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Repatriation Taxes, Internal Agency Conflicts, and Subsidiary-level Investment Efficiency

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Keywords: repatriation tax, agency conflicts, investment efficiency, internal capital

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Abstract

Using a global sample of multinational corporations (MNCs) and their foreign subsidiaries, we find that repatriation taxes impair subsidiary-level investment efficiency. Consistent with internal agency conflicts between the central management of the MNC and the manager of the foreign subsidiary being the driver, we find that this effect is prevalent in subsidiaries with high information asymmetry, in subsidiaries that are weakly monitored, and subsidiaries of cash-rich MNCs. Natural experiments in the UK and Japan establish a causal relationship for our findings and suggest that a repeal of repatriation taxes increases subsidiary-level investment *efficiency* while reducing the *level* of investment. Our paper provides timely empirical evidence to inform expectations for the effects of a recent change to the U.S. international tax law which eliminated repatriation taxes from most of the future foreign earnings of U.S. MNCs.

Keywords: repatriation tax, agency conflicts, investment, internal capital

JEL classification: H21, H25, F23, G31

I. INTRODUCTION

When the earnings of a foreign subsidiary of a multinational corporation (MNC) are repatriated as a dividend to the parent, they may be taxed in the parent's country. Although such repatriation taxes are a potential friction in an MNC's internal capital market, little is known about whether and under what conditions they affect the capital allocation decisions and investment behavior of foreign subsidiaries.¹ Moreover, while prior research shows that repatriation taxes provide an incentive to hold cash abroad (Foley, Hartzell, Titman, and Twite 2007), the implications of these cash holdings for investment decisions of particular foreign subsidiaries remain unexplored. In this study, we investigate the effect of repatriation taxes on foreign subsidiary-level investment efficiency. Understanding the effect of repatriation taxes on subsidiary investment is important because, even if they are levied by the parent country, these taxes could affect investment decisions of subsidiaries located abroad. The investment consequences of repatriation taxes are therefore relevant for policymakers in the parent and the subsidiary countries.

We view the MNC in a principal-agent framework in which central management acts as the principal and the manager of the foreign subsidiary as the agent. Absent informational frictions and goal conflicts, the principal allocates capital by "picking winners" among its subsidiaries (Stein 1997, 2003) and the agent invests the allocated capital in value-maximizing projects (Stein

¹ Payments from a foreign subsidiary to its parent can trigger taxes levied by the subsidiary country (e.g., withholding tax), the parent country (e.g., corporate income tax), or both. Empirically, our focus in this paper is on the corporate income tax that is paid by the parent in its home country when it repatriates the earnings of its foreign subsidiaries as a dividend while our findings also hold for other types of repatriation taxes. 15 of the 56 parent countries in our sample levied a corporate income repatriation tax for all or part of our sample period. The U.S., which levied a repatriation tax throughout our sample period, altered how U.S. tax will be assessed on foreign earnings of U.S. MNCs for years after 2017. Beginning in 2018, foreign earnings will generally be exempt from incremental U.S. tax (except for an immediate minimum corporate income tax on earnings in low-tax countries). Given this change, our study is 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. This is so for two reasons. First, withholding taxes on cross-border payments of dividends, interest, and royalties are common under most international tax regimes. Second, repatriation taxes are a common tool used in the base erosion prevention measures implemented by parent countries (e.g., as an element of *Controlled Foreign Corporation (CFC) Rules*), so significant portions of foreign earnings are likely to remain subject to repatriation taxes.

2002). The presence of asymmetric information and goal conflicts, however, implies internal agency conflicts between the central management and the subsidiary manager over how to deploy capital, facilitating self-interested investment behavior by the agent (Jensen and Meckling 1976; Stein 2003). Such conflicts are common within an MNC because individual subsidiaries are shielded from takeover pressures (Cusatis, Miles, and Woolridge 1993) and subsidiary managers are less likely to receive high-powered equity incentives (Schipper and Smith 1986; Aggarwal and Samwick 2003).

Central management can limit the capital available in the subsidiary by repatriating its earnings to the parent as a dividend (Chetty and Saez 2010). However, repatriation taxes make paying a cross-border dividend costly. These taxes incentivize central management to forego dividends and to leave capital in the subsidiary (Foley et al. 2007), providing the subsidiary manager with excess cash (Beyer, Downes, and Rapley 2017; Laplante and Nesbitt, 2017). In the presence of internal agency conflicts, the subsidiary manager may invest this cash in “pet” projects which yield personal utility for the manager instead of in projects that maximize shareholder value. Such behavior leads to less efficient investment by the subsidiary (Chetty and Saez 2010). Based on these arguments, we predict that repatriation taxes distort the allocation of internal capital and reduce subsidiary-level investment efficiency. Further, we predict that internal agency conflicts between the central management and the manager of the foreign subsidiary drive this effect.

There are, however, several reasons that we would not observe an effect of repatriation taxes on subsidiary-level investment efficiency. First, even in the presence of repatriation taxes, central management might efficiently reallocate capital among its subsidiaries by means of intra-firm payments (Murphy 2017). Second, central management could reduce information asymmetry and ensure effective monitoring by exploiting external information (Shroff, Verdi, and Yu 2014) or by

implementing information-sharing technology between the central management and the subsidiary manager (Bloom, Sadun, and Van Reenen 2012). Third, central management, in anticipation of the internal agency conflict, might ex-ante provide the subsidiary manager with insufficient capital (Myers and Majluf 1984). Leaving cash abroad because of repatriation taxes could allow the subsidiary manager to exploit more value-maximizing projects, suggesting an increase in investment efficiency. As such, our prediction represents an empirical question.

To test our prediction, we examine the sensitivity of subsidiary-level investment to local growth opportunities, which we refer to as investment efficiency (Badertscher, Shroff, and White 2013; Shroff et al. 2014). More specifically, we test whether this sensitivity is weaker for subsidiaries whose earnings are subject to repatriation taxes than for their peers in the same country-industry with earnings not subject to such taxes (see Figure 1). We interpret a weaker sensitivity as consistent with repatriation taxes leading to lower investment efficiency. Our sample is based on unconsolidated financial statement data from Bureau van Dijk's Orbis database for the years 2007 to 2014 and includes operating subsidiaries in 37 countries. The subsidiaries are owned by MNCs domiciled in 56 countries, 15 of which levy repatriation taxes for all or part of our sample period (e.g., U.S., UK, Japan, India, and South Korea). By using a research design with extensive fixed effects, we exploit this variation and identify the effect of repatriation taxes from variation across subsidiaries and time within a country-industry.

We find that repatriation taxes are negatively associated with subsidiary-level investment efficiency. This effect is economically significant: for the average subsidiary whose earnings face repatriation taxes, a one standard deviation change in local growth opportunities is associated with a 0.12 percentage point weaker reaction in investment. When evaluated at the mean investment, this effect translates into a 27.1 percent weaker sensitivity of investment to local growth

opportunities.² We interpret this finding, which holds across multiple specifications and robustness tests, as evidence that investment efficiency is decreasing in repatriation taxes.

To test whether internal agency conflicts drive these results, we first examine whether the effect of repatriation taxes on investment efficiency is concentrated in subsidiaries with high information asymmetry between central management and the subsidiary manager. Informational frictions reduce the ability of central management to verify the subsidiary's local growth opportunities. In addition, central management is less able to monitor and to incentivize the subsidiary manager (e.g., Björkman Barner-Rasmussen, and Li 2004; Mian 2006; Bell, Filatotchev, and Rasheed 2012; Denk, Kaufmann, and Roesch 2012). Using three different proxies for information asymmetry, we find support for our expectation: the negative effect of repatriation taxes on investment efficiency is concentrated in subsidiaries subject to high information asymmetry. We next examine subsidiaries that are weakly monitored by central management as low monitoring increases the opportunities of the subsidiary manager to invest in pet projects (Chetty and Saez 2010). The results are again consistent with our expectation: the negative effect of repatriation taxes on investment efficiency is concentrated in subsidiaries subject to high monitoring costs and, therefore, a low level of monitoring. Collectively, these results are consistent with internal agency conflicts driving our main results.

To shed light on the characteristics of subsidiaries affected by repatriation taxes, we test whether the effect of repatriation taxes on investment efficiency depends on the amount of cash available to a subsidiary manager. Following Chetty and Saez (2010), we expect that repatriation taxes mainly impair the investment efficiency of subsidiaries of cash-rich MNCs. Consistent with

² Mean investment equals 0.45 percent as we scale investment (i.e., the annual change in fixed assets) by lagged total assets. When scaling by lagged fixed assets rather than total assets, we obtain a mean investment of 14.8 percent.

this prediction, the negative effect of repatriation taxes on investment efficiency is limited to subsidiaries with large cash holdings and to MNCs with ample internal capital. We conclude from this that the availability of excess cash to the subsidiary manager facilitates the negative effect of repatriation taxes on investment efficiency.

In addition to our findings on the effects of repatriation taxes on investment *efficiency*, we find some evidence that repatriation taxes are related to a higher *level* of investment. That is, managers of subsidiaries facing repatriation taxes are less likely to terminate unprofitable projects and more likely to invest in pet projects (Jensen 1986; Chetty and Saez 2010). This evidence suggests that the investment inefficiency found in our main tests is a result of *over*-investment.

Finally, we exploit two natural experiments provided by tax reforms in the UK and Japan. Both countries repealed repatriation taxes on foreign earnings in 2009, providing an exogenous shock to repatriation taxes that allows a difference-in-differences (DiD) analysis (Arena and Kutner 2015; Xing 2018).³ We compare the investment efficiency of foreign subsidiaries of British and Japanese MNCs to that of foreign subsidiaries of U.S. MNCs, whose earnings are subject to repatriation taxes throughout the sample period. While the level of investment of British and Japanese subsidiaries decreased after the reform, the efficiency of investment increased. In other words, the repeal of repatriation taxes led to a reduction in inefficient over-investment, corroborating a causal interpretation of the effect found in our main tests.

Our study contributes to several streams of research. First, we expand research on the economic consequences of repatriation taxes (e.g., Foley et al. 2007; Nessa 2016; Blouin, Krull, and Robinson 2017; Gu 2017). Prior studies find that repatriation taxes facilitate value-destroying

³ The difference-in-differences design appears to provide the cleanest identification of the effects we are interested in. However, because these settings have some limitations (see Section VI), we present these tests as supplemental rather than primary.

M&A choices made by the central management of an MNC (Hanlon, Lester, and Verdi 2015; Edwards, Kravet, and Wilson 2015; Harford, Wang, and Zhang 2017) and implicitly attribute this result to first-tier agency conflicts between an MNC's central management and its shareholders (Graham, Harvey, and Rajgopal 2005). Our study, in contrast, is the first to link repatriation taxes to investment decisions at the foreign subsidiary level.⁴ In the presence of first-tier agency conflicts, central management pursues its own pet projects, such as empire building through M&A. Because central management and subsidiary managers compete over available capital, central management has incentives to monitor the investment decisions of subsidiary managers and to demand economically optimal investment behavior (Scharfstein and Stein 2000; Stein 2003). Our study suggests that *internal* agency conflicts constitute a distinct driver of the negative effect of repatriation taxes on subsidiary-level investment efficiency. In this regard, our results provide an investment-based explanation for the valuation discount of foreign cash holdings (Yang 2014) and the variation in the earnings persistence of foreign cash changes (Chen, Chiu, and Shevlin 2018).

Second, our study expands research on the efficiency of the internal capital markets of MNCs (e.g., Shin and Stulz 1998; Rajan et al. 2000; Glaser et al. 2013; Beyer et al. 2017; De Simone, Klassen, and Seidman 2018). While prior research focuses on the mechanisms MNCs adopt to mitigate internal agency conflicts, such as strategically assigning decision rights (Antràs, Desai, and Foley 2009), restricting subsidiaries' capital budgets (Bernardo, Cai, and Luo 2004), or drawing on external information to monitor subsidiary managers (Shroff et al. 2014), our findings suggest that repatriation taxes aggravate these conflicts, leading to lower investment efficiency.

⁴ In supplemental tests in their respective papers, Hanlon et al. (2015) document a positive association between repatriation taxes and the level of foreign capital expenditures, and Harford et al. (2017) find that cash-rich firms are more likely to make value-reducing foreign capital expenditures. Both of these tests are conducted at the MNC level and are designed to capture investments made by the central management and not investment decisions made by foreign subsidiary managers.

Thus, repatriation taxes imply a trade-off for central management between agency costs due to inefficient subsidiary-level investment and the costs of monitoring subsidiary managers.

Third, our findings inform the ongoing debate on the effect of repatriation taxes, as a form of dividend taxation, on investment. In exploiting an international setting, our study provides empirical support for the theoretical predictions of Chetty and Saez (2010) and suggests that dividend taxes reduce investment efficiency and facilitate over-investment, in particular by subsidiaries of MNCs prone to internal agency conflicts.⁵ Our study also informs expectations about the effects of changes to the U.S. international tax system. The recent tax reform eliminates repatriation taxes on most future foreign earnings. Our results indicate that this change removes a source of agency costs borne under the old system. To the extent this manifests, U.S. MNCs and their shareholders should benefit from efficiency gains while host countries of foreign subsidiaries may experience lower investment. Consequently, our findings should be of interest to policymakers, both in the U.S. and abroad.⁶

II. PRIOR RESEARCH AND HYPOTHESIS DEVELOPMENT

The Economic Effects of Repatriation Taxes

The home country of an MNC has the right to levy domestic tax on the earnings of foreign subsidiaries. Countries set their international tax laws on a spectrum between full exemption (i.e.,

⁵ The “old view” and the “new view” of dividend taxation provide conflicting predictions for the impact of dividend taxation on subsidiary-level investment. While the old view (Poterba and Summers 1984) predicts that repatriation taxes reduce the level of investment, the new view (King 1977; Auerbach 1979; Hartman 1985) predicts no effect. These classic models, however, do not allow for agency conflicts, which Chetty and Saez (2010) add to their model.

