REPATRIATION TAX COSTS AND FOREIGN INVESTMENT DECISIONS OF U.S. MULTINATIONALS:
EVIDENCE FROM THE ANTICIPATION OF THE 2017 U.S. TAX REFORM

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ABSTRACT

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In this study, I investigate whether the expectation of a future reduction in repatriation tax costs affects the foreign investment decisions of U.S. multinational corporations (U.S. MNCs). I find that, during the period in which members of Congress proposed legislation for a switch to a territorial tax system, foreign subsidiaries of U.S. MNCs significantly increased capital investment activities, compared to the subsidiaries of non-U.S. MNCs in the same country. The increase in capital investment is concentrated among subsidiaries of U.S. MNCs that are subject to higher potential repatriation tax costs, and hence would benefit more from a potential reform. Furthermore, I do not find any evidence consistent with the alternative explanation that agency costs of excess cash holdings drive the increases in investment during this period. On the contrary, the increases in foreign investment activities are marginally greater among subsidiaries that are subject to lower agency costs. Together, these results suggest that the expectation of lower future repatriation tax costs has inadvertently incentivized U.S. MNCs to invest more abroad. My study contributes to the literature that examines firms' real investment responses to anticipated tax incentives and our understanding of the consequences of the recent U.S. tax reform.

To Martin, for the amazing journey we have been on together.
And to Ed, for always being my guiding light.

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CHAPTER 1: INTRODUCTION

Prior to the passage of the Tax Cuts and Jobs Act of 2017 (TCJA), U.S. multinational corporations (MNCs) operated under a hybrid worldwide tax system. Under this system, U.S. MNCs were subject to incremental U.S. taxation on foreign earnings but could defer payment of the residual tax until the foreign earnings were repatriated to the U.S. parent. The tax incentive to delay repatriations led to trillions of dollars of cash being held by U.S. MNCs' foreign subsidiaries (Whalen, McKeon, & McCoy, 2017). The foreign cash holdings, which were considered "locked-out" due to the repatriation tax, have been the subject of intense public scrutiny because of the foregone tax revenue for the U.S. government. As a result, popular arguments in favor of the territorial tax reform have been to provide incentives for U.S. MNCs to repatriate foreign cash to boost domestic investment and employment (i.e., Dobridge and Landefeld 2017).

The paradox, however, is that an expectation for territorial tax reform can, in itself, alter U.S. MNCs' investment incentives. When the likelihood of reform is minimal, the firm operates as if a worldwide tax system is in place, and repatriation taxes are inevitable. In such a case, firms should repatriate earnings immediately and optimally operate at a low level of capital, which is dictated by the expected repatriation tax costs. However, as the likelihood of reform increases, the expected repatriation tax burden decreases, and the value of holding unrepatriated cash and capital investments increases (Albertus, Glover, and Levine 2019). In this study, I investigate whether and to what extent U.S. territorial tax reform's expectation influences the foreign investment decisions of U.S. MNCs during the pre-reform period.

Anticipatory actions, however, can be costly. Prior studies find that the expectation of future tax changes significantly affects investment decisions, as long as the adjustment costs are

low (e.g., Auerbach and Hines 1988). Given that investments in fixed assets are not easily

reversible and that the potential tax benefits are not guaranteed, U.S. MNCs may be unwilling to

incur the costs associated with such actions. Therefore, it is an open question whether the

expectation of territorial tax reform in the U.S. had an impact on U.S. MNCs' foreign investment

behavior.

To examine the above question, I exploit a setting in which there is a change in U.S.

MNCs' expectation of future repatriation tax costs. More specifically, I examine whether the

capital investment activities of U.S. MNCs' foreign subsidiaries increased during the period in

which members of the U.S. Congress introduced legislation for territorial tax reform. Although

the TCJA was enacted in late 2017, legislative efforts to reduce (or eliminate) repatriation taxes

on the foreign earnings of U.S. MNCs had been ongoing for several years. The first formal

proposal for a comprehensive reform of the U.S. tax system was officially introduced in

Congress by Senator Mike Enzi in 2012 (Sherlock 2014; Sherlock and Keightley 2016). A

subsequent flurry of tax-reform proposals from 2012 through the passage of the TCJA in 2017

created a period in which U.S. MNCs' expectations of a reduction in future repatriation tax costs

were likely to be heightened relative to prior years.

Using affiliate-level data from 2010 through 2016 from the Orbis database (by Bureau

van Dijk), I examine the change in investment behavior of U.S. MNCs' foreign subsidiaries from

a period of lower-anticipation to higher anticipation of tax reform. Based on the legislative

timeline, I identify the period from 2012 to the end of 2016 (the latest year with available data)

as a period of higher anticipation. During this time frame, I document a substantial increase in

both the net and gross investment ratios among U.S. MNCs' foreign subsidiaries relative to the

foreign subsidiaries of non-U.S. MNCs based in the same host country, but not subject to a tax

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on dividend repatriations.[1] This increase is both statistically and economically significant. The estimated net (gross) investment increase by foreign subsidiaries of U.S. MNCs is 11.1 (10.2) percentage points higher than for the average foreign affiliates of non-U.S. MNCs, during the period of higher anticipation. This effect is estimated after controlling for economic factors that have previously been shown to influence the investment decisions of foreign subsidiaries, as well as macroeconomic conditions in the host country and year and affiliate-level fixed effects.

Furthermore, I find that the increases in foreign investment are more pronounced among U.S. MNCs' subsidiaries whose parents are subject to higher repatriation tax costs. These are the subsidiaries that would benefit most from a reduction in repatriation tax costs and should have the strongest incentive to respond to the change in expectation of tax reform. Together, these findings suggest that the heightened expectation of territorial tax reform before the passage of the TCJA has inadvertently incentivized U.S. MNCs to invest more capital abroad. Such results are consistent with the direct effect of the expected repatriation taxes on foreign investment behavior predicted by economic theory (Poterba and Summers 1985; Albertus et al. 2019; Liu 2019).

The increase in foreign investments during the period of higher anticipation of territorial tax reform is distinct from U.S. MNCs' over-investment behavior due to excessive holdings of "locked-out" cash, as predicted by agency theory (e.g., Hanlon, Lester, and Verdi 2015; Edwards, Kravet, and Wilson 2016; Amberger, Markle, and Samuel 2018). I find that increases in foreign investment are marginally greater (or, in some cases, not statistically different) between subsidiaries subject to high and low agency conflicts with their parent firm. This result is inconsistent with an agency-based explanation. Although investment activities driven by agency costs are likely to be present during the period of my study, the cross-sectional results in

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[1] The ratio of current-year net (gross) investment in fixed assets to the total fixed assets at the start of the period, hereafter the "net investment ratio" ("gross investment ratio").

my study suggest that increases in foreign investment activities stemming from the anticipation of tax reform are more dominant during this period.

