)	-2.447* (1.371)	-3.468* (1.767)
<i>PE</i>	+	0.062 (0.046)		0.057 (0.043)	
<i>Country*PE</i>		-0.235** (0.100)	-0.233** (0.112)	-0.159** (0.068)	-0.179** (0.073)
<i>Post*PE</i>		-0.079 (0.062)		-0.075 (0.058)	
<i>Country</i>		4.508** (2.047)	3.366 (2.312)	1.788 (1.178)	2.090 (1.404)
<i>Post</i>		3.218*** (1.161)		3.300*** (1.055)	
<i>RoA</i>		0.039 (0.025)	0.042 (0.026)	0.075*** (0.017)	0.070*** (0.018)
<i>Size</i>		-0.345* (0.177)	-0.184 (0.197)	-0.056 (0.104)	0.009 (0.117)
<i>Tangibility</i>		0.115*** (0.017)	0.116*** (0.019)	0.070*** (0.010)	0.077*** (0.010)
<i>Total Participation</i>		0.044* (0.026)	0.049 (0.030)	0.029** (0.013)	0.032** (0.013)
<i>Cash Flow Parent</i>		-0.038 (0.036)	-0.032 (0.034)	-0.008 (0.026)	-0.007 (0.027)
Observations		3,579	3,533	5,035	4,984
Adjusted R ²		0.044	0.067	0.042	0.072
Country-Industry FE		NO	NO	NO	NO
Year FE		NO	NO	NO	NO
Country-Industry-Year FE		NO	YES	NO	YES

$$Investment_{i,t} = \alpha + \beta_1 PE_{c,j,t} + \sum \beta_k Control_{i,t}^k + \beta_3 Country_c + \beta_4 Post_t + \beta_5 Country_c * Post_t + \beta_6 Country_c * PE_{c,j,t} + \beta_7 Post_t * PE_{c,j,t} + \beta_8 Country_c * Post_t * PE_{c,j,t} + \varepsilon_{i,t} \quad (4)$$

Note: This table presents regression results based on Equation (4). The dependent variable is subsidiary investment. *Country* indicates that the foreign subsidiary is owned by a U.K. or Japan MNC, respectively. *Post* indicates the period after the tax reform in the U.K. and Japan, i.e. after 2009. Standard errors are clustered on the subsidiary country-industry level and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).