⁶ The expected negative effect of the TCJA on the level of investment could be partly offset by the Global Intangible Low Taxes Income (GILTI) and Foreign Derived Intangible Income (FDII) provisions. GILTI is a U.S. tax on excess foreign return that incentivizes capital expenditures abroad while FDII is a U.S. tax deduction for excess domestic return discouraging domestic investment. Similarly, the Base Erosion Anti-Abuse Tax (BEAT) provision, which is a minimum tax on intra-firm payments to non-U.S. subsidiaries, provides an incentive to relocate production facilities abroad.

the home country exempts foreign earnings from domestic tax) and full double-taxation (i.e., the home country levies domestic tax on foreign earnings and allows no credit for foreign taxes paid). Those closer to full exemption are usually grouped in a “territorial” category, and those nearer the other end are grouped in a “worldwide” category.⁷ In reality, exceptions and provisions in tax regimes result in all countries falling at different points along the spectrum. For example, until 2018, the U.S. used a worldwide tax system, but allowed the repatriation tax (i.e., the U.S. tax liability on foreign earnings, net of credit granted for foreign taxes paid) to be deferred until foreign earnings were repatriated to the U.S. parent. In contrast, a home country with a territorial tax system fully exempts foreign earnings from domestic tax and the repatriation tax is zero.⁸

Since repatriation taxes apply when foreign earnings are distributed to the parent, such taxes provide an incentive to defer repatriation and to hold cash abroad (Foley et al. 2007), accounting for 42 percent of the cash differential between U.S. MNCs and domestic firms under the pre-2018 law (Gu 2017).⁹ Additionally, deferring the repatriation of foreign earnings had a financial accounting benefit because, under U.S. GAAP, firms were not required to accrue a deferred tax expense for foreign earnings designated as permanently reinvested (Graham, Hanlon, and Shevlin 2011).¹⁰

⁷ Territorial tax systems are also referred to as “exemption” or “source-based” systems. Worldwide tax systems are also referred to as “credit” or “residence-based” systems. We use the terms territorial and worldwide in this paper.

⁸ Some countries, such as Italy or Germany, exempt 95 percent of foreign earnings (i.e., tax 5 percent). In addition, several countries impose repatriation taxes when certain conditions are met. France, for instance, taxes all foreign earnings that are repatriated from a CFC located in a country with an effective tax rate that is 50 percent lower than the current French corporate income tax rate of 33.33 percent. In such a case, France grants a credit for foreign taxes paid, which resembles a worldwide system. We follow Markle (2016) and treat the worldwide/territorial distinction as binary by classifying a country as territorial if it exempts 95 percent or more of foreign earnings.

⁹ Hartman (1985) shows theoretically that repatriation taxes do not affect an MNC’s decision to repatriate foreign earnings when the tax is constant over time and all foreign earnings will eventually be repatriated. In reality, repatriation taxes do affect repatriation decisions because expected repatriation taxes vary over time (e.g., due to tax holidays; see Altshuler, Newlon, and Randolph 1994; De Waegenaere and Sansing 2008). Moreover, an MNC is 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).

¹⁰ A similar rule exists in IAS 12, which is the prevailing accounting standard for MNCs resident outside the U.S.

Deferring the repatriation of foreign earnings, however, is costly as investors place a valuation discount on cash held abroad (Campbell, Dhaliwal, Krull, and Schwab 2014). Harford et al. (2017) show that this discount is driven by a combination of repatriation taxes, internal financing frictions, and agency costs. This result is consistent with Yang (2014), who reports a lower marginal value for foreign compared to domestic cash, and Chen et al. (2018), who find lower earnings persistence of cash changes if foreign growth opportunities are low and repatriation taxes are high.

By providing an incentive to hold cash abroad, repatriation taxes may also affect an MNC's investment decisions. Prior research focuses on M&A deals made by the central management and provides inconclusive results (Chen and Shevlin 2018). For the level of investment, Hanlon et al. (2015) show that repatriation taxes increase the likelihood of acquiring foreign rather than domestic targets, consistent with foreign investment increasing in repatriation taxes. Conversely, Feld, Ruf, Scheuering, Schreiber, and Voget (2016) find that the repeal of repatriation taxes in Japan and the UK led to more outbound acquisitions. With respect to domestic investment, Hanlon et al. (2015) find no relation between repatriation taxes and domestic M&A activity. In contrast, Harris and O'Brien (2018) document a negative relation between repatriation tax costs and the level of domestic M&A by U.S. firms while Martin, Rabier, and Zu (2015) find a positive association.

Edwards et al. (2016) find that repatriation taxes, in addition to affecting the level of investment, reduce the foreign investment opportunity set of MNCs, leading to less profitable

foreign M&A deals.¹¹ Similarly, shareholders of firms with high repatriation tax costs react negatively to the announcement of foreign M&A deals (Hanlon et al. 2015) and of foreign capital expenditure and acquisition plans (Harford et al. 2017). Both Hanlon et al. (2015) and Harford et al. (2017) attribute their results to agency conflicts between shareholders and the central management of an MNC over how to deploy foreign cash holdings, but neither study tests this assertion directly. Complementing these studies, Blouin et al. (2017) examine domestic investment and find that repatriation taxes reduce the sensitivity of domestic investment to domestic growth opportunities.

Baseline Hypothesis: Repatriation Taxes and Subsidiary-Level 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). Consequently, managers invest exclusively in projects with positive net present value, while returning excess cash to their capital providers. Such investment behavior maximizes shareholder value and is therefore considered economically efficient.

Within an MNC, asymmetric information and goal conflicts between the central management and the manager of a foreign subsidiary cause internal agency conflicts in the form of adverse selection or moral hazard (Desai, Foley, and Hines 2007) that distort the allocation of internal capital (Stein 1997). Such conflicts arise within the MNC as individual subsidiaries are shielded from takeover pressures (Cusatis et al. 1993). Further, goal conflicts are prevalent because

¹¹ Edwards et al. (2016) suggest that, under certain circumstances, lower-return acquisitions made with foreign cash holdings might be 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.

subsidiary managers are less likely to receive high-powered equity incentives based on the performance of the entire MNC (Schipper and Smith 1986; Aggarwal and Samwick 2003).

In the presence of internal agency conflicts, the subsidiary manager has two options to deploy available capital (Chetty and Saez 2010). First, the manager may invest in value-maximizing projects that increase shareholder value. Second, the manager may invest in pet projects that provide personal benefits while being of low value to shareholders. For instance, as a self-interested subsidiary manager consumes perks from running a larger business (Jensen 1986; Chetty and Saez 2010), the manager is both less likely to terminate unprofitable projects and more likely to overinvest in projects with low (or even negative) net present value (Jensen 1986).

In such a setting, central management can choose to limit the capital available in the subsidiary by repatriating its earnings to the parent as a dividend. However, repatriation taxes impose a cost on this option, which incentivizes central management to defer repatriation (Foley et al. 2007). This deferral results in the subsidiary manager receiving capital without competing for it in the MNC's internal capital market. In addition, the same forces increase the costs of monitoring the subsidiary for central management because alleviating internal agency concerns by increasing the leverage of the subsidiary becomes infeasible (Easterbrook 1984; Jensen 1986).

For all of these reasons, repatriation taxes provide a self-interested subsidiary manager with opportunities to reap personal benefits by shifting investment from value-maximizing projects to pet projects (Chetty and Saez 2010). Such investment behavior will be less efficient because it does not, in expectation, maximize shareholder value. In contrast, for an MNC that does not incur repatriation tax when distributing foreign earnings to the parent (as under a territorial tax system), central management can limit excess cash available for the subsidiary manager by having the subsidiary pay a dividend with no additional tax cost. Given these differences, we expect that

investment efficiency will be lower if a subsidiary's earnings are subject to repatriation taxes. This leads to our baseline hypothesis, stated in the alternative:

H1: *Subsidiary-level investment efficiency is decreasing in the repatriation taxes on a foreign subsidiary's earnings.*

Several arguments suggest that there is support for the null hypothesis. First, repatriation taxes are triggered when foreign earnings are distributed to the parent and are generally not incurred when earnings remain foreign or are moved to another subsidiary by means of intra-firm payments (Murphy 2017). In addition, if central management pursues its own pet projects, such as empire building through M&A deals (Hanlon et al. 2015; Harford et al. 2017), it has incentives to pool capital in subsidiaries under its direct control. To the extent that central management is able to efficiently reallocate capital among its subsidiaries, we will not observe our hypothesized relation because the individual subsidiaries will not be left with excess capital.¹² Second, since we argue that internal agency conflicts drive the effect on investment efficiency, the relation does not hold if central management is able to effectively monitor the subsidiary's investment decisions (Chetty and Saez 2010). In this regard, Shroff et al. (2014) show that external information facilitates monitoring and Bloom et al. (2012) find that improved information technology reduces informational frictions. Third, the theory of adverse selection suggests that central management anticipates the internal agency conflict and ex-ante provides the subsidiary manager with insufficient capital (Mayers and Majluf 1984). Leaving cash abroad because of repatriation taxes may allow the subsidiary manager to exploit more value-maximizing projects, suggesting a positive effect on investment efficiency.

¹² The Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA), for instance, enables U.S. MNCs to relocate foreign cash without triggering repatriation taxes (Murphy 2017). Since our data covers financial years as of 2006 (see Section III), we are unable to test whether this reform had a mitigating effect in our setting.

III. RESEARCH DESIGN, DATA, AND SAMPLE SELECTION

Research Design

To test whether investment efficiency is decreasing in repatriation taxes, we estimate the following subsidiary-level OLS regression:

$$\begin{aligned}
 Investment_{i,t} = & \alpha_c + \alpha_j + \alpha_t + \sum \beta_{c,j} \alpha_{c,j} * PE_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 RepatTax_{c,g,t} + \\
 & \beta_3 RepatTax_{c,g,t} * PE_{c,j,t} + \sum \beta_k SubsidiaryControl_{i,t}^k + \quad (1) \\
 & \sum \beta_m ParentControls_{p,t}^m + \sum \beta_n Internal^n * PE_{c,j,t} + \varepsilon_{i,t}
 \end{aligned}$$

where

i	is the subsidiary.
t	is the year.
c	is the subsidiary country.
j	is the subsidiary industry.
p	is the parent.
g	is the parent country.
$Investment_{i,t}$	is the subsidiary's annual change in net fixed assets scaled by lagged total assets. ¹³
$PE_{c,j,t}$	is the price-to-earnings ratio (PE-ratio) in the subsidiary's country-industry-year (one-digit ICB industry).
$RepatTax_{c,g,t}$	is a measure for repatriation taxes, calculated as: (continuous) the difference in statutory corporate tax rates between countries g and c. (indicator) 1 (0) if country g operates a worldwide (a territorial) tax system in year t.¹⁴
$SubsidiaryControls$	is a vector of subsidiary-level controls.
$ParentControls$	is a vector of parent-level controls.
$Internal$	is a vector of internal mechanisms to monitor subsidiary i .
α_c	are subsidiary country fixed effects.

¹³ $Investment_{i,t}$ measures the change in net fixed assets from year $t-1$ to t and approximates a subsidiary's capital expenditures net of annual depreciation charges (i.e. net investment in fixed assets). In contrast to Shroff et al. (2014), we do not use annual changes in *total* assets as our dependent variable because, consistent with prior research on investment efficiency (e.g., Biddle and Hilary 2006; Biddle, Hilary, and Verdi 2009), we are interested in *real* investment of a subsidiary, which is more directly measured with changes in net fixed assets. In additional tests, we adjust our measure and add back annual depreciation on fixed assets (i.e. gross investment in fixed assets). Results are qualitatively similar when using this measure.

¹⁴ We collect data on tax systems and corporate tax rates from EY Corporate Tax Guides. The continuous variable is equal to zero if the difference is negative or if the parent resides in a territorial tax system. For the indicator variable, we follow Markle (2016) and classify the tax system in which an MNC resides as territorial or worldwide.

α_j are subsidiary industry fixed effects.
 α_t are year fixed effects.
 $\alpha_{c,j}$ are subsidiary country-industry fixed effects.

Appendix A provides an overview of all variable definitions.

Equation (1) is a regression of investment on local growth opportunities (e.g., Badertscher et al. 2013; Shroff et al. 2014). β_1 captures the sensitivity of subsidiary-level investment to local growth opportunities, our measure for investment efficiency. If investment is responsive to local growth opportunities (i.e., efficient), we expect β_1 to be positive.¹⁵ To test for the effect of repatriation taxes on investment efficiency, we extend this model by adding $RepatTax_{c,g,t}$ and interacting it with $PE_{c,j,t}$. The coefficient on the interaction (β_3) is our coefficient of interest because it captures the investment efficiency of a subsidiary whose earnings are subject to repatriation taxes relative to a counterfactual whose earnings do not bear these taxes. A positive (negative) coefficient on β_3 indicates higher (lower) investment efficiency. Consistent with our prediction that repatriation taxes lead to less efficient investment, we expect β_3 to be negative.