Regarding the timing of U.S. MNCs' responses, time-trend analyses indicate that U.S. MNCs started making significantly more foreign investments in 2015. The timing is not surprising, given the political developments in the preceding year. At the end of 2014, the Republican Party took over both the House and Senate in the mid-term elections. Shortly after, Rep. Dave Camp (R-MI) formally introduced a territorial tax reform bill in the House (Blake 2014; Rasmussen 2014). Rep. Paul Ryan (R-WI), who succeeded Rep. Camp as the Chairman of the House Ways and Means Committee in 2015, publicly pledged his commitment to introduce tax reform during his tenure (Lawder 2015). The political events in 2014 arguably heightened the expectation for comprehensive corporate tax reform and led to significant increases in foreign investment by U.S. MNCs in the subsequent years.

This study contributes to the literature in several ways. First, I provide evidence of how repatriation taxes directly affect the real investment decisions of U.S. MNCs. Extant studies of the U.S. primarily examine the effect of repatriation taxes on firms' corporate financial decisions, and the effect of locked-out cash on the agency costs of the firms, and hence, their investment decisions (e.g., Desai, Foley, and Hines 2001; Foley, Hartzell, Titman, and Twite 2007; Hanlon et al. 2015). Studies of the territorial tax reforms in 2009 in the U.K. and Japan provide conflicting evidence regarding the effect of these reforms on outbound investments, and may not be generalizable to the U.S. setting (Arena and Kutner 2015; Egger, Merlo, Ruf, and Wamser 2015; Feld, Ruf, Scheuering, Schreiber, and Voget 2016; Liu 2019). My study contributes to the literature by examining how expectations of territorial tax reform can affect

U.S. MNCs' real investment decisions abroad, and by providing empirical evidence that is consistent with predictions from economic theory.

Second, my study contributes to the literature that examines firm responses to an expectation of future changes in tax policies (e.g., King 1974; Auerbach and Hines 1988; Korinek and Stiglitz 2009; De Simone, Piotroski, and Tomy 2018). Fiscal policies influence firm behavior not only through changes in the levels of tax rates but also through the announcements of possible future changes (King 1974; Auerbach and Kotlikoff 1983). Such evidence has important implications for future studies that seek to examine the consequences of the TCJA.

Finally, this study joins a growing literature that focuses on the spillover effects of national tax policies in a global economy (e.g., Razin and Slemrod 1990; Ballard and Kang 2003; Matheson, Perry, and Veung 2013; Blagrave, Ho, Koloskova, and Vesperoni 2018; Kim, Nessa, and Wilson 2018). As such, I provide additional evidence of fiscal externalities, where one jurisdiction's tax rules and practices can influence the behavior of U.S. MNCs and have a significant economic impact on other jurisdictions (Keen, Perry, De Mooij, Matheson, Schatan, Mullins, and Crivelli 2014).

The rest of the dissertation proceeds as follows. The next chapter provides a literature review and presents the hypothesis development. Chapter 3 describes the sample. Chapter 4 describes the research design of the paper, including the identification strategy and regression models. Chapter 5 presents the sample selection process, descriptive statistics, and the main results. Chapter 6 provides additional analyses and robustness tests. Chapter 7 concludes and discusses the limitations of my study.

CHAPTER 2: LITERATURE REVIEW

2.1. Literature on the Effect of Dividend Tax on Investments

The effect of a dividend tax on capital investments has long been examined in the economics literature. While it is clear that double taxation of dividends results in a substantial burden for corporations, there has not been an agreement in this literature as to how much this tax affects a firm's investment decisions (Sinn 1991).

This literature dated as far back as the 1960s when the first general equilibrium model was introduced in Harberger (1962) to assess the efficiency costs of corporate income tax. In this paper, Harberger argues that distortions, such as those introduced by taxes, drive wedges between the marginal consumption benefits and marginal production costs, thereby creating deadweight losses in the equilibrium competitive market. The sum of the deadweight losses measures the efficiency cost or excess tax burden and is represented by the area often referred to as the "Harberger triangle." Prior to Harberger's work, the theory on deadweight loss was well-established, but economists rarely estimated the size of these losses (Hines 2001). Harberger's research introduced the first techniques to perform such calculations and led to an important reevaluation of the welfare effects of distortions in the economy (Hines 2001).[2] Using this technique, Harberger estimates that the U.S. corporate income tax generated distortions valued at 0.5% of the U.S. gross national product (Harberger 1954), that U.S. personal income tax generated welfare distortions valued at 0.4% of gross national product (Harberger 1964), and that all U.S. capital income taxes taken together were responsible for economic losses of 0.8% of gross national product (Harberger 1966).

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[2] A similar approach has also been used to estimate the deadweight losses arising from other sources of inefficiency such as government regulation and monopolistic practices.

Subsequent economists who studied the effect of dividend taxation on corporate

investment arrived at similar conclusions on the distortionary effect of taxes on welfare loss

(Kemp 1962, Feldstein 1978, McLure 1979, and Poterba and Summers 1985). Under the

traditional view, double taxation of income, such as dividend taxation, can have a detrimental

effect on corporate investment activities through its effect on a firm's cost of capital.[3] Assuming

that the payment of dividends has some intrinsic value to shareholders that it cannot be perfectly

substituted by other means of earnings allocation, double taxation of corporate income through

dividend taxes imposes an additional cost to the shareholders, and hence, negatively affects the

firm's cost of equity capital. Therefore, a reduction in dividend tax rates would lead to an

increase in dividend pay-out, a reduction in the firm's cost of capital, and a resulting increase in

corporate investments.[4]

The most notable alternative to the traditional view is the "tax irrelevance view". This

theory was initially introduced by Miller and Scholes (1978, 1982), and it holds that marginal

investors do not require a premium on returns to hold dividend-paying securities. This is due to

the various nuances in the U.S. tax code leaving most investors effectively untaxed on both

dividends and capital gains income. Hence, the irrelevance view implies that dividend taxes

should be non-distortionary and that changes in dividend tax rates or payouts policy should not

affect firm value as well as its investment decisions.

Building on the tax irrelevance view is a series of subsequent work in economics by King

(1974), Auerbach (1979, 1983), Bradford (1980, 1981), Fullerton and King (1984), Edwards and

Keen (1985), Sinn (1985, 1991) and others. The premise of this view is that the only way for

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[3] Cost of capital in the economics literature is defined as the minimum (or required) pre-tax rate of return an investment project must earn to be profitable (Sinn 1991, Sørensen 1995).
[4] Corporate investment appears is highly responsive to the firm's cost of capital (Hall and Jorgenson 1967; Cummins, Hassett, and Hubbard 1994; Caballero, Engel, and Haltiwanger 1995).

firms to "pass money through the corporate veil" is through dividend distributions. Because the market value of the firm is the present value of the future stream of after-tax dividends, shareholders should be indifferent whether the firms choose to retain earnings or pay dividends. In other words, for mature firms where the source of finance for new investment is retained earnings, the tax advantage of retained earnings is perfectly offset by the double taxation of future dividends. Shareholder's net return as well as firm's investment incentives should be unaffected by the tax on distributions. This view, therefore, predicts that an increase in dividend taxes would reduce the market value of corporate equity, but should not impact the firm's marginal incentive to invest. This stream of literature forms another school of thought in economics that is often referred to as the "new view," "trapped equity view," or "tax capitalization view."

Poterba and Summer (1985) question two main assumptions underlying the trapped equity view. The first issue relates to the assumption under the trapped equity view that dividend distributions are the only way for firms to return profits to investors. This is not the case for U.S. firms with viable options to convert earnings into capital gains through reduction in new equity issues as well as increase in share repurchases and takeovers. The second issue of the trapped equity view is the assumption that there is no intrinsic value in dividends distribution and that capital gains are the perfect substitute mechanism to transfer corporate earnings to shareholders. This view equates dividend payments as the residual amounts of the corporate profit, and hence, are subject to substantial variation. Signaling theory of dividends and the associated empirical evidence (i.e., Ross 1977, Bhattacharya 1979, Miller and Rock 1985) suggest that this is not that case. Overall, the new view does not appear to explain the pattern of dividend payouts among firms well (Poterba and Summer 1985).

The traditional view, on the other hand, assumes that firms would always require some level of equity financing, and double taxation of equity income in the form of dividend taxes will drive up the required rate of return on marginal investments. Furthermore, the traditional view assumes that shareholders prefer dividends over capital gains on shares[5] and demand lower returns for firms with higher dividend payouts. In this case, firms are able to reduce its cost of equity finance by increasing its dividend payout up to a point where the tax penalty on dividends offsets the marginal non-tax benefits (Sørensen 1995).

Whereas the new view primarily focuses on the *mature* firms with sufficient profits to meet all of its need for equity finance through retained earnings, economists in general do not deny the effect of dividend tax on immature or growing firms that heavily rely on new share issuances to finance investments (Sinn 1985; Sinn 1991). In particular, Sinn's (1991) article reevaluates both the old and the new view in assessing the dynamic effects of dividend taxation on a firm's growth path from birth to maturity. Young and immature firms may not have enough retained profits to finance all profitable investment projects and will require more equity funding. In this case, the net return on investment will be reduced by the full amount of dividend tax, and the cost of capital will be correspondingly higher (Sorensen 1995). Thus, for *immature* and *growing* firms, the conclusions from the old view appear to explain better the tax burden on firm's marginal investment.

Sinn (1991) pushes this argument further by claiming that the old view underestimates the cost of capital for young and immature firms. The reason is that given the cheapest source of financing for a firm is internally generated capital through profit retentions, it is optimal for firms

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[5] This preference could be because payment of dividends has some intrinsic value to the shareholders apart from being a means to allocate earnings to shareholders. There are two possible reasons for this phenomenon. Dividends can serve as a signal to shareholders about the performance of the company (e.g., Bhattacharya 1979, Miller and Rock 1985) and as a mechanism to reduce managerial discretion over the use of earnings (e.g., Jensen 1986).

to "economize on new share issue" and postpone investment until the firms begin to make a profit. The loss of opportunity to use cheaper means of financing at a later stage is an additional cost of capital imposed on the current investments for immature and growing firms. Therefore, Sinn (1991) predicts that at the start, firms are endowed with a small amount of capital in order to carry out the most profitable investment projects. They are then forced to generate more capital through retained earnings in the subsequent growth phase in order to finance the remaining profitable investment opportunities. The greater the dividend tax burden, the smaller the initial injection of equity, and the larger amount of investments will be financed by retention of profit during the growth phase.

In a related paper, Sinn (1991) analyzes how dividend taxation affects the growth of a corporate that starts with no equity capital. A paradoxical conclusion from the dynamic theory developed in this study is that "dividend taxes are distortionary before they are paid, but not when they are paid." In other words, dividend taxation will drive up the cost of capital during the early or growth phase, when firms *do not* pay dividends, whereas this tax will be neutral for firms in a stage of maturity where it pays dividends and dividend taxes. Sinn's subsequent paper (1993) extends this theory to the context of repatriation taxes and foreign direct investment, which I will discuss in the next subsection.

The empirical evidence on the effect of dividend taxes provides a range of mixed findings, some in support of the new view, while others in support of the traditional view. Poterba and Summers (1985) is the earliest study to empirically test the various hypotheses about the economic effects of dividend taxation using multiple dividend tax reforms passed in the United Kingdom between 1965 and 1973. The authors employ British data on security returns, dividend payout rates, and corporate investment from 1950 to 1983, and document empirical

evidence supporting the proposition that dividend taxes reduce corporate investment and distort capital allocation. The findings in this study reject the assumption underlying the tax capitalization view that firms pay dividends because marginal investors are not affected by dividend taxes.

In the U.S. context, there have been several studies examining the effects of dividend taxes on corporate payout and investment behavior using the (individual) dividend tax cut enacted in 2003. Dhaliwal, Krull, Zhen, and Moser (2005) investigate the effect of dividend taxes on firm cost of capital and document a positive relation between the implied cost of equity capital and the tax-penalized portion of dividend yield. This finding implies that tax cuts on shareholders' dividends can influence a firm's marginal investment through changes in cost of capital. Consistent with this story, Chetty and Saez (2005) document an unusually large (20%) increase in dividend payments by nonfinancial, nonutility publicly traded corporations following the cut. The response was strongest in firms with owners whose tax incentives changed substantially (i.e., those with large taxable institutional owners). In contrast, firms with high levels of nontaxable institutional ownership did not change payout policies. Such evidence supports the causal effect of dividend taxes on firms' aggregate dividend payouts. The findings from these studies appear to portray a picture consistent with the effect of investor's level dividend taxes on firm's cost of capital and investments as predicted by the traditional view.