We include several fixed effects in Equation (1). First, we add interactions of fixed effects for each subsidiary country-industry ($\alpha_{c,j}$) with $PE_{c,j,t}$.¹⁶ These interactions allow the sensitivity of subsidiary-level investment to local growth opportunities to vary by country-industry. Therefore, we control for time-invariant country-industry characteristics that could affect investment efficiency of all subsidiaries in a country-industry, such as the country-specific industry structure, financial-sector development, or the strength of property rights (Claessens and Laeven

¹⁵ In our main tests, we include interactions between each subsidiary country-industry fixed effect and $PE_{c,j,t}$. As β_1 captures the relation between investment and local growth opportunities for the country-industry excluded from the regression, we do not tabulate β_1 in our main tests (similar to Shroff et al. 2014). However, we test for and find a positive relation between investment and local growth opportunities in our sample (see Column 1 of Table 3).

¹⁶ Consistent with $PE_{c,j,t}$, the subsidiary country-industry fixed effects are based on one-digit ICB industries.

2003). Further, including these fixed effects rules out the possibility that country-industry-level measurement error in $PE_{c,j,t}$ might affect investment efficiency (Erickson and Whited 2000). Holding investment opportunities constant, repatriation taxes vary in our sample due to differences in the tax systems operated by the parent countries and due to changes in tax rates over time. Consequently, we identify the effect of repatriation taxes on investment efficiency from cross-subsidiary and cross-time variation within each country-industry. Considering the example in Figure 1, β_3 captures the investment efficiency of a Polish subsidiary of a U.S. MNC under the pre-2018 law relative to a Polish subsidiary of a Canadian MNC in the same industry.

INSERT FIGURE 1 HERE

Second, we include fixed effects for each subsidiary country (α_c) to control for country-level factors, such as legal or regulatory regimes, and fixed effects for each subsidiary industry (α_j) to control for industry-level factors, such as investment adjustment costs, that could affect the investment behavior of subsidiaries. Third, we add year fixed effects (α_t) to absorb the effect of economic shocks or the business cycle.

The vector *SubsidiaryControls* captures subsidiary-level characteristics prior research has shown to be associated with investment (e.g., Cummins, Hassett, and Hubbard 1996; Baker, Stein, and Wurgler 2003). We include the subsidiary's return-on-assets ($RoA_{i,t}$) to control for internally generated funds (Faulkender and Petersen 2012). $Size_{i,t}$ is the natural logarithm of total assets and captures differences in investment opportunities (Carpenter and Petersen 2002) and in the allocation of decision rights between the parent and the subsidiary (Robinson and Stocken 2013). We include $Tangibility_{i,t}$ to control for the stock of fixed assets (Biddle and Hilary 2006). Finally, we add the total amount of credit provided by the banking sector as a percentage of GDP

in the subsidiary country ($DomesticCredit_{c,t}$) to control for bank monitoring (Shroff et al. 2014).

The vector *ParentControls* includes parent-level characteristics that might affect subsidiary-level investment. We include $TotalParticipation_p$ as the sum of direct and indirect participation of the parent in the subsidiary. Parents set their ownership stakes in subsidiaries to align incentives between the central management and the subsidiary manager as well as to facilitate monitoring (Antràs et al. 2009). Additionally, we include the parent's cash-flow-to-total-assets ratio ($CashFlowParent_{p,t}$) as MNCs use internal capital markets to finance the investments of foreign subsidiaries (Shin and Stulz 1998; Arena and Kutner 2015).¹⁷

As outlined above, we include $DomesticCredit_{c,t}$, $TotalParticipation_p$, and $CashFlowParent_{p,t}$ to capture the effect of these variables on the level of investment. However, these variables also represent internal mechanisms available for central management to adopt to monitor the investment behavior of subsidiaries. As such, these variables, which we group into the vector *Internal*, could also be associated with subsidiary-level investment efficiency. To control for this, we follow Shroff et al. (2014) and interact the variables in the *Internal* vector with $PE_{c,j,t}$.

Data and Sample

We collect subsidiary-level unconsolidated financial statement data and parent-level consolidated financial statement data from Bureau van Dijk's Orbis database. Our dataset covers the years 2006 to 2014. As several variables, such as $Investment_{i,t}$, are annual changes, our final sample effectively includes the years 2007-2014. We use ownership information available in Orbis

¹⁷ In supplemental tests, we include the subsidiary's cash ratio as a proxy for internally generated funds available for investment. One concern with adding this variable to the baseline model is that the cash ratio could be a mediator or collider control (Swanquist and Whited 2018) because subsidiaries whose earnings are subject to repatriation taxes also report higher cash holdings; adding the cash ratio as variable can lead to bias (Gow, Larcker, and Reiss 2016). To address the concern of poor control variables in general, we run our regressions without control variables and find similar results (untabulated).

to re-construct MNCs' holding structures and to identify directly- and indirectly-held subsidiaries.¹⁸ Indirect shareholdings in our sample include subsidiaries held by intermediate subsidiaries that are located across up to four different countries. As repatriation taxes only apply in a cross-border context, we drop domestic subsidiaries.¹⁹ Further, we require a parent to hold a total participation of more than 50 percent in a single subsidiary to ensure that central management has control over the subsidiary and its decision to pay a dividend.²⁰

We follow prior research and exclude subsidiaries in the financial and utility sectors as well as non-operating financial holdings due to unique investment patterns (e.g., Badertscher et al. 2013). This limits our sample to operating subsidiaries. Moreover, we require non-missing values for all variables in Equation (1). To avoid denominator effects and to mitigate the influence of outliers in our dataset, we require total assets, operating revenue, and fixed assets of at least US\$10,000 and eliminate observations in the bottom and top 1.5 percent of the variable distribution (similar to Becker, Jacob, and Jacob 2013).²¹ We obtain a final sample of 48,470 subsidiary-years. Depending on the fixed-effects structure applied and the data available for our subsample tests, the sample size varies slightly across specifications. Appendix B provides an overview of the sample selection procedure.

To measure local growth opportunities, we follow Bekaert, Lundblad, and Siegel (2007) and

¹⁸ One limitation of the Orbis database is that ownership information is stale and reflects the status of the last year in the dataset. This feature might lead to measurement error as we could classify a firm that was acquired by an MNC towards the end of the sample period as being a foreign subsidiary throughout. As repatriation taxes only apply in a cross-border context, such ownership changes would bias against finding an effect of repatriation taxes on investment efficiency. Consequently, the effect size obtained from our baseline regression model likely constitutes a lower bound estimate.

¹⁹ Data on domestic subsidiaries of U.S. MNCs is not available so that we cannot compare investment behavior of U.S. foreign subsidiaries to their domestic counterparts.

²⁰ Our results are similar when requiring lower thresholds.

²¹ We randomly checked outliers and found that they either result from obvious errors in the database or from one-time changes in the subsidiary's asset structure likely initiated by the central management (e.g., initial investments or final disinvestments). Because we are interested in *continuous* investment decisions made by the manager of a subsidiary, we truncate rather than winsorize.

Shroff et al. (2014). We first collect monthly equity indices per one-digit ICB country-industry in which we observe subsidiary-level investment from Datastream. We then calculate annual PE-ratios by using the median ratio in year t . $PE_{c,j,t}$ is an intuitive measure for local growth opportunities as a higher ratio of share-price-to-earnings for firms in the same country-industry-year suggests that investors expect stronger industry-level growth. Another benefit of this variable is that it is exogenous to the subsidiaries in our sample. As PE-ratios require data of *public* (listed) firms in a country-industry-year, the *private* (unlisted) subsidiaries in our sample do not enter the calculation of $PE_{c,j,t}$.

Descriptive Statistics

Table 1 reports the number of parent-year and subsidiary-year observations in our sample by country. We observe the largest number of parents residing in large, developed countries, such as the U.S., Japan, Germany, France, Sweden, and the UK. We observe similar variation in the distribution of subsidiaries, with the UK, France, Germany, Italy, and Spain contributing the most observations. A sizable proportion of subsidiaries reside in Eastern European countries, such as in Poland and the Czech Republic, and in Asian countries, such as South Korea and China.

INSERT TABLE 1 HERE

Table 2 presents descriptive statistics. In Panel A, we present information for the full sample. The mean annual change in fixed assets amounts to 0.45 percent of total assets. The average PE-ratio is 17.8, which is consistent 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 capital in fixed assets. The average amount of credit provided by the banking sector is 105.9 percent of GDP. With respect to parent-level controls, the average cash-flow-to-assets

ratio is 8.5 percent and parents hold a mean participation of 95.1 percent in their subsidiaries.

In Panels B and C, we split the sample based on whether the subsidiary's earnings are subject to repatriation taxes. We test for differences between subsamples and do not find differences in means for our dependent variable ($Investment_{i,t}$), the PE-ratio ($PE_{c,j,t}$), and the total participation of the parent ($TotalParticipation_p$). For the remaining variables, means differ between subsamples, which indicates the need for controls in our multivariate analysis. In Panel D, we present information on the holding structures of the MNCs. In total, our sample includes 10,629 unique subsidiaries, controlled by 2,714 unique parents. On average, each parent holds 3.9 subsidiaries, which is equivalent to 17.9 subsidiary-year observations per parent.

In Panel E, we show data on $RepatTax_{c,g,t}$ by subsidiary country-industry based on one-digit ICB industries. $RepatTax_{c,g,t}$ varies substantially within country-industries, which is due to i) the tax system operated by the parent country and ii) the difference in corporate income tax rates between the parent and the subsidiary country. The tax system of the parent country varies because of tax reforms during the sample period.²² The difference in statutory corporate tax rates varies because of tax rate changes in the parent or the subsidiary country. The mean within-country-industry repatriation tax is 2.51 percent while the average standard deviation is 3.64 percent, indicating sufficient variation for our fixed-effects research design.

INSERT TABLE 2 HERE

²² Notably, both the UK and Japan switched from a worldwide to a territorial tax system and repealed repatriation taxes in 2009. We exploit these tax reforms as natural experiments in our supplemental tests (see Section VI).

IV. BASELINE RESULTS: REPATRIATION TAXES AND INVESTMENT EFFICIENCY

Before testing our baseline hypothesis, we examine whether the level of subsidiary investment is positively associated with $PE_{c,j,t}$, our measure for local growth opportunities. If PE-ratios capture local growth opportunities, we should observe a positive relation between investment and $PE_{c,j,t}$. To obtain a coefficient estimate for the average effect of $PE_{c,j,t}$ in our sample, we include country-industry fixed effects but do not interact these fixed effects with $PE_{c,j,t}$. As expected, the coefficient on $PE_{c,j,t}$ in Column 1 of Table 3 is positive and significant, consistent with $PE_{c,j,t}$ being a valid proxy for local growth opportunities.

We next estimate Equation (1) to test our baseline hypothesis. In Column 2 (3) of Table 3, we use our binary (continuous) measure for repatriation taxes. The coefficient on $RepatTax_{c,g,t}$ is insignificant in both columns, indicating that subsidiaries whose earnings are subject to repatriation taxes, on average, do not exhibit a different *level* of investment. Our coefficient of interest ($RepatTax_{c,g,t} * PE_{c,j,t}$), in contrast, is negative and significant for both measures. Supporting our baseline hypothesis, these results suggest that the investment behavior of subsidiaries whose earnings are subject to repatriation taxes is less sensitive to local growth opportunities (i.e. less efficient), relative to subsidiaries in the same country-industry whose earnings do not face repatriation taxes.

The results for control variables are generally consistent with our expectations. That is, the level of investment increases in the subsidiary's profitability, size, and stock of fixed assets while it decreases in the amount of credited provided by the banking sector. The coefficients on the interactions of the variables in the vector *Internal* with $PE_{c,j,t}$ are insignificant. Thus, internal

mechanisms adopted by the central management do not affect investment efficiency incremental to the effect captured by country-industry fixed effects.

In economic terms, the coefficient on $RepatTax_{c,g,t} * PE_{c,j,t}$ in Column 3 suggests that for the average subsidiary whose earnings are subject to these taxes, a one standard deviation change in local growth opportunities is associated with a 0.12 percentage point smaller change in investment compared to a subsidiary in the same country-industry whose earnings are not subject to repatriation taxes.²³ When evaluated at the sample mean investment of 0.45 percent, this effect is equal to a 27.1 percent ($= 0.12/0.45$) lower sensitivity of investment to local growth opportunities. Overall, these results support our baseline hypothesis that investment efficiency is decreasing in repatriation taxes.

INSERT TABLE 3 HERE

V. SUBSAMPLE RESULTS: INTERNAL AGENCY CONFLICTS AND HETEROGENEITY

Testing for Internal Agency Conflicts

We next examine whether internal agency conflicts drive this relation by testing whether our results are concentrated in subsidiaries susceptible to these conflicts. First, we split our sample based on the degree of information asymmetry between the central management and the subsidiary manager. Second, we split our sample based on the level of monitoring by central management.

²³ We calculate this effect using the mean of $RepatTax_{c,g,t}$ for subsidiaries whose earnings are subject to repatriation taxes (7.86 percent; see Panel C of Table 2) and the standard deviation of $PE_{c,j,t}$ for the full sample (7.81; see Panel A of Table 2): $-0.002 \times 7.86 \times 7.81 = -0.123$ percentage point smaller change in investment.

High Information Asymmetry

Informational frictions between the central management and the foreign subsidiary imply greater opportunities for a self-interested subsidiary manager to invest in pet projects. These frictions exacerbate central management's ability to verify local growth opportunities and to disentangle value-maximizing investment from investment in pet projects (Chetty and Saez 2010). In addition, in the presence of high information asymmetry, central management is less able to monitor the subsidiary manager and to incentivize value-maximizing investment behavior (e.g., Björkman et al. 2004; Mian 2006; Bell et al. 2012; Denk et al. 2012). We expect subsidiaries subject to high information asymmetry to be prone to internal agency conflicts and, therefore, the effect of repatriation taxes on investment efficiency to be concentrated in these subsidiaries.