Subsequent studies of the same tax cut, however, find contradictory evidence to Chetty and Saez (2005). Firms appear to substitute dividend payments with share buybacks, resulting in no change in total pay-outs (i.e., Brown, Liang, and Weisbenner 2007; Blouin, Raedy, and Shackelford 2011; Edgerton 2013). The most recent study, which utilizes corporate tax return data, shows that the 2003 dividend tax cut indeed boosted total corporate payouts (Yagan 2015).

Contradictory to findings in Dhaliwal et al. (2005), Yagan uses tax return data of S-corporations as a control group and documents *no* change in corporate investment and employee compensation as a result of the 2003 dividend tax cut. This finding appears to support the predictions from the new view that reductions in dividend tax do not affect a firm's cost of capital. However, as Yagan (2015) notes in the paper, the sample in his study comprises of primarily mature firms. The mean and median age of firms in his sample are 26 and 22 years. The lack of an investment effect can be seen as being consistent with Sinn's predictions for mature firms.

In another international setting, Alstadsaeter, Jacob, and Michaely (2017) use the dividend tax cut in Sweden to examine the effect of dividend taxes on corporate investments. Sweden passed a law in 2006 to cut the dividend tax rate by ten 10% for closely held corporations and 5% for widely held corporations. The authors find that the tax cut did affect the allocation of corporate investment. Cash-constrained firms increased investment after the dividend tax cut relative to cash-rich firms, and the effect is stronger among closely held firms that experience a larger tax cut. This result is also supported by higher external equity funding for cash-constrained firms and by higher dividend payouts by cash-rich firms after the tax cut. Together, the findings in this study appear to support the distinguished predictions for mature and immature firms from Sinn's model.

In summary, the impact of dividend taxation on corporate investment has been a subject of considerable analysis and intense debate in the economics and accounting literatures. Researchers have proposed and tested several competing theories. While the empirical evidence is somewhat mixed, the inference from current findings suggests that the impact of dividend taxation on corporate investment decisions is not homogenous across firms but depends on a

number of factors, including the firm's source and use of funds as well as the corporate payout policy.

2.2. Literature on the Effect of Repatriation Tax on Foreign Capital Investments

Prior to the 2017 Tax Cuts and Jobs Act, the United States operated under a worldwide-tax system that employed a 'residence' approach to taxing foreign source income. In other words, the U.S. taxed corporate income on a worldwide basis. Under this system, distributions from the foreign subsidiaries to the U.S. parent entity were subject to an incremental layer of tax. The foreign subsidiaries first pay income taxes in their home country when the earnings are generated, and then again when earnings are distributed back to the parent. This latter layer of tax is referred to as the "repatriation tax" and is eliminated as part of U.S. territorial tax reform under TCJA.[6]

An important feature of the previous tax system in the U.S. is what known as "deferral." With "deferral", U.S. MNCs were taxed on its foreign income only when those earnings were repatriated back to the U.S. parent. Until then, firms can continue to reinvest these earnings in foreign operations tax free. To reduce the burden of double taxation, the U.S. tax laws allow, with certain limitations, a foreign tax credit that offsets some of the U.S. repatriation taxes burden. This credit generally equals to the foreign taxes paid on the earnings. In other words, if the U.S. corporation tax exceeds the foreign tax, the residual U.S. tax on repatriated foreign earnings would equate to the difference between the two amounts. In contrast, if the foreign tax exceeds the U.S. tax, the company will not owe any incremental U.S. tax upon repatriation.[7]

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[6] The second type is a distribution of the corporation's after-tax earnings to its shareholders. The corporation first pays income tax on its taxable income, and then the individual shareholders pay income taxes on the dividends they receive.

[7] There are several exceptions to the deferral rules, including earnings of foreign branches and earnings from investments in passive assets (such as financial assets). These foreign-source incomes are subject to immediate U.S. taxation.

Given the importance of foreign direct investments (FDI) to most economies, the tax treatment of foreign income earned by multinational firms and how such taxes affect firms' investment decisions have become a vital issue for governments. The inferences from the literature examining the effect of dividend taxation on corporate investment discussed in section 2.1 shed light on our understanding of the potential effect of this type of dividend tax on foreign investments of U.S. MNCs.

There are also several schools of thought among prominent economists on the effect of the home country's tax policy on foreign direct investments by firms. The early school of thought was developed in Hartman's seminal paper (1985) examining the implications of the U.S.'s residence approach to taxing foreign source income on foreign investments. In this paper, Hartman argues that because the source of tax liability is the repatriation of earnings to parent companies, and not the earnings themselves, repatriation taxes should affect foreign investment differently depending on how funds are transferred within firms. This line of reasoning is analogous to the academic debates on the effect of the source of funding on a firm's cost of capital and the distinction between mature and immature firms (as explained in section 2.1). Under this view, a profit-maximizing firm should finance their foreign investment out of retained earnings to the greatest extent possible before seeking additional equity funding from the parent entity (Hartman 1985).

As Hartman shows in his paper, an immature foreign operations transition into the mature stage when the required rate of return increases to the point where the profitable foreign investment exhausts foreign earnings. As a result, mature foreign operations finance marginal investments using residual earnings (and pay the residual profit as dividends to their parent firm), and immature foreign operations rely on the funding from their parents (and usually do not pay

dividends). In term of foreign investment incentives, Hartman concludes that because home country taxation is an unavoidable cost, "home country's rate of tax on foreign source income and the presence or absence of a foreign tax credit should be irrelevant to a mature foreign operation's investment and dividend decisions" (Hartman 1985, 107). Investment decisions of young firm are, however, influenced by home country taxes. In short, home country taxation influences FDI financed by new equity but not FDI financed by retentions.

Hartman's paper (1985) sparked a series of subsequent research on the effect of home country taxation on international investment using time-series data (e.g., Boskin and Gale 1987, Newlon 1987, Slemrod 1990). Because U.S. balance of payments data on FDI is conveniently split between investments out of retained earnings and investments financed by new equity transfers, economists frequently utilize this data and regressing outbound FDI on home-country tax rates to empirically test the predictions implied from Hartman's model.

Boskin and Gale (1987) extended Hartman's study (1985) using a longer timeframe (from 1954 to 1984), alternative functional forms of the investment model, and more refined measures of tax rate and rates of return (as per Feldstein and Jun 1987). They find that even though the results are sensitive to sample period and model specifications, the qualitative conclusions of Hartman (1985) are robust. Newlon (1987) subsequently discovers a miscalculation of the after-tax rate of return on FDI used in the prior two studies. After making corrections to this measure, he found that the equation explaining retained earnings does not fit as well as the equation explaining equity transfers. The estimated coefficients are also sensitive to the time period considered.

These earlier works, however, ignore U.S. repatriation taxes and foreign home country taxes. Such exclusions are problematic, particularly in the case of FDI financed by new equity

transfers from the parent companies (OECD 2001). Slemrod (1990) went beyond earlier investigations to address this concern by looking at U.S. inbound investment between 1960-1987. He disaggregates the data into two separate series – one for investors from exemption-system countries (Canada, France, the Netherlands, and West Germany) and another for investors from foreign-tax-credit system countries (Italy, Japan, and the United Kingdom). The author adopts the effective marginal tax rate instead of the average tax rate to measure the incentive to undertake new investments. Overall, the results from this new empirical approach point to a negative effect of U.S. taxation on total FDI for new transfers of funds, but not for retained earnings. However, at the disaggregated level, the analyses do not provide much support for the predictions regarding the foreign countries' tax rates and the different systems of taxing foreign-source income (Slemrod 1990). The author suggests that the failure to find empirical evidence supporting the effected differences in FDI responses between exemption and foreign tax credit countries may be explained by data problems, especially with the difficulties in measuring marginal effective tax rates. The possibility of tax-planning to avoid repatriation taxes may also explain the lack of importance of home country tax effects.

Hines (1994) argues that the empirical evidence from prior studies (e.g., Hartman 1985, Boskin and Gale 1987, Newlon 1987, and Slemrod 1990) is difficult to interpret for two reasons. First, although the Hartman model implies that investment out of retained earnings for mature foreign operations is unaffected by its home-country tax rate, it does not imply that the aggregated investments out of retained earnings are unaffected. Because home country tax rates affect the level of initial equity transferred to foreign affiliates, this tax should affect the aggregate level of reinvested earnings. Second, the Hartman model applies only to mature subsidiaries that repatriate dividends, and they are only a subset of subsidiaries in any particular

country (Hines 1994). The author pointed to several studies that document U.S. foreign subsidiaries experience a period of internally-funded growth during their development. Hines and Hubbard (1990) and Altshuler and Newlon (1993) both report that the majority of U.S. foreign subsidiaries (70-84%) made zero dividend payments to their U.S. parent firms based on tax return data in 1984 and 1986.

Hines (1994) develops a new model to examine the effect of the "American-style credit and deferral system" on the time pattern of investments of the U.S. foreign subsidiaries. The results from his model imply that the U.S. tax system prior to TCJA, which granted credits for foreign taxes paid and permitted tax deferral for unrepatriated income, discourage firms to invest in new foreign investments using equity and instead to finance these investments with substantial amounts of debt. By keeping initial equity investment levels low, firms can reinvest their earnings as they accumulate profits, thereby creating greater opportunities for deferral than otherwise would be available. A clear implication from the model is that while the subsidiary's investment pattern depends on the form of the subsidiary's production function, subsidiaries in low-tax countries borrow in the early stages of their development and pay dividends only upon maturity.

Using country-by-country aggregate data of U.S. MNCs' foreign subsidiaries in 1984, Hines (1994) demonstrates that the behavior of the foreign subsidiaries of U.S. multinationals appears to be consistent with the effect of tax policy on firms' financial policy and foreign direct investment, as predicted by his model. Such findings have important implications for determining the influence of taxation on the level and direction of the real activities of multinational firms.

In the same study, Hines (1994) points out two features of the prior tax system in the U.S. that potentially would complicate the investment incentive faced by mature foreign subsidiaries of U.S. firms. The first complication is taxation on the basis that it is not a pure foreign tax credit system. The U.S. foreign tax credit system prior to TCJA 2017 imposes various limitations on available credits. When firms receive only partial foreign tax credits, home country taxation influences the size of the subsidiary's capital stock in the steady-state. The second complication is the difference between the definition of the host-country tax base for the purpose of income taxation and the definition of the home-country tax base for the purpose of calculating the foreign tax credit.[8] Because of this difference, Hartman's conclusion on the irrelevance of home-country taxation on the investment behavior of a dividend-paying subsidiary may no longer be valid (Hines, 1994).

Altshuler and Grubert (2001) examine the potential effect of adopting a dividend exemption system on the location incentives of foreign investment by U.S. corporations using various empirical approaches. The outcomes from this exercise provide no consistent and definitive evidence on how location incentives may change under the dividend exemption system. Their approach can be divided into three broad categories. First, they calculate the effective tax rate on foreign investment by U.S. firms under the worldwide tax system and under the territorial system to determine whether the latter would create an incentive to invest in low-tax countries. Their calculations suggest that foreign investment should not increase under a territorial system because the effective tax rates under this system would not differ significantly from the effective tax rates under the worldwide tax system. Second, they examine the effect of the territorial tax system on FDI by assessing whether FDI by companies which resident in

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[8] Hartman's analysis of the investment behavior of dividend-paying subsidiaries assumes that home and host governments define taxable income in the same way. In practice, this is often not the case.

countries with an exemption system (Canada and Germany) differed from FDI by U.S. companies. Whereas U.S. affiliates in the manufacturing industry invest more in Asia and their German and Canadian counterparts, U.S affiliates' investment in Ireland is substantially lower than that of the Canadian counterparts. This cross-country comparison provides a mixed picture of how location incentives may change under dividend exemption. Finally, they use 1996 tax return data to predict the probability that U.S. multinational firms would increase investment in low-tax countries under a territorial system. They find that because most U.S. corporations did not expect to pay taxes on repatriations with the significant foreign tax credit available, the magnitude of foreign investment increase would be small under a territorial tax system.

Subsequent researchers (e.g., Repetti 2007) have questioned several assumptions made in Altshuler and Grubert's (2001) study. There are two significant assumptions in the first test of their study. The first assumption is that because U.S. firms could time the repatriation of their foreign subsidiaries' income to minimize tax, they were effectively subject to an extremely low U.S. tax rate on repatriations (circa 3.3%). The second assumption is that firms with excess-limitation were able to allocate 75% of their overhead expenses to high-tax jurisdictions, and as a result, able to generate significant tax savings from such deductions. In contrast, they assume ftablethat under the territorial system such firms would be required to allocate their overhead expenses to the exempt income, thereby generating no U.S. tax benefit.