To test this assertion empirically, we split our sample based on three different proxies that identify high information asymmetry. First, we divide our sample based on industry affiliation. If a subsidiary operates in an industry different from its parent's, central management has less information about the subsidiary's operations and its investment opportunities (Goodman, Neamtiu, Shroff, and White 2014). We use 1-digit NACE industry codes available in the Orbis database to define subsamples of subsidiaries operating in the same or in a different industry than their parents.

Second, we split the sample into subsidiaries that are owned directly by their parents and those that are owned indirectly. If a parent directly controls a foreign subsidiary (first-tier subsidiary), information transfers from the subsidiary to the central management should be smooth. In contrast, if a subsidiary has multiple tiers between itself and the parent, central management receives less reliable information about the subsidiary's investment opportunities (Mian 2006). Empirically, we exploit ownership information in the Orbis database and identify a

subsidiary as first tier if the parent holds a direct participation of more than 50 percent.

Third, we divide the sample based on the extent to which the subsidiary's management team comprises expatriate managers. Staffing foreign subsidiaries with expatriate managers diminishes cross-border frictions, such as language or cultural differences, which improves information transfers from the subsidiary to the central management (Gong 2003). To control for differences in staffing strategies between MNCs, we identify high information asymmetry if the number of a subsidiary's managers sent from the parent country is below the MNC-wide median. We obtain manager-level data from the Orbis database.²⁴

We present results in Table 4. In line with our predictions, coefficients on $RepatTax_{c,g,t} * PE_{c,j,t}$ are negative and significant for subsamples with high information asymmetry while they are insignificant if informational frictions are low. These results hold for identifying information asymmetry based on industry affiliation (Columns 1 and 2), ownership (Columns 3 and 4), and the share of expatriate managers (Columns 5 and 6). In addition to lower investment efficiency, the positive coefficient on $RepatTax_{c,g,t}$ in Column 4 provides some evidence for repatriation taxes leading to a higher *level* of investment. We interpret this as evidence that repatriation taxes incentivize subsidiary managers to retain unprofitable projects or to overinvest in projects with low or negative net present value. This investment behavior is consistent with inefficient *over*-investment.

INSERT TABLE 4 HERE

²⁴ Orbis provides manager-level information for the board of directors, senior managers, and executives. We use information available for 45,083 subsidiary-years in our sample to identify expatriate managers. We classify a manager as expatriate if the manager has the same nationality as the parent.

Weak Monitoring

Similar to informational frictions, weak monitoring by central management also aggravates internal agency conflicts. If monitoring is low, central management less strictly enforces value-maximizing investment behavior, increasing the opportunities of a self-interested subsidiary manager for inefficient investment (e.g., Bloom et al. 2012; Shroff et al. 2014). In this section, we examine two settings associated with high monitoring costs and, therefore, a low level of monitoring. If internal agency conflicts drive lower investment efficiency, the effect of repatriation taxes should be concentrated in subsidiaries that are weakly monitored by central management.

First, we explore partially-owned subsidiaries characterized by the presence of minority shareholders. Prior research suggests that minority shareholders free ride on the monitoring effort of the majority shareholder (the parent), which reduces central management's monitoring incentives (Ang, Cole, and Lin 2000). We classify a subsidiary as partially-owned if the total direct and indirect participation of the parent (*TotalParticipation_p*) is less than 100 percent.

Second, we examine the quality of institutions and corporate governance mechanisms of the subsidiary country as they shape monitoring costs (Asiedu and Esfahani 2001). If the subsidiary is located in a country with low-quality institutions and corporate governance mechanisms, central management faces high costs of assessing the subsidiary's investment behavior, leading to weak monitoring. We draw on the 2015 Control of Corruption Index from the World Bank's Worldwide Governance Indicators Project and construct a country-level measure. We classify subsidiary countries with an index score below the sample median as having low-quality institutions and

corporate governance mechanisms (i.e., high monitoring costs).²⁵

We present results in Table 5. As expected, the coefficients on $RepatTax_{c,g,t} * PE_{c,j,t}$ are negative and significant only in subsamples with weak monitoring (Columns 2 and 4) while they are insignificant for wholly-owned subsidiaries (Column 1) and for subsidiaries located in countries with high-quality institutions and corporate governance mechanisms (Column 3). In Column 4, the positive coefficient on $RepatTax_{c,g,t}$ again provides some indication for inefficient over-investment; weak monitoring by the central management amplifies the relation between repatriation taxes and investment efficiency. In other words, repatriation taxes imply a trade-off for central management between agency costs associated with inefficient investment and the costs of monitoring foreign subsidiary managers.

INSERT TABLE 5 HERE

Collectively, the subsample results for differences in information asymmetry and the degree of monitoring support an agency-based explanation: internal agency conflicts between the central management of an MNC and the manager of a foreign subsidiary are a distinct driver of the negative effect of repatriation taxes on subsidiary-level investment efficiency.

Heterogeneity in the Effect of Repatriation Taxes: Subsidiaries of Cash-rich MNCs

In this section, we further explore the effect of repatriation taxes. As outlined above, in the presence of these taxes, a self-interested subsidiary manager will invest capital either in value-maximizing projects or in pet projects. As one precondition for inefficient investment is that the

²⁵ For more information, please refer to: <http://info.worldbank.org/governance/wgi/index.aspx#home>. We lose observations, as the measure is not available for all countries in 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 UK. We crosscheck our results with a comparable measure compiled by Transparency International and find similar results.

subsidiary manager has cash available for self-interested investment (Chetty and Saez 2010), we expect repatriation taxes to primarily reduce the investment efficiency of subsidiaries of cash-rich MNCs.

We apply two strategies to identify such subsidiaries. First, we sort observations based on the subsidiary's cash ratio per subsidiary country-industry. As repatriation taxes may be associated with higher subsidiary-level cash holdings (Foley et al. 2007), we sort observations separately for subsidiaries whose earnings are subject to repatriation taxes and for those whose earnings are not subject to these taxes to avoid splitting the sample based on repatriation taxes. Within each group, we classify subsidiary-years with a cash ratio in the bottom quartile as belonging to an MNC with low cash. Second, we exploit an MNC's operating-cash-flow-to-total-assets ratio in year t . We sort observations per parent country-industry and classify MNC-years in the lowest quartile as having low internal capital. We again sort observations separately for parents subject to repatriation taxes and for those not subject to these taxes.²⁶ These MNCs lack internal capital (De Simone and Lester 2018) and are therefore unlikely to hold excess cash in their foreign subsidiaries.

We present results in Table 6. Consistent with our expectation, the coefficients on $RepatTax_{c,g,t} * PE_{c,j,t}$ are negative and significant only for subsidiaries of cash-rich MNCs (Columns 2 and 4). In contrast, these coefficients are insignificant for subsidiaries with low cash holdings (Column 1) and for subsidiaries of MNCs with scarce internal capital (Column 3). The positive coefficient on $RepatTax_{c,g,t}$ in Column 2 is again consistent with inefficient over-investment. Overall, these results suggest the extent of cash available for a subsidiary manager

²⁶ For example, we compare all U.S. MNCs in the oil industry. An MNC's internal capital, therefore, is measured relative to its peers within the same country (i.e., tax system) and the same industry.

facilitates the negative effect of repatriation taxes on investment efficiency.

INSERT TABLE 6 HERE

A potential concern regarding our subsample tests in Table 4 to Table 6 is that the variables used to define the subsamples could be positively correlated with $RepatTax_{c,g,t}$. To address this concern, we examine the distribution of $RepatTax_{c,g,t}$ in each subsample and find that repatriation taxes are similarly distributed across subsamples (untabulated). In fact, in four out of the seven sample splits, the mean of $RepatTax_{c,g,t}$ is significantly *lower* in the subsample in which regression results suggest lower investment efficiency. Thus, the distribution of repatriation taxes within subsamples is unlikely to drive our results.

VI. EXOGENOUS SHOCKS ON REPATRIATION TAXES: TAX REFORMS IN THE UK AND IN JAPAN

Institutional Setting and Research Design

In 2009, both the UK and Japan reformed their international tax systems and switched from worldwide to territorial taxation. The aim of the reform in the UK was to increase its attractiveness as a business location and to prevent MNCs from relocating abroad. Similarly, the Japanese reform was intended to encourage the repatriation of foreign earnings for domestic investment (Arena and Kutner 2015). After these reforms, repatriations of MNCs residing in the UK are fully exempt from repatriation taxes while Japan exempts 95 percent of repatriations. Other elements of the tax system, such as the corporate income tax rate, remained unchanged in both countries.²⁷

²⁷ In the UK, a corporate income rate of 28 percent was effective from April 1, 2008. This tax rate was reduced to 26 percent effective from April 1, 2011. The Japanese corporate income tax consists of a federal tax, supplemented by local taxes. These taxes implied an average corporate income tax rate of 41 percent, which was lowered to 37 percent effective from April 1, 2012.

We follow Arena and Kutner (2015) and Xing (2018) and treat these tax reforms as quasi-natural experiments to support a causal interpretation of our baseline findings. We expect the repeal of repatriation taxes to increase subsidiary-level investment efficiency due to removing a tax cost of paying a dividend to the parent. This reduces excess cash and limits the opportunities of a self-interested subsidiary manager to invest in pet projects (Chetty and Saez 2010). To test this, we use a difference-in-differences (DiD) research design with foreign subsidiaries of British and Japanese MNCs as the treatment group. We compare their investment behavior to a control group of foreign subsidiaries of U.S. MNCs whose earnings faced repatriation taxes throughout the entire sample period. In addition, the U.S. did not alter its 35 percent corporate income tax rate during our sample period. Thus, we can attribute changes in investment behavior to the repeal of repatriation taxes.

These quasi-natural experiments appear to provide the cleanest identification of the effects we are interested in. However, we present this analysis as supplementary rather than primary due to two limitations of the settings. First, both reforms took place during the financial crisis, which could affect subsidiary investment. Although we control for the uniform effect of the financial crisis on the treatment and the control group in the subsequent analysis, we are unable to capture differential effects as data limitations prevent us from excluding the crisis years and comparing investment behavior after the reform to pre-crisis years (e.g., 2005-2006). Second, the Japanese tax reform was widely discussed in the media, potentially resulting in anticipation effects (Xing 2018). In expectation of central management repatriating foreign cash holdings immediately after the reform, subsidiary managers of Japanese MNCs faced strong incentives to invest in pet projects in the year prior to the reform.

To test our prediction, we modify Equation (1) and estimate the following OLS regression

separately for British and Japanese subsidiaries:

$$\begin{aligned}
Investment_{i,t} = & \alpha_c + \alpha_j + \alpha_p + \sum \beta_{c,j} \alpha_{c,j} * PE_{c,j,t} + \beta_1 PE_{c,j,t} + \beta_2 Reform_c + \\
& \beta_3 Post_t + \beta_4 Reform_c * Post_t + \beta_5 Reform_c * PE_{c,j,t} + \\
& \beta_6 Post_t * PE_{c,j,t} + \beta_7 Reform_c * Post_t * PE_{c,j,t} + \\
& \sum \beta_k SubsidiaryControls_{i,t}^k + \sum \beta_m ParentControls_{p,t}^m + \\
& \sum \beta_n Internal^n * PE_{c,j,t} + \varepsilon_{i,t}
\end{aligned} \tag{2}$$

We include indicator variables to identify the treatment group ($Reform_c$) and the period after the tax reforms ($Post_t$). $Reform_c$ is equal to 1 if the subsidiary is owned by an MNC residing in the UK or Japan, respectively, and 0 for subsidiaries of U.S. MNCs. $Post_t$ is equal to 1 for post-reform years. As both reforms became effective in 2009, $Post_t$ is equal to 1 for years after 2008. The interaction term $Reform_c * Post_t$ denotes the change in the level of investment from the pre to the post period of UK and Japanese subsidiaries, respectively, relative to U.S. subsidiaries. We expect that treatment subsidiaries invest less after the reform (Arena and Kutner 2015), suggesting a negative coefficient on $Reform_c * Post_t$. Our coefficient of interest is the treatment effect conditional on local growth opportunities. We interact $Reform_c * Post_t$ with $PE_{c,j,t}$ and expect a positive coefficient. This result would indicate that, after the reform, investment of British and Japanese subsidiaries is more sensitive to local growth opportunities, consistent with investment efficiency increasing after the repeal of repatriation taxes.

Consistent with Equation (1), we include subsidiary country and subsidiary industry fixed effects as well as the interactions of subsidiary country-industry fixed effects with $PE_{c,j,t}$.²⁸ In the

²⁸ We do not include year fixed effects in the DiD estimation because they are collinear with $Post_t$.

DiD specification, we therefore identify the effect of the tax reforms by comparing the investment efficiency of treatment subsidiaries (i.e., subsidiaries of British/Japanese MNCs) to the investment efficiency of control subsidiaries (i.e., subsidiaries of U.S. MNCs) in the same country-industry. This again mitigates concerns that unobserved factors at the subsidiary country-industry level drive our results.