The low effective tax rates reported in Altshuler and Grubert's (2001) study were based on the assumption that firms could time the repatriation of their foreign subsidiaries' income to minimize tax. This is certainly true for multinational firms that have experience in managing foreign earnings and can cross-credit or use credit carryovers to minimize tax.[9] Firms lacking

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[9] More specifically, when analyzing a new equity investment, firms with experience in FDI have a history of managing foreign earnings that enables them to anticipate fairly accurately the extent that they will be able to cross

experience in managing dividend repatriations may believe that they faced an effective U.S. tax rate that is much higher. For inexperienced firms, the uncertainty and inability to use tax-reducing devices increase the risk of foreign investment and may deter them from making these investments. Switching to an exemption system may eliminate this uncertainty, decrease the risk associated with foreign capital transfers, and encourage firms to increase their foreign direct investment (Repetti 2007).

In estimating the economic burden on U.S. MNCs under the tax system prior to TCJA 2017 relative to an dividend exemption system, Desai and Hines (2004) conclude that prior studies (e.g., Altshuler and Grubert 2001, 2003; Grubert and Mutti 2000; Grubert 2003) attribute too little tax burden on unrepatriated foreign income held by U.S. MNCs.[10] Desai and Hines (2004) argue that it is even more likely that the unrepatriated income of foreign subsidiaries will be subject to higher repatriation taxes than is the repatriated income assuming that firms repatriate less income from low tax locations relative to high-tax locations.

Desai and Hines (2004) also note that there are a few common misunderstandings of the Hartman and Sinn models among researchers that lead to the "irrelevance" conclusion of the effect of home country taxes on FDI. The actual inference from these models is that the level of capitalization of a single foreign subsidiary in the steady-state is not a function of home country repatriation taxes. However, in the growth models (i.e., Newlon 1987, Sinn 1993, and Hines 1994), the net present value of foreign investment by a single subsidiary remains a function of repatriation taxes because such taxes influence the time path of investment. More importantly,

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credit taxes in high and low jurisdictions and generate tax carry forwards. This history enables the experienced firms to calculate what the tax burden will be on the repatriation of foreign investments. In contrast, firms lacking experience in FDI are not able to predict as accurately what their foreign tax credit position will be when they make foreign investments and when such investments mature. Moreover, such firms would also lack a sufficiently large pool of FDI that would enable them to cross credit and use other strategies to reduce U.S. tax (Repetti 2007).
[10] In these studies, the authors argue that the residual taxes on unrepatriated foreign earnings are minimal and should not affect U.S. MNCs' investments.

repatriation taxes influence the profitability of foreign investment in all of these models, and therefore, affect decisions of where and how much to invest (Desai and Hines 2004).

Based on the empirical evidence regarding the sensitivity of U.S.'s FDI to the tax treatment by home and host countries, Desai and Hines (2004) predict firms' behavioral responses to a switch to the territorial tax system: "U.S. firms would concentrate greater fractions of their foreign investment in low-tax countries, would undertake more aggressive actions to reduce foreign tax liabilities, would repatriate greater fractions of their foreign profits, particularly from low tax countries, would change their financing of foreign investment, would change the organizational form of their foreign operations, and would have more foreign investment in total" (Hines and Rice 2004, 17).

A few recent studies look at the two international settings (United Kingdom and Japan) to examine the effect of the switch to a territorial tax system on multinationals' foreign investment. In 2009, the U.K. and Japan passed territorial tax reforms and officially switched to a dividend exemption system. Arena and Kuttner (2015) and Egger et al. (2015) find that both Japanese and British firms made significantly less capital investment abroad after the switch. On the contrary, Feld et al. (2016) and Liu (2019) document significant increases in foreign capital investment by U.K. MNCs and foreign acquisition activities by both British and Japanese MNCs. Given the conflicting evidence from these studies, it is unclear how the U.K. and Japan's experience of territorial tax reform would generalize to the U.S. setting.

A concurrent working paper by Beyer, Downes, Mathis, and Rapley (2019) examines whether the decrease in internal capital market frictions, as a result of the elimination of repatriation taxes under TCJA 2017, leads to increases in firms' capital investment. They find that U.S. MNCs increase capital expenditures in the three-quarters following the enactment of

TCJA. However, because of the use of consolidated quarterly financial data, it is not clear whether the increase in investment documented in their paper is attributable to domestic or foreign investment. It is important to distinguish between two types of investment because repatriation taxes affect the two types of investment differently. Furthermore, their study does not address the issue of whether U.S. MNCs anticipate the lower repatriation tax costs in advance of the passage of the TCJA, and therefore, does not factor in behavior changes caused by tax reform expectation. This is the focus of my study.

2.3. Firm Anticipatory Responses to Potential Tax Policy Changes

An extensive literature in accounting examines firm responses ahead of an enacted change in tax rates. Several studies examining firm responses to the passage of the Tax Reform Act of 1986 (TRA) find evidence consistent with acceleration of deductions, deferral of income recognition, as well as financial and accounting discretion to maximize the expected tax benefits (i.e., Scholes, Wilson, and Wolfson 1992; Guenther 1994; Boynton, Dobbins, and Plesko 1992; Dhaliwal and Wang 1992; Gramlich 1991). Another example of firm responses to an expected tax increase is the spike in issuances of special dividends in the final months of 2012, before the expiration of the preferential tax rates on dividends under the Bush Tax Cuts (Hanlon and Hoopes 2014). Shareholders appeared to react positively to the announcements of these special dividends (Hribar, Savoy, and Wilson 2014). Together, the evidence from these studies is consistent with firms responding to expected changes in individual-level tax rates with the intent to maximize shareholder wealth.

Whereas the above stream of literature concentrates on firm responses ahead of enacted tax policy changes, my study focuses on firm anticipatory responses to a potential tax policy change. Theoretical work regarding firm anticipatory responses to potential tax policy changes dates back

to the 1970s (e.g., King 1974; Robson 1989; Korinek and Stiglitz 2009), but empirical evidence

of such behavior is scarce. King's (1974) seminal paper lays out the early theories regarding the

impact of personal and corporate taxation on corporate financial policy and investment through

the structure of firms' cost of capital. King emphasizes the importance of incorporating the

expectation of future changes in tax rates in estimating firms' optimal investment policy. Robson

(1989) incorporates this argument in his study of the effect of taxes on firms' cost of capital and

concludes that because the traditional measure of the cost of capital does not account for

anticipated changes in tax rates, it significantly understates the extent to which taxes affect

investment incentives. In modeling the impact of taxes on the demand for capital, Auerbach

(2005) emphasizes the need to account for expected changes in the tax system, and as a result,

the changes in the expected future cost of capital. Because the investment process takes time,

firms will care not only about the incentive to use capital today but also about the incentives to

use capital in the future (Auerbach 2005). The slower the adjustment process, the more weight is

attached to the expected future costs, and the more impact current decisions will have on future

capital use (Auerbach 1989).

Few prior studies document empirical evidence regarding firm responses to potential tax

policy changes (e.g., Auerbach and Hines 1988; De Simone et al. 2018; Kari, Karikallio, and

Pirttilä 2008). Auerbach and Hines (1988) study the historical pattern of U.S. corporate

investment incentives over the period between 1953 and 1986, and find that expectations of

future tax changes significantly affect the firm's incentive to invest, as long as the adjustment

costs are low. Kari et al. (2008) examine whether Finnish firms change in their dividend payouts

and investment policies ahead of the passage of the Finnish tax reform in 2005. The authors find

that Finnish firms whose shareholders expect to experience larger hikes in dividend tax costs start to increase their dividend payouts significantly immediately after the first proposal in 2002.

In a more recent study, De Simone et al. (2018) find that U.S. MNCs who expect larger benefits from a repatriation tax reduction began to accumulate significantly more global cash holdings after members of Congress proposed a second tax holiday in 2008. The authors also find that these U.S. MNCs engaged in complementary organizational and financial reporting activities that are designed to maximize the expected tax benefits of a potential tax holiday. In this study, I employ a similar approach to the case of U.S. tax reform and extend the investigation to the effect of such expectation on U.S. MNCs' real investment decisions.

CHAPTER 3: HYPOTHESIS DEVELOPMENT

As summarized in section 2, economic theory generally suggests that, assuming a constant repatriation tax rate (such as in the case where the likelihood of tax reform is minimal), the effect of repatriation tax costs on firms' foreign investment decisions depends on the source of capital funding. On the one hand, if foreign subsidiaries of U.S. MNCs require new equity funding from the parent entity, repatriation taxes create additional costs, lower the investments' returns, and discourage incremental foreign investments (Poterba and Summers 1985). On the other hand, if foreign subsidiaries of U.S. MNCs can self-finance investments using foreign retained earnings, then repatriation taxes should not materially affect their investment decisions (Hartman 1985; Sinn 1991).

When the likelihood of reform increases, the assumption of a constant repatriation tax rate is relaxed. In this case, theories suggest that the optimal investment policy will depend not only on the current repatriation tax costs but also on the expected repatriation tax costs in the future (King 1974; Korinek and Stiglitz 2009; Albertus et al. 2019). The expected repatriation tax burden on the firms decreases, causing the firm's marginal cost of investment to decrease. As a result, the value of holding unrepatriated cash and investing in foreign capital increases (Albertus et al. 2019). This result applies to all subsidiaries of U.S. MNCs, regardless of their source of funding (Korinek and Stiglitz 2009; Albertus et al. 2019; Liu 2019). In other words, the expectation of territorial tax reform can unintentionally alter U.S. MNCs' investment incentives during the period before the passage of the actual reform.

In Appendix A, I construct a simple multi-period model to illustrate how a change in the firm's expectation regarding future territorial tax reform will shift the optimal level of U.S. MNCs' foreign investment upwards. Holding other factors constant, the U.S. MNCs' optimal

level of foreign investment (I^*) is a negative function of the expected repatriation tax costs ($E[\tau_R^T]$). Lower expected repatriation tax costs in year T ($E[\tau_R^T] < \tau_R^0$) shift I^* upwards and provide incentives for value-maximizing MNCs to increase their foreign investments. Lower expected repatriation tax costs effectively reduce U.S. MNCs' current hurdle rate on foreign investments; this allows them to invest in some foreign investments whose net present value was previously negative.

Based on this theoretical prediction, my first hypothesis regarding the sensitivity of pre-TCJA foreign investment activities of U.S. MNCs to tax reform's expectation is stated in the alternative:

HYPOTHESIS 1: During the period in which U.S. territorial tax reform is more highly

anticipated, the foreign subsidiaries of U.S. MNCs increase their capital investment

overseas, relative to the foreign subsidiaries of non-U.S. MNCs.

Other factors could deter firms from engaging in such anticipatory actions. As mentioned earlier, Auerbach and Hines (1988) find that the expectations of future tax changes affect the decision to invest significantly as long as the adjustment costs are low. Because investments in operating assets are often irreversible, substantial adjustment costs may arise from over-investments, if the change in tax policy does not actually occur (De Waegenaere and Sansing 2008). Furthermore, firms may not be willing to alter their investment strategy before knowing for certain that legislation will be passed. Political uncertainty could deter risk-averse managers from changing their investment behavior in advance of the passage of tax reform (e.g., Pindyck 1990; Julio and Yook 2012; Jens 2017). As a result, the impact of reform expectation on U.S. MNCs' foreign investment decisions is an empirical question.

The main test relies on tax reform legislative developments to identify the change in the firms' expectations regarding future repatriation tax burden. This approach explicitly assumes that such events materially altered the firm's beliefs about the future cost of foreign investment. To further attribute documented effects to reform expectations, I examine how the increase in foreign investments varies with U.S. MNCs' repatriation tax costs during the pre-reform period. The decrease in the expected cost of foreign capital investments is directly associated with the pre-reform level of repatriation tax costs. U.S. MNCs subject to higher repatriation tax costs should benefit more from a future reduction in repatriation tax rate; therefore, they should respond more strongly to expectation of tax reform. Based on this prediction, the second hypothesis is also stated in the alternative:

HYPOTHESIS 2: During the period of higher anticipation of reform, the increase in investment activities of U.S. MNCs' foreign subsidiaries is greater among subsidiaries of U.S. MNCs with higher repatriation tax costs, relative to foreign subsidiaries of non-U.S. MNCs.

Lastly, I examine whether the predicted effect could alternatively be explained by the agency costs of excess cash holdings. Agency theory predicts that U.S. MNCs with excessive amounts of foreign cash holdings overinvest abroad due to increased agency conflicts associated with such cash holdings (e.g., Hanlon et al. 2015; Edwards et al. 2016; Amberger et al. 2018). Although these studies focus primarily on the period before the territorial tax reform discussion in the U.S., this effect could also exist during the period of my study. However, I argue that the surge in foreign investment activities as predicted in H1 is predominantly driven by the expected decline in the marginal cost of investment from future territorial tax reform. A lack of empirical evidence for the agency cost explanation provides further support for the direct tax channel (H3).

HYPOTHESIS 3: During the period of higher anticipation of reform, the increase in investment activities of U.S. MNCs' foreign subsidiaries is not greater among subsidiaries of U.S. MNCs with higher agency costs, relative to foreign subsidiaries of non-U.S. MNCs

CHAPTER 4: RESEARCH DESIGN

4.1.   Identification Strategy

To examine the above hypotheses, I examine the change in foreign investment activities of U.S. MNCs (the treatment group) from the lower-expectation period to higher-expectation period. This comparison is made relative to the investment activities (in the same location) made by non-U.S. MNCs that are not subject to repatriation taxes (the control group).