Regression Results

In Table 7, we show results for the DiD analysis of British (Columns 1 and 2) and Japanese subsidiaries (Columns 3 and 4), respectively. In these tests, we limit the pre (post) period to the year 2008 (2009). The coefficients on $Reform_c * Post_t$ are negative and significant in Columns 1 and 3. These results are consistent with Arena and Kutner (2015) and suggest that British and Japanese subsidiaries reduced the *level* of investment in response to the reform. Corroborating our baseline findings, the coefficients on $Reform_c * Post_t * PE_{c,j,t}$ are positive and significant. This suggests that investment *efficiency* of British and Japanese subsidiaries relative to U.S. subsidiaries increased after reform removed repatriation taxes. Collectively, the repeal of repatriation taxes reduced the level of investment while increasing the investment efficiency of subsidiaries affected. Such a response is consistent with a reduction in inefficient overinvestment at the subsidiary-level.

In Columns 2 and 4, we assess whether the parallel trend assumption holds in our settings; that is, we test whether subsidiaries in the treatment and control groups exhibit similar trends in investment efficiency prior to the reform. Therefore, we define a placebo treatment for the year 2008, classifying 2007 as the pre period and 2008 as the post period. If the parallel trend assumption holds, coefficients on $Reform_c * Post_t * PE_{c,j,t}$ should be insignificant.

In Column 2, we find insignificant coefficients on $Reform_c * Post_t$ and on $Reform_c *$

$Post_t * PE_{c,j,t}$, providing support for parallel pre-reform trends in the level of investment and in investment efficiency of British and U.S. subsidiaries. For Japanese subsidiaries, however, the coefficient on $Reform_c * Post_t * PE_{c,j,t}$ ($Reform_c * Post_t$) is negative (positive) and significant in Column 4, indicating that pre-reform trends in the level of investment and in investment efficiency of Japanese subsidiaries differ from those of U.S. subsidiaries. Relative to U.S. subsidiaries, Japanese subsidiaries increased the level of investment but decreased investment efficiency from 2007 to 2008. In other words, managers of Japanese subsidiaries invested more inefficiently in the year before repatriation taxes were repealed, consistent with anticipation effects due to public discussions prior to the reform (Xing 2018).²⁹

INSERT TABLE 7 HERE

We conduct additional tests to validate our results from the DiD analysis. First, we extend the pre and the post period to include two years each and obtain similar results. Second, we conduct further placebo tests in which we assign the tax reforms to random years other than 2009. Third, we run our tests on a sample of foreign subsidiaries of MNCs located in countries without a tax reform, such as Germany or France, and compare their investment behavior to U.S. subsidiaries. In all tests (untabulated), coefficients on $Reform_c * Post_t * PE_{c,j,t}$ are insignificant, suggesting that it is unlikely that we capture a random, non-tax reform effect in our tests.

Taken together, these results indicate that the repeal of repatriation taxes, while leading to a lower level of investment, resulted in an increase in investment efficiency. We therefore conclude that repatriation taxes have a likely causal effect on subsidiary-level investment efficiency.

²⁹ Such anticipation effects are unlikely among British subsidiaries because the tax reform in the UK was proposed and ultimately enacted during December 2008 (Arena and Kutner 2015).

VII. SUPPLEMENTARY ANALYSIS AND ROBUSTNESS TESTS

Repatriation Taxes and Subsidiary-level Cash Holdings

While our subsample results suggest that repatriation taxes reduce the investment efficiency of subsidiaries of cash-rich MNCs, these tests do not provide empirical support for the argument that repatriation taxes lead to higher cash holdings. Prior research has shown that *aggregate* foreign cash holdings are associated with repatriation taxes (Foley et al. 2007), but it has not been shown that the effect manifests at the subsidiary level. To examine this, we plot the mean subsidiary cash ratio per year ($CashRatio_{i,t}$) conditional on whether the subsidiary's earnings are subject to repatriation taxes. Figure 2 suggests that subsidiaries whose earnings are subject to repatriation taxes hold a significantly higher amount of cash. The difference in cash holdings ranges from 1.5 to 4 percent of total assets and is statistically significant in all sample years (all $p < 0.01$).

INSERT FIGURE 2 HERE

To supplement this graphical evidence, we estimate a slightly adapted version of Equation (1) with $CashRatio_{i,t}$ as a dependent variable and report results in Table 8. In Column 1, we find that the average subsidiary whose earnings are subject to repatriation taxes has a 0.65 percentage point higher cash ratio than a subsidiary whose earnings are not subject to such taxes.³⁰ For a mean cash ratio of 13.92 percent (Panel A of Table 2), this effect is equal to 4.69 percent higher cash holdings ($= 0.65/13.92$). In Column 2, we include subsidiary country-industry-year fixed effects and find consistent results.³¹ Overall, these findings suggest that repatriation taxes are associated

³⁰ We calculate this effect using the mean of $RepatTax_{c,g,t}$ for subsidiaries whose earnings are subject to repatriation taxes (7.86 percent; see Panel C of Table 2): $0.083 \times 7.86 = 0.65$ percentage point higher cash ratio.

³¹ In Equation (1), we interact country-industry fixed effects instead of country-industry-year fixed effects with $PE_{c,j,t}$ because $PE_{c,j,t}$ is measured at the country-industry-year level. In this test, we are able to include country-industry-year fixed effects because

with higher subsidiary-level cash holdings, supporting the assertion that managers of subsidiaries subject to repatriation taxes have access to excess cash.

INSERT TABLE 8 HERE

Additional Robustness Tests

We conduct a battery of additional tests to assess the robustness of our findings and present results in Table 9. First, we test whether the effect of repatriation taxes on investment efficiency is incremental to the effect on foreign M&A activity as documented in Hanlon et al.(2015) and Harford et al. (2017). To test this, we include an indicator variable ($M\&A_{i,t}$) with the value of one if the subsidiary or its parent engaged in M&A activity in the subsidiary country in the current or in the previous year.³² In Column 1, we continue to find a negative and significant coefficient on $RepatTax_{c,g,t} * PE_{c,j,t}$. Alternatively, we drop subsidiary-years with M&A activity in Column 2 and find results consistent with our baseline findings. These results support our argument that the effect of repatriation taxes on subsidiary-level investment is incremental to M&A activity.

In Column 3, we include the subsidiary cash ratio ($CashRatio_{i,t}$) to additionally control for a subsidiary's internal funds available for investment. As noted, because subsidiaries that face repatriation taxes also report higher cash holdings, this variable could, as a mediator or collider control, bias the results (Gow et al. 2016). However, including $CashRatio_{i,t}$ leaves our results unchanged.

In Column 4, we add subsidiary fixed effects to capture unobserved time-invariant subsidiary

$RepatTax_{c,t}$ is a subsidiary-level measure that varies within each country-industry-year. However, we are unable to estimate a coefficient on $DomesticCredit_{c,t}$, which is a country-year-level measure.

³² We obtain M&A data from Bureau van Dijk's Zephyr database.

characteristics.³³ This test requires *within*-subsidiary variation in repatriation taxes. As discussed, such variation stems from changes in the tax system of the parent country (e.g., in the UK and Japan) and from changes in corporate income tax rates in the parent or the subsidiary country. When including these fixed effects, the coefficient on $RepatTax_{c,g,t} * PE_{c,j,t}$ remains negative and significant, providing comfort that omitted subsidiary characteristics do not drive our results. Alternatively, we include MNC fixed effects to capture time-invariant MNC characteristics. By including these fixed effects, we also control for any subsidiary-level investment effects of first-tier agency conflicts between an MNC's central management and its shareholders (Hanlon et al. 2015). The results in Column 5 are again consistent with our baseline findings.

Finally, we limit observations subject to repatriation taxes to foreign subsidiaries of U.S. MNCs. In Column 6, the coefficient on $RepatTax_{c,g,t} * PE_{c,j,t}$ remains negative and significant, consistent with our baseline results.

INSERT TABLE 9 HERE

VIII. CONCLUSION

Using a global sample of MNCs and their foreign subsidiaries, we show that repatriation taxes impair the efficiency of investment decisions made by the manager of a foreign subsidiary. The effect of repatriation taxes is prevalent in i) subsidiaries subject to high information asymmetry between the central management and the subsidiary manager, ii) subsidiaries subject to weak monitoring, and iii) subsidiaries of cash-rich MNCs. These results are consistent with internal agency conflicts driving the effect of repatriation taxes on investment efficiency.

³³ We do not include subsidiary country and industry fixed effects because they are absorbed by the subsidiary fixed effects.

We also provide support for a causal interpretation of our findings by examining tax reforms in the UK and Japan as both countries repealed repatriation taxes on foreign earnings in 2009. Using these quasi-natural experiments in a DiD research design, we find that the investment *efficiency* of foreign subsidiaries increased while the *level* of investment decreased after repatriation taxes were eliminated, consistent with a reduction in inefficient over-investment.

Our study provides timely empirical evidence on subsidiary-level investment consequences of repatriation taxes. The U.S. recently enacted legislation that eliminates repatriation taxes on most of the future foreign earnings of U.S. MNCs. Our results suggest that this reform could lead to efficiency gains for U.S. MNCs and their shareholders. The subsidiary country, in contrast, could bear negative economic consequences in the form of lower investment. These results should be of interest to policymakers in the U.S. and in the countries in which U.S. MNCs operate.

APPENDIX A: VARIABLE DEFINITIONS

Variable	Definition
<i>CashRatio</i>	Cash and cash equivalents of subsidiary <i>i</i> in year <i>t</i> scaled by total assets of subsidiary <i>i</i> in year <i>t</i> .
<i>CashFlowParent</i>	Operating cash flow of parent <i>p</i> in year <i>t</i> scaled by total assets of parent <i>p</i> in year <i>t</i> .
<i>DomesticCredit</i>	Amount of credit provided by the banking sector of country <i>c</i> scaled by the Gross Domestic Product (GDP) of country <i>c</i> in year <i>t</i> .
<i>Investment</i>	Fixed assets of subsidiary <i>i</i> in year <i>t</i> less fixed assets of subsidiary <i>i</i> in year <i>t-1</i> scaled by total assets of subsidiary <i>i</i> in year <i>t-1</i> .
<i>M&A</i>	Indicator variable with the value of one if parent <i>p</i> or subsidiary <i>i</i> engage in M&A activity in subsidiary country <i>c</i> in year <i>t</i> or year <i>t-1</i> , and zero if parent <i>p</i> and subsidiary <i>i</i> do not engage in M&A activity in subsidiary country <i>c</i> in year <i>t</i> or year <i>t-1</i> . We obtain M&A data from Bureau van Dijk's Zephyr database.
<i>PE</i>	Price-to-earnings ratio for industry <i>j</i> in country <i>c</i> in year <i>t</i> . Industry <i>j</i> is defined based on one-digit ICB industries. We compute the PE-ratio for year <i>t</i> by using the median of monthly PE-ratios collected for year <i>t</i> . We obtain monthly PE-ratios from Datastream.
<i>RepatTax</i> (continuous)	Continuous measure for <i>RepatTax</i> calculated as the statutory corporate income tax rate in country <i>g</i> less the statutory corporate income tax rate in country <i>c</i> . We set <i>RepatTax</i> equal to zero if parent <i>p</i> resides in country <i>g</i> with a territorial tax system. In addition, we set <i>RepatTax</i> equal to zero if parent <i>p</i> resides in a country with a worldwide tax system but the statutory corporate income tax rate in country <i>g</i> is lower than the statutory corporate income tax rate in country <i>c</i> . We calculate <i>RepatTax</i> for year <i>t</i> .
<i>RepatTax</i> (indicator)	Indicator variable with the value of one if parent <i>p</i> resides in country <i>g</i> with (1) a worldwide tax system and (2) a higher corporate income tax rate than country <i>c</i> . <i>RepatTax</i> takes on the value of zero if parent <i>p</i> resides in country <i>g</i> with (1) a territorial tax system or (2) a lower corporate income tax rate than country <i>c</i> . We calculate <i>RepatTax</i> for year <i>t</i> .

<i>RoA</i>	Profit after tax of subsidiary <i>I</i> in year <i>t</i> scaled by total assets of subsidiary <i>i</i> in year <i>t</i> .
<i>Size</i>	Natural logarithm of total assets of subsidiary <i>i</i> in year <i>t</i> .
<i>Tangibility</i>	Fixed assets of subsidiary <i>i</i> in year <i>t</i> scaled by total assets of subsidiary <i>i</i> in year <i>t</i> .
<i>TotalParticipation</i>	Total direct and indirect participation of parent <i>p</i> in subsidiary <i>i</i> .

Additional Variables for the Difference-in-Differences Analysis

<i>Reform</i>	Indicator variable with the value of one if parent <i>p</i> resides in UK or Japan, respectively. <i>Reform</i> takes on the value of zero if parent <i>p</i> resides in the U.S.
<i>Post</i>	Indicator variable with the value of one if year <i>t</i> is equal to the year 2009. <i>Post</i> takes on the value of zero if year <i>t</i> is equal to the year 2008.

APPENDIX B: SAMPLE SELECTION

Sample Selection	Observations (subsidiary-years)
Data obtained from Bureau van Dijk's Orbis database after dropping subsidiaries without or limited financial statement information, subsidiaries exclusively filing consolidated financial statements, domestic subsidiaries, and subsidiaries without NACE and merged ICB codes	561,996
After dropping subsidiaries where the parent holds a total participation ≤ 50 percent	434,628
After dropping subsidiaries in the financial sector (NACE 6400-6899), the utility sector (NACE 3500-3999), and financial holdings (NACE 7010)	390,744
After dropping financial years < 2006 and > 2014 due to data for these years being unavailable or being not comprehensive	293,058
After dropping observations with missing or negative values for total assets, operating revenue, fixed assets, or cash and cash equivalents	136,870
After dropping observations with total assets, operating revenue, and fixed assets $< \text{US\$}10,000$	117,975
After dropping observations for countries with missing tax data	116,077
After dropping observations with missing values for <i>Investment</i> , <i>PE</i> , <i>RoA</i> , or <i>CashFlowParent</i>	57,475
After dropping observations with values for <i>Investment</i> , <i>PE</i> , <i>RoA</i> , <i>Size</i> , <i>Tangibility</i> , or <i>CashFlowParent</i> that are in the bottom and top 1.5 percent of the variable distribution	48,470
Final sample	48,470

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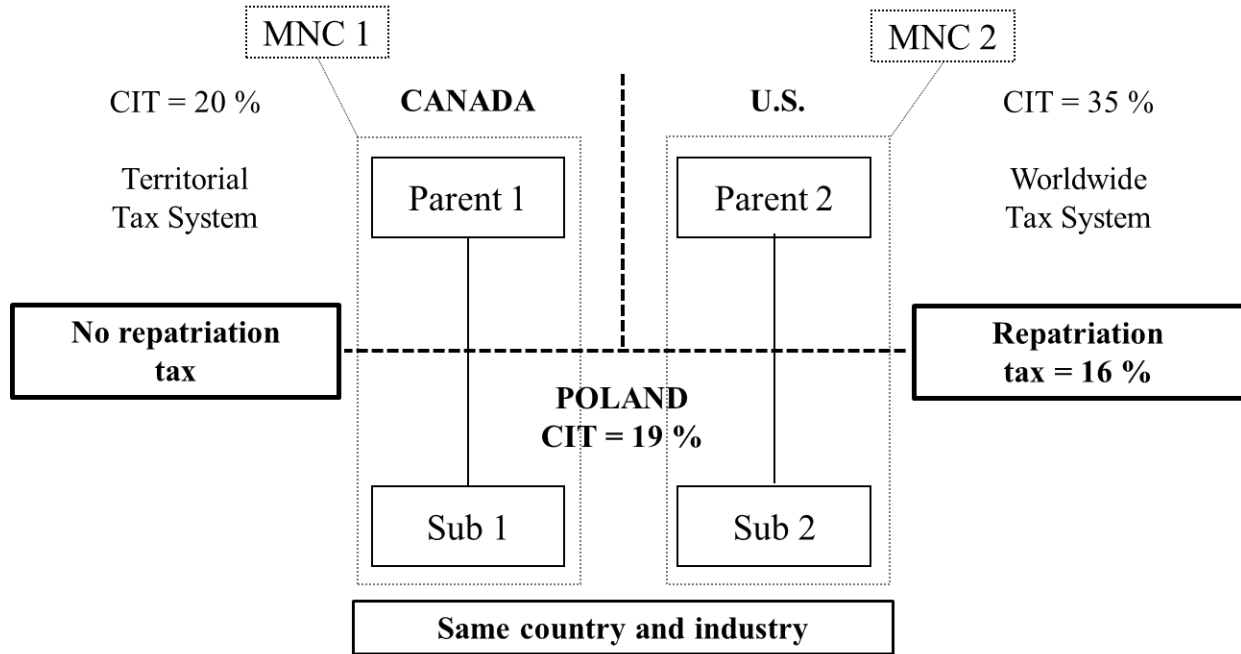
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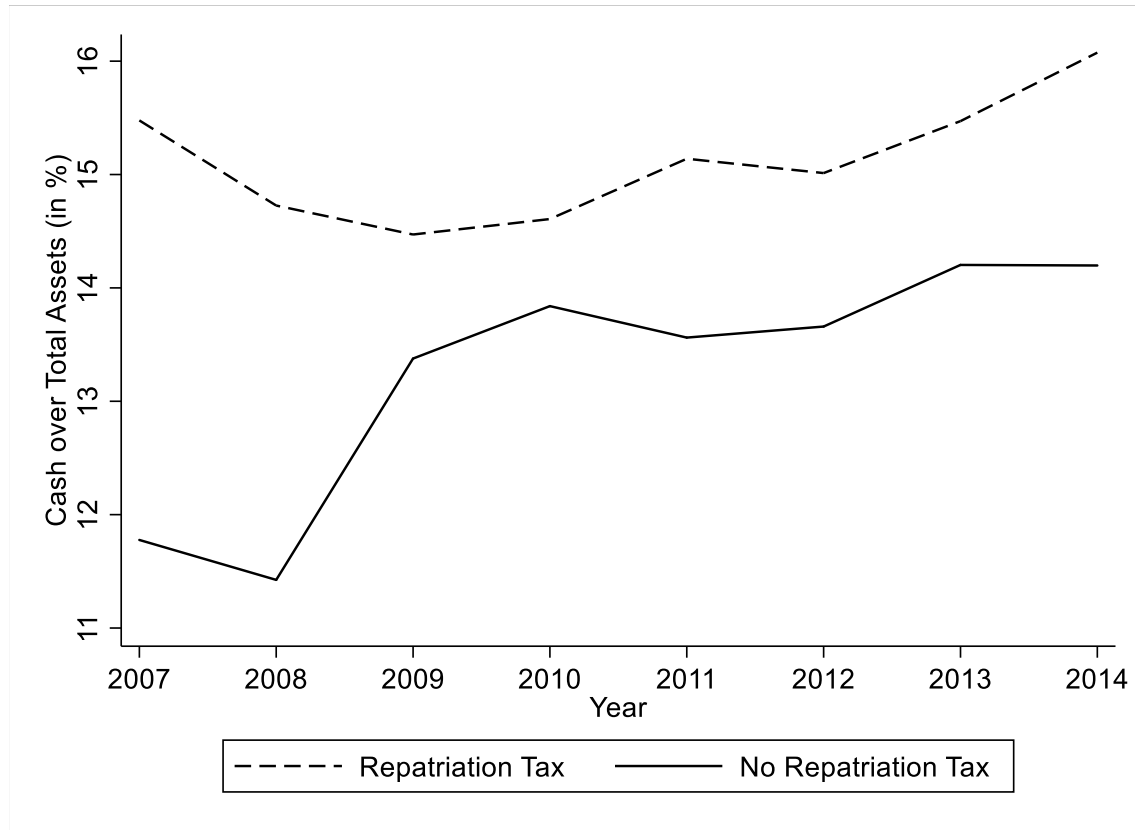
FIGURES AND TABLES

Figure 1: Empirical Approach



Note: This figure illustrates our empirical approach. Assume we have two MNCs (MNC 1 and MNC 2) that own foreign subsidiaries located in Poland and operating in the same industry. The earnings of the subsidiary with the Canadian parent (Sub 1) are not subject to repatriation taxes because Canada applies a territorial tax system. Sub 2 has a U.S. parent and, under the pre-2018 law, the subsidiary's earnings were subject to a repatriation tax of 16 percent (U.S. corporate income tax of 35 percent less a tax credit for the Polish corporate income tax of 19 percent) since the U.S. applied a worldwide tax system. By including interactions of subsidiary country-industry fixed effects and growth opportunities (i.e., *Country-Industry Indicators*PE*) in our regression model, we empirically compare whether the sensitivity of investment to local growth opportunities (investment efficiency) of these two Polish subsidiaries varies conditional on repatriation taxes. Thus, we identify the effect of repatriation taxes on investment efficiency from cross-subsidiary and cross-time variation in repatriation taxes within the same country-industry.

Figure 2: Repatriation Taxes and Subsidiary-level Cash Holdings



Note: This figure presents the mean *CashRatio* for the years 2007-2014. We split the sample based on whether a subsidiary's earnings are subject to repatriation taxes. Untabulated t-tests suggest that *CashRatio* significantly differs between subsamples in each sample year ($p < 0.01$).

Table 1: Distribution of Parent-Year and Subsidiary-Year Observations by Country

Parent-Years		Subsidiary-Years		Parent-Years		Subsidiary-Years			
Country	N	%	N	%	Country	N	%	N	%
Australia	209	0.4	572	1.2	Luxembourg	739	1.5	27	0.1
Austria	406	0.8	650	1.3	Macedonia	13	0.0	0	0.0
Barbados	6	0.0	0	0.0	Malaysia	39	0.1	0	0.0
Belgium	614	1.3	2,559	5.3	Malta	10	0.0	15	0.0
Bermuda	99	0.2	0	0.0	Mauritius	16	0.0	0	0.0
Brazil	30	0.1	12	0.0	Morocco	3	0.0	5	0.0
BVI	13	0.0	0	0.0	Netherlands	1,302	2.7	903	1.9
Bulgaria	0	0.0	372	0.8	New Zealand	48	0.1	0	0.0
Canada	455	0.9	0	0.0	Norway	727	1.5	1,346	2.8
Chile	2	0.0	0	0.0	Pakistan	4	0.0	0	0.0
China	145	0.3	900	1.9	Peru	5	0.0	0	0.0
Colombia	0	0.0	570	1.2	Philippines	0	0.0	378	0.8
Croatia	55	0.1	361	0.7	Poland	110	0.2	2,878	5.9
Cyprus	13	0.0	4	0.0	Portugal	62	0.1	1,047	2.2
Czech Republic	0	0.0	1,328	2.7	Qatar	3	0.0	0	0.0
Denmark	386	0.8	203	0.4	Romania	0	0.0	834	1.7
Finland	1,060	2.2	1,077	2.2	Russia	5	0.0	685	1.4
France	3,452	7.1	6,411	13.2	Serbia	8	0.0	0	0.0
Germany	5,235	10.8	4,464	9.2	Singapore	86	0.2	683	1.4
Gibraltar	8	0.0	0	0.0	Slovenia	19	0.0	361	0.7
Greece	71	0.1	572	1.2	South Africa	119	0.2	0	0.0
Hong Kong	25	0.1	0	0.0	Spain	1,119	2.3	3,548	7.3
Hungary	82	0.2	892	1.8	Sweden	3,122	6.4	1,932	4.0
Iceland	41	0.1	0	0.0	Switzerland	2,630	5.4	0	0.0
India	424	0.9	351	0.7	Taiwan	456	0.9	17	0.0
Ireland	675	1.4	358	0.7	Thailand	17	0.0	0	0.0
Israel	145	0.3	0	0.0	Turkey	13	0.0	146	0.3
Italy	1,304	2.7	3,637	7.5	UK	3,031	6.3	7,277	15.0
Japan	9,373	19.3	0	0.0	U.S.	9,971	20.6	0	0.0
Korea	428	0.9	1,095	2.3	UEA	34	0.1	0	0.0
Liechtenstein	3	0.0	0	0.0	Total	48,470	100	48,470	100

Note: This table presents the number of parent-year and subsidiary-year observations by country. In addition to the number of observations, we also indicate the fraction of the total sample.

Table 2: Descriptive Statistics

<i>Variables</i>	N	Mean	SD	Q1	Median	Q3
Panel A: Full Sample						
<i>Investment (in %)</i>	48,470	0.45	8.15	-2.36	-0.29	1.52
<i>PE</i>	48,470	17.77	7.81	12.85	16.25	20.35
<i>RepatTax (continuous in %)</i>	48,470	2.05	4.46	0.00	0.00	1.01
<i>RepatTax (indicator)</i>	48,470	0.26	0.44	0.00	0.00	1.00
<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>DomesticCredit (in %)</i>	48,470	105.90	43.66	79.40	96.11	138.36
<i>TotalParticipation (in %)</i>	48,470	95.12	12.31	99.98	100.00	100.00
<i>CashFlowParent (in %)</i>	48,470	8.50	5.19	5.30	7.96	11.4
<i>CashRatio (in %)</i>	48,470	13.92	17.21	1.48	7.05	20.01
Panel B: Subsample No Repatriation Tax						
<i>Investment (in %)</i>	35,807	0.45	8.22	-2.42	-0.30	1.58
<i>PE</i>	35,807	17.87	7.89	12.95	16.35	20.35
<i>RepatTax (continuous in %)</i>	35,807	0.00	0.00	0.00	0.00	0.00
<i>RepatTax (indicator)</i>	35,807	0.00	0.00	0.00	0.00	0.00
<i>RoA (in %)</i>	35,807	4.84	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>DomesticCredit (in %)</i>	35,807	102.73	42.07	69.33	94.94	131.21
<i>TotalParticipation (in %)</i>	35,807	95.10	12.16	99.95	100.00	100.00
<i>CashFlowParent (in %)</i>	35,807	8.18	5.00	5.15	7.65	11.11
<i>CashRatio (in %)</i>	35,807	13.50	16.70	1.48	6.90	19.36
Panel C: Subsample Repatriation Tax						
<i>Investment (in %)</i>	12,663	0.44	7.95	-2.18	-0.25	1.39
<i>PE</i>	12,663	17.48	7.56	12.70	16.05	19.95
<i>RepatTax (continuous in %)</i>	12,663	7.86	5.54	3.60	7.00	10.69
<i>RepatTax (indicator)</i>	12,663	1.00	0.00	1.00	1.00	1.00
<i>RoA (in %)</i>	12,663	6.42***	12.50	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>DomesticCredit (in %)</i>	12,663	114.87***	46.72	84.54	98.19	156.86
<i>TotalParticipation (in %)</i>	12,663	95.16	12.72	99.99	100.00	100.00
<i>CashFlowParent (in %)</i>	12,663	9.42***	5.57	5.86	8.94	12.64
<i>CashRatio (in %)</i>	12,663	15.12***	18.53	1.48	7.42	22.41
Panel D: Data on Holding Structures						
<i>Unique Subsidiaries</i>	10,629					
<i>Unique Parents</i>	2,714					
<i>Subsidiary-Years per Parent</i>		17.86	32.07	3.00	8.00	18.00
<i>Subsidiaries per Parent</i>		3.92	6.29	1.00	2.00	4.00

Panel E: Repatriation Taxes by Subsidiary Country-Industry

<i>One-digit ICB Industry</i>	<i>Oil and Gas</i>			<i>Basic Materials</i>			<i>Industrials</i>			<i>Consumer Goods</i>			<i>Health Care</i>			<i>Consumer Services</i>			<i>Telecom- munications</i>			<i>Technology</i>			
<i>Country</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Total</i>
<i>Australia</i>	3.3	2.9	3	1.8	2.7	41	1.2	2.3	274	1.4	2.8	51	3.3	2.5	9	1.3	2.6	170	5.0	0.0	10	1.5	3.2	14	572
<i>Austria</i>				0.0	0.0	39	1.5	3.9	276	2.3	4.4	67				2.5	4.5	267	0.0	0.0	1				650
<i>Belgium</i>				0.6	1.6	132	0.4	1.2	1,279	0.8	1.7	138	0.3	1.1	166	0.4	1.3	587	0.0	0.0	29	0.3	0.9	228	2,559
<i>Brazil</i>				1.0	0.0	1	0.0	0.0	6	0.3	0.6	3				0.0	0.0	1				1.0	0.0	1	12
<i>Bulgaria</i>				0.0	0.0	11	4.3	8.6	239	3.7	8.1	73				5.6	10.5	49							372
<i>China</i>	10.0	0.0	3	2.1	4.1	100	1.8	3.9	369	1.5	3.6	156	1.3	3.5	8	0.5	2.2	62				0.7	2.5	202	900
<i>Colombia</i>	4.7	4.1	6	1.2	2.3	47	1.6	3.0	215	2.2	3.3	107				2.0	3.4	171	0.9	2.8	24				570
<i>Croatia</i>							0.8	3.6	207	1.8	3.9	22				4.7	7.2	119	0.0	0.0	13				361
<i>Cyprus</i>				0.0	0.0	2	0.0	0.0	1							0.0	0.0	1							4
<i>Czech Republic</i>							2.4	5.6	925	2.6	6.1	282				3.1	6.4	113	0.0	0.0	8				1,328
<i>Denmark</i>							1.1	3.1	77	0.0	0.0	22	0.0	0.0	5	1.7	3.9	67	4.7	5.3	13	3.2	4.9	19	203
<i>Finland</i>				1.7	3.7	50	1.9	4.1	606	0.0	0.0	36	6.2	5.7	24	1.9	4.2	282				3.4	5.2	79	1,077
<i>France</i>				0.6	1.3	372	0.5	1.3	3,404	0.7	1.6	471	0.6	1.1	131	0.7	1.6	1,604	0.4	0.7	31	0.7	1.1	398	6,411
<i>Germany</i>	0.0	0.0	1	0.9	2.4	355	1.5	2.9	2,193	2.2	2.9	260	0.6	1.9	178	1.6	3.0	981	1.7	2.6	16	1.9	2.9	480	4,464
<i>Greece</i>				1.0	4.0	30	2.8	5.1	258	0.5	1.5	20	0.0	0.0	3	1.8	4.1	227	0.0	0.0	17	2.3	4.3	17	572
<i>Hungary</i>							3.8	7.0	446	3.8	7.6	150	16.0	0.0	5	5.8	8.4	100	1.8	5.2	26	4.2	7.2	165	892
<i>India</i>	0.0	0.0	3	0.1	0.6	24	0.1	0.4	135	0.2	0.6	98	0.8	1.0	22	0.5	0.8	26	0.3	0.6	3	0.7	0.9	40	351
<i>Ireland</i>				0.0	0.0	5	9.4	10.8	184	6.2	11.1	20	11.3	13.0	4	10.8	11.0	109	0.0	0.0	1	14.0	11.0	35	358
<i>Italy</i>	0.0	0.0	16	1.0	1.8	206	0.8	1.8	1,702	1.2	2.3	316	0.5	1.2	222	1.2	2.0	820				0.7	1.5	355	3,637
<i>Korea</i>				1.5	4.2	77	2.7	5.0	535	3.2	5.2	104	9.2	1.9	4	2.4	4.8	257	1.9	5.0	7	3.4	5.3	111	1,095
<i>Luxembourg</i>										5.8	0.5	7				2.7	3.1	20							27
<i>Malta</i>	0.0	0.0	2				0.0	0.0	12							0.0	0.0	1							15
<i>Morocco</i>							0.0	0.0	1	1.7	2.9	3										0.0	0.0	1	5
<i>Netherlands</i>	4.9	5.3	8	5.2	5.6	35	3.0	5.0	465	4.3	5.1	86	9.8	0.3	8	3.7	5.2	244	0.0	0.0	8	1.6	4.0	49	903
<i>Norway</i>	0.8	2.3	58	3.1	3.6	23	1.0	2.7	769	2.6	3.6	14				1.0	2.6	279	0.0	0.0	8	1.4	2.8	195	1,346
<i>Philippines</i>				0.4	1.4	49	1.7	2.5	168	1.3	2.3	61				1.2	2.2	94	0.8	2.0	6				378
<i>Poland</i>	16.0	0.0	2	3.2	6.2	147	2.4	5.7	1,503	3.0	6.3	405				3.8	6.9	597	2.4	5.7	29	2.0	5.2	195	2,878
<i>Portugal</i>				0.5	2.7	66	1.7	4.2	422	0.8	3.3	107	2.4	5.4	5	2.8	4.7	354	0.0	0.0	7	3.4	5.0	86	1,047
<i>Romania</i>	0.0	0.0	3	2.5	5.8	61	3.1	6.8	475	3.0	7.1	147	0.0	0.0	11	6.4	9.2	137							834
<i>Russia</i>	0.0	0.0	3	1.9	4.6	158	1.0	4.0	322	1.2	3.1	29				4.3	7.1	154	2.0	3.5	19				685

<i>Singapore</i>	11.2	12.5	12	2.7	8.0	9	7.7	12.2	426	8.0	12.2	26	14.0	13.3	24	5.9	11.7	104	5.0	11.2	5	8.6	11.2	77	683
<i>Slovenia</i>				0.0	0.0	13	1.3	4.4	185	3.9	6.8	42	1.6	5.4	12	1.4	3.9	85	0.0	0.0	1	3.5	6.8	23	361
<i>Spain</i>				1.4	2.6	232	1.2	2.4	1,680	1.0	2.3	288	0.8	1.7	54	1.7	2.6	992	0.6	1.7	39	1.2	2.3	263	3,548
<i>Sweden</i>				1.7	3.9	123	2.5	4.3	887	1.4	3.5	155	3.0	4.6	25	2.4	4.3	576	0.5	2.2	37	3.3	4.7	129	1,932
<i>Taiwan</i>	15.7	0.0	1	0.0	0.0	2	3.5	6.9	9							15.7	0.0	1				0.0	0.0	4	17
<i>Turkey</i>				0.4	1.3	11	0.7	3.3	76	10.8	6.2	21	0.0	0.0	4	1.8	4.9	34							146
<i>UK</i>	2.5	4.0	137	4.3	4.3	322	3.4	4.4	3,586	2.4	4.1	517	3.9	4.5	226	3.5	4.4	1,465	3.3	4.6	121	4.4	4.4	903	7,277
Total			258			2,743			24,317			4,304			1,150			11,150			479			4,069	48,470

Note: This table presents descriptive statistics for the subsidiaries in our sample. Panel A presents information for the full sample. Panel B (C) displays information for the subsample of subsidiaries whose earnings are not subject (are subject) to repatriation taxes. Panel D presents information on the holding structures of the MNCs in our sample. Panel E presents descriptive statistics for repatriation taxes (continuous) that apply in our sample. We present this information at the subsidiary country-industry level based on one-digit ICB industries. In Panel E, we also indicate the number of subsidiary-year observations for each subsidiary country-industry in our sample. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 3: Repatriation Taxes and Investment Efficiency

Variables	Prediction	(1)	(2)	(3)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		<i>RepatTax Measure</i>		
			Dummy	Continuous
<i>RepatTax</i>			0.205 (0.777)	0.020 (0.778)
<i>PE</i>	+	0.022* (1.955)		
<i>RepatTax*PE</i>	-		-0.025* (-1.916)	-0.002** (-2.177)
<i>RoA</i>		0.055*** (14.607)	0.055*** (14.574)	0.055*** (14.545)
<i>Size</i>		0.120*** (3.273)	0.125*** (3.408)	0.124*** (3.369)
<i>Tangibility</i>		0.041*** (11.551)	0.041*** (11.466)	0.041*** (11.461)
<i>DomesticCredit</i>		-0.033*** (-4.990)	-0.041* (-1.834)	-0.041* (-1.834)
<i>TotalParticipation</i>		0.004 (0.844)	0.003 (0.300)	0.003 (0.306)
<i>CashFlowParent</i>		0.017** (2.372)	0.025 (1.335)	0.026 (1.391)
<i>DomesticCredit*PE</i>			0.000 (0.215)	0.000 (0.203)
<i>TotalParticipation*PE</i>			0.000 (0.168)	0.000 (0.176)
<i>CashFlowParent*PE</i>			-0.000 (-0.300)	-0.000 (-0.423)
Observations		48,441	48,441	48,441
Adjusted R ²		0.061	0.063	0.062
Country-Industry Indicators		YES	NO	NO
Country-Industry Indicators*PE		NO	YES	YES
Country Indicators		NO	YES	YES
Industry Indicators		NO	YES	YES
Year Indicators		YES	YES	YES

Note: This table presents regression results for tests of the association between repatriation taxes and subsidiary-level investment efficiency estimated on the full sample. The dependent variable is *Investment*. All variables are defined in Appendix A. The regression in Column 1 (Columns 2 and 3) includes subsidiary country-industry and year fixed effects (subsidiary country, subsidiary industry, and year fixed effects). In Columns 2 and 3, we additionally include interactions of subsidiary country-industry fixed effects with *PE*. In Column 2 (3), *RepatTax* is an indicator variable (a continuous measure) for repatriation taxes. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 4: Information Asymmetry

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(6)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		Industry Affiliation		Subsidiary		Share Expatriate Managers	
		Same	Different	Direct	Indirect	High	Low
<i>RepatTax</i>		-0.035 (-0.848)	0.039 (1.069)	-0.013 (-0.284)	0.065** (2.529)	0.017 (0.317)	0.024 (0.849)
<i>RepatTax*PE</i>	? / -	0.001 (0.384)	-0.003* (-1.819)	-0.002 (-0.868)	-0.003** (-2.535)	-0.002 (-0.632)	-0.002* (-1.795)
<i>RoA</i>		0.067*** (9.767)	0.046*** (9.650)	0.052*** (7.726)	0.057*** (12.645)	0.055*** (7.584)	0.055*** (12.655)
<i>Size</i>		0.197*** (3.487)	0.069 (1.610)	0.081 (1.622)	0.136*** (3.110)	0.069 (1.340)	0.151*** (3.072)
<i>Tangibility</i>		0.041*** (6.610)	0.043*** (11.911)	0.049*** (9.445)	0.035*** (10.037)	0.045*** (8.228)	0.041*** (9.489)
<i>DomesticCredit</i>		-0.075*** (-3.196)	-0.019 (-0.632)	-0.062** (-2.126)	-0.023 (-0.974)	-0.076*** (-2.988)	-0.020 (-0.785)
<i>TotalParticipation</i>		0.013 (0.768)	-0.006 (-0.691)	0.026 (1.217)	-0.013 (-1.555)	0.007 (0.444)	-0.005 (-0.411)
<i>CashFlowParent</i>		-0.011 (-0.267)	0.033 (1.627)	0.051* (1.707)	0.006 (0.225)	0.028 (0.822)	0.022 (0.985)
<i>DomesticCredit*PE</i>		0.001 (1.147)	-0.000 (-0.261)	0.002 (1.015)	-0.001 (-0.918)	0.002* (1.700)	-0.001 (-0.882)
<i>TotalParticipation*PE</i>		-0.000 (-0.288)	0.000 (0.528)	-0.001 (-1.132)	0.001* (1.845)	0.000 (0.294)	0.000 (0.539)
<i>CashFlowParent*PE</i>		0.002 (0.797)	-0.001 (-0.777)	-0.001 (-0.387)	-0.000 (-0.052)	-0.001 (-0.520)	-0.000 (-0.157)
Observations		19,564	28,871	19,751	28,683	12,805	32,244
Adjusted R ²		0.078	0.056	0.066	0.068	0.071	0.064
Country-Industry Indicators*PE		YES	YES	YES	YES	YES	YES
Country Indicators		YES	YES	YES	YES	YES	YES
Industry Indicators		YES	YES	YES	YES	YES	YES
Year Indicators		YES	YES	YES	YES	YES	YES

Note: This table presents regression results for sample splits based on the degree of information asymmetry between the central management of an MNC and the subsidiary manager. The dependent variable is *Investment*. All variables are defined in Appendix A. All regressions include subsidiary country, subsidiary industry, and year fixed effects. We additionally include the interactions of subsidiary country-industry fixed effects with *PE*. In Columns 1 and 2, we split the sample based on whether the parent and the subsidiary operate in the same or in different industries based on 1-digit NACE codes. In Columns 3 and 4, we split the sample based on whether the parent directly or indirectly holds a subsidiary. In Columns 5 and 6, we split the sample based on whether the number of a subsidiary's managers with the same nationality as the parent is above or below the MNC-wide median. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 5: Monitoring

Variables	Prediction	(1)	(2)	(3)	(4)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		Full Ownership		Institutional Quality	
		Yes	No	High	Low
<i>RepatTax</i>		0.018 (0.589)	0.018 (0.387)	0.026 (0.692)	0.087*** (2.705)
<i>RepatTax*PE</i>	? / -	-0.001 (-1.071)	-0.004* (-1.684)	-0.002 (-0.939)	-0.004*** (-4.241)
<i>RoA</i>		0.052*** (11.783)	0.061*** (8.177)	0.051*** (10.995)	0.057*** (8.396)
<i>Size</i>		0.096** (2.276)	0.150** (2.443)	0.067 (1.534)	0.178*** (2.692)
<i>Tangibility</i>		0.047*** (10.870)	0.032*** (5.433)	0.044*** (9.137)	0.032*** (5.904)
<i>DomesticCredit</i>		-0.046* (-1.802)	-0.038 (-1.179)	-0.025 (-1.366)	-0.035 (-0.827)
<i>TotalParticipation</i>				0.002 (0.121)	0.016 (1.144)
<i>CashFlowParent</i>		0.018 (0.809)	0.054 (1.431)	0.013 (0.598)	0.027 (0.683)
<i>DomesticCredit*PE</i>		0.001 (0.398)	-0.000 (-0.215)	-0.001 (-0.905)	0.001 (0.545)
<i>TotalParticipation*PE</i>				-0.000 (-0.432)	-0.000 (-0.084)
<i>CashFlowParent*PE</i>		-0.000 (-0.142)	-0.001 (-0.712)	-0.000 (-0.159)	-0.000 (-0.070)
Observations		33,989	14,443	28,253	15,627
Adjusted R ²		0.060	0.079	0.058	0.074
Country-Industry Indicators*PE		YES	YES	YES	YES
Country Indicators		YES	YES	YES	YES
Industry Indicators		YES	YES	YES	YES
Year Indicators		YES	YES	YES	YES

Note: This table presents regression results for sample splits based on the degree of monitoring by the central management. The dependent variable is *Investment*. All variables are defined in Appendix A. All regressions include subsidiary country, subsidiary industry, and year fixed effects. We additionally include the interactions of subsidiary country-industry fixed effects with *PE*. In Columns 1 and 2, we split the sample based on whether the parent wholly or partially owns a subsidiary. In Columns 3 and 4, we split the sample based on whether the quality of institutions and corporate-governance mechanisms of the subsidiary country are above or below the sample median. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 6: Subsidiaries of Cash-rich MNCs

Variables	Prediction	(1)	(2)	(3)	(4)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		Subsidiary Cash Ratio		Internal Capital	
		Low	High	Low	High
<i>RepatTax</i>		-0.061 (-1.651)	0.051* (1.714)	-0.024 (-0.656)	0.039 (1.427)
<i>RepatTax*PE</i>	? / -	0.001 (0.443)	-0.003*** (-2.993)	0.000 (0.150)	-0.003*** (-2.770)
<i>RoA</i>		0.066*** (6.449)	0.052*** (12.298)	0.045*** (5.423)	0.058*** (13.059)
<i>Size</i>		0.120* (1.734)	0.127*** (3.519)	0.123** (2.172)	0.117*** (2.755)
<i>Tangibility</i>		0.034*** (5.571)	0.044*** (9.860)	0.036*** (6.274)	0.042*** (11.187)
<i>DomesticCredit</i>		-0.043 (-1.349)	-0.039 (-1.626)	-0.061** (-2.126)	-0.035 (-1.517)
<i>TotalParticipation</i>		0.001 (0.054)	0.003 (0.282)	-0.007 (-0.549)	0.004 (0.389)
<i>CashFlowParent</i>		-0.044 (-1.175)	0.038* (1.816)	0.033 (0.537)	0.064* (1.956)
<i>DomesticCredit*PE</i>		-0.000 (-0.276)	0.000 (0.290)	0.000 (0.182)	0.000 (0.170)
<i>TotalParticipation*PE</i>		0.000 (0.293)	-0.000 (-0.032)	0.001 (0.776)	0.000 (0.061)
<i>CashFlowParent*PE</i>		0.004* (1.733)	-0.001 (-0.973)	0.000 (0.132)	-0.003 (-1.442)
Observations		12,296	36,129	12,771	35,655
Adjusted R ²		0.078	0.061	0.059	0.067
Country-Industry Indicators*PE		YES	YES	YES	YES
Country Indicators		YES	YES	YES	YES
Industry Indicators		YES	YES	YES	YES
Year Indicators		YES	YES	YES	YES

Note: This table presents regression results for sample splits based on whether a subsidiary belongs to a cash-rich MNC. The dependent variable is *Investment*. All variables are defined in Appendix A. All regressions include subsidiary country, subsidiary industry, and year fixed effects. We additionally include the interactions of subsidiary country-industry fixed effects with *PE*. In Columns 1 and 2, we split the sample based on whether the subsidiary's cash ratio is in the bottom quartile or in the top three quartiles of the respective subsidiary country-industry. In Columns 3 and 4, we split the sample based whether the parent's operating-cash-flow-to-total-assets-ratio is in the bottom quartile or in the top three quartiles of the respective parent country-industry. In all Columns, we sort observations separately for observations subject to repatriation taxes and for those not subject to such taxes. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 7: Tax Reforms in the UK and Japan

Variables	Prediction	(1)	(2)	(3)	(4)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		UK vs. U.S.		Japan vs. U.S.	
		Post=2009	Pre-trend: Post=2008	Post=2009	Pre-trend: Post=2008
<i>Reform</i>		4.270*	1.103	2.330	0.094
		(1.912)	(0.644)	(1.618)	(0.101)
<i>Post</i>		0.358	-5.789**	2.353	-6.304***
		(0.174)	(-2.546)	(1.477)	(-3.763)
<i>Reform*Post</i>	-	-6.198*	1.816	-3.264*	3.447
		(-1.826)	(0.539)	(-1.946)	(1.591)
<i>Reform*PE</i>		-0.255**	-0.003	-0.203***	0.001
		(-2.340)	(-0.058)	(-2.647)	(0.030)
<i>Post*PE</i>		0.032	0.038	-0.007	0.014
		(0.269)	(0.465)	(-0.075)	(0.159)
<i>Reform*Post*PE</i>	+	0.370*	-0.187	0.309***	-0.262**
		(1.882)	(-1.617)	(2.977)	(-2.423)
<i>RoA</i>		0.042	0.028	0.073***	0.052**
		(1.639)	(1.173)	(4.119)	(2.289)
<i>Size</i>		-0.186	-0.115	0.014	0.098
		(-0.926)	(-0.611)	(0.116)	(0.686)
<i>Tangibility</i>		0.118***	0.164***	0.076***	0.121***
		(6.040)	(7.981)	(7.549)	(7.815)
<i>DomesticCredit</i>		0.771	-0.308	0.287	-0.265
		(1.324)	(-0.872)	(0.615)	(-0.945)
<i>TotalParticipation</i>		0.009	0.021	0.009	0.008
		(0.196)	(0.423)	(0.351)	(0.190)
<i>CashFlowParent</i>		-0.074	-0.019	0.040	0.099*
		(-1.054)	(-0.237)	(0.787)	(1.659)
<i>DomesticCredit*PE</i>		-0.023	0.015	-0.026	0.018
		(-0.611)	(0.793)	(-0.983)	(0.905)
<i>TotalParticipation*PE</i>		0.003	0.001	0.002	0.002
		(0.818)	(0.460)	(0.839)	(0.871)
<i>CashFlowParent*PE</i>		0.002	-0.001	-0.003	-0.006**
		(0.479)	(-0.207)	(-1.284)	(-2.375)
Observations		3,568	3,175	5,024	4,490
Adjusted R ²		0.060	0.114	0.065	0.121
PE*Country-Industry Indicators		YES	YES	YES	YES
Country Indicators		YES	YES	YES	YES
Industry Indicators		YES	YES	YES	YES

Note: This table presents regression results for difference-in-differences tests based on the tax reforms in the UK and Japan. The dependent variable is *Investment*. In Columns 1 and 2 (3 and 4), we include foreign subsidiaries of British (Japanese) MNCs as a treatment group (i.e. *Reform* takes the value of one) and foreign subsidiaries of U.S. MNCs as a control group (i.e. *Reform* takes the value of zero). The samples in Columns 1 and 3 (2 and 4) are limited to the years 2008-2009 (2007-2008). In Columns 1 and 3 (2 and 4), *Post* takes the value of one for the year 2009 (2008) and the value of zero for the year 2008 (2007). All variables are defined in Appendix A. All regressions include subsidiary country and subsidiary industry fixed effects. We additionally include the interactions of subsidiary country-industry fixed effects with *PE*. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 8: Repatriation Taxes and Subsidiary-level Cash Holdings

Variables	Prediction	(1) Coef. (t-stat)	(2) Coef. (t-stat)
<i>RepatTax</i>	+	0.083** (2.343)	0.079** (2.098)
<i>RoA</i>		0.162*** (13.784)	0.164*** (14.138)
<i>Size</i>		-1.960*** (-15.661)	-1.975*** (-15.832)
<i>Tangibility</i>		-0.176*** (-25.664)	-0.174*** (-24.733)
<i>DomesticCredit</i>		0.008 (0.931)	
<i>Total Participation</i>		0.021* (1.872)	0.019* (1.678)
<i>Cash Flow Parent</i>		0.033 (1.087)	0.028 (0.907)
Observations		48,453	48,298
Adjusted R ²		0.169	0.170
Country Indicators		YES	NO
Industry Indicators		YES	NO
Year Indicators		YES	NO
Country-Industry-Year Indicators		NO	YES

Note: This table presents regression results for tests of the association between repatriation taxes and subsidiary-level cash holdings estimated on the full sample. The dependent variable is *CashRatio*. All variables are defined in Appendix A. The regression in Column 1 (2) includes subsidiary country, subsidiary industry, and year fixed effects (subsidiary country-industry-year fixed effects). Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 9: Robustness Tests

Variables	Prediction	(1)	(2)	(3)	(4)	(5)	(5)
		Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
		Add M&A	Drop M&A=1	Add CashRatio	Add Sub Indicators	Add MNC Indicators	U.S. MNCs
<i>RepatTax</i>		0.020 (0.766)	0.019 (0.731)	0.021 (0.831)	-0.019 (-0.605)	-0.014 (-0.517)	0.043 (1.511)
<i>RepatTax*PE</i>	-	-0.002** (-2.170)	-0.002** (-2.110)	-0.002** (-2.219)	-0.003*** (-3.227)	-0.002** (-2.213)	-0.003** (-2.133)
<i>RoA</i>		0.054*** (14.499)	0.054*** (14.579)	0.056*** (14.907)	0.066*** (10.910)	0.055*** (14.295)	0.052*** (13.443)
<i>Size</i>		0.121*** (3.337)	0.097*** (2.727)	0.106*** (2.825)	2.611*** (14.355)	0.174*** (3.544)	0.116*** (3.201)
<i>Tangibility</i>		0.040*** (11.272)	0.038*** (10.320)	0.039*** (10.945)	0.231*** (24.038)	0.053*** (13.879)	0.041*** (10.283)
<i>DomesticCredit</i>		-0.041* (-1.833)	-0.043* (-1.930)	-0.041* (-1.826)	-0.046** (-2.045)	-0.048** (-2.288)	-0.031 (-1.445)
<i>TotalParticipation</i>		0.003 (0.289)	0.004 (0.475)	0.003 (0.318)		0.003 (0.358)	0.005 (0.586)
<i>CashFlowParent</i>		0.025 (1.343)	0.025 (1.296)	0.026 (1.362)	0.018 (0.660)	0.034 (1.516)	0.029 (1.472)
<i>M&A</i>		0.911*** (3.625)					
<i>CashRatioSubsidiary</i>				-0.009*** (-3.643)			
<i>DomesticCredit*PE</i>		0.000 (0.227)	0.000 (0.408)	0.000 (0.199)	0.000 (0.358)	0.001 (0.581)	-0.000 (-0.145)
<i>TotalParticipation*PE</i>		0.000 (0.209)	0.000 (0.063)	0.000 (0.184)	-0.001* (-1.675)	-0.000 (-0.775)	-0.000 (-0.000)
<i>CashFlowParent*PE</i>		-0.000 (-0.401)	-0.000 (-0.288)	-0.000 (-0.377)	0.000 (0.085)	-0.000 (-0.475)	-0.000 (-0.337)

Observations	48,441	45,655	48,441	46,607	48,122	43,527
Adjusted R ²	0.063	0.064	0.063	0.182	0.094	0.061
Country-Industry Indicators*PE	YES	YES	YES	YES	YES	YES
Country Indicators	YES	YES	YES	NO	YES	YES
Industry Indicators	YES	YES	YES	NO	YES	YES
Year Indicators	YES	YES	YES	YES	YES	YES
MNC Indicators	NO	NO	NO	NO	YES	NO
Subsidiary Indicators	NO	NO	NO	YES	NO	NO

Note: This table presents regression results for a set of robustness tests. In Column 1, we include *M&A* as an additional control variable. In Column 2, we drop observations if the parent or the subsidiary engaged in M&A activity in the subsidiary country in the current or in the previous year. In Column 3, we include *CashRatio* as an additional control variable. In Column 4, we include subsidiary fixed effects. In Column 5, we include MNC fixed effects. In Column 6, we limit observations subject to repatriation taxes to foreign subsidiaries of U.S MNCs. All variables are defined in Appendix A. All regressions (except for Column 4) include subsidiary country, subsidiary industry, and year fixed effects. In Column 4, the subsidiary fixed effects absorb the subsidiary country and industry fixed effects. We additionally include the interactions of subsidiary country-industry fixed effects with *PE*. Standard errors are clustered on the subsidiary country-industry level and t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).