Figure 1 illustrates the identification strategy used for the research design. To estimate the change in foreign investment behavior of a U.S. MNC (Firm A) from the lower-expectation period to the higher-expectation period, I compare the change in the fixed asset investment ratios between the foreign subsidiary(ies) of Firm A (Sub X) and the subsidiary(ies) of Firm B (Sub Y). Firm B is an MNC located in a country with the territorial tax system. Both Sub X and Sub Y operate in foreign host country K. This approach has been adopted in prior studies that examine the territorial tax reforms in the U.K. and Japan and cross-border investment decisions of U.S. MNCs (e.g. Shroff, Verdi, and Yu 2013; Egger et al. 2015; Liu 2019).

Figure 1 ─ Empirical Approach

This figure outlines the empirical approach taken to examine the effect of tax reform anticipation on U.S. MNCs' foreign investment decisions.
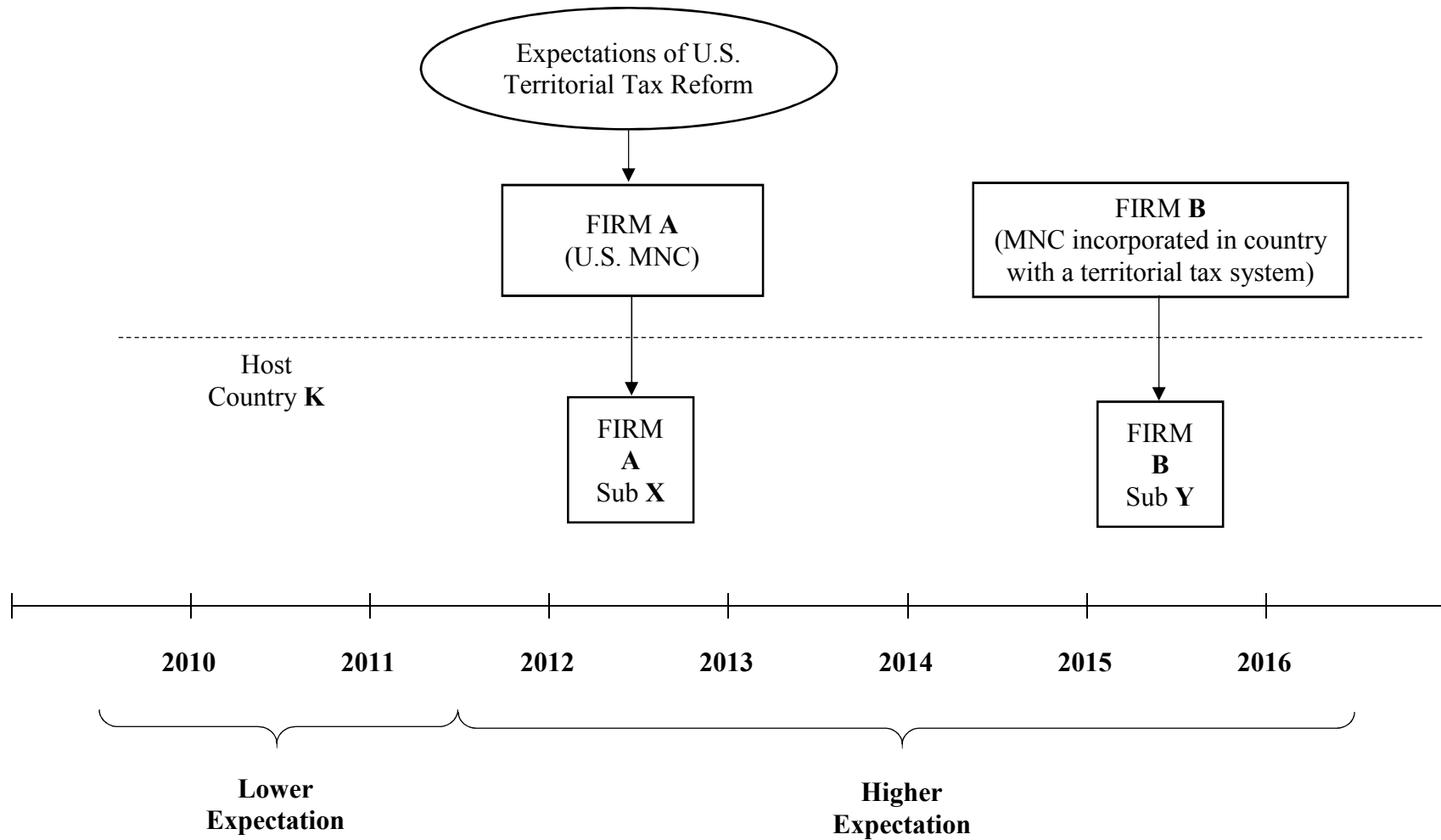
I follow the legislative timeline to identify the periods of higher and lower expectation of territorial tax reform. Table 1 summarizes the legislative efforts through 2017. After Congress failed to pass a proposal for a second tax holiday at the end of 2011, the legislative discussions moved in the direction of more fundamental and comprehensive tax reform (De Simone et al. 2018). Concerning international tax reform, the general spirit of subsequent bills was geared towards a substantial reduction or complete elimination of the tax on dividends remitted from foreign operations. This change would effectively allow the U.S. to switch from a worldwide tax system to one that is more akin to a territorial tax system.[11]

I define the period of higher-expectation to start in 2012 and to end in 2016, which is the latest year with available data. The pre-treatment period of lower expectation includes all prior years in the sample. In the main test, the pre-treatment period includes observations after 2009, to avoid potential confounding effects from the financial crisis in 2008.[12]

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[11] Certain elements of the new tax system in the U.S. do not constitute to a pure territorial tax system in theory, and therefore, is more similar to a participation exemption regime with the immediate taxation of certain foreign income. A participation exemption regime is one that exempts taxation on dividends repatriated from foreign subsidiaries to the U.S. parent entity. In addition, many participation exemption regimes exempt tax on the capital gains the sales of shares as long as a specified proportion of the company's share capital is held for a specified period of time.

[12] I extend the pre-treatment period to 2007 and find consistent results (see Table 12).

Table 1 － Legislative Timeline of Tax Reform Proposals						
Date		Name of the Bill	Comprehensive Reform	Corporate Tax Rate	Deemed Repatriation Tax Rates	Notes
Feb 2012	S. 2091	Sen. Enzi – *United States Job Creation and International Tax Reform Act of 2012*	Yes	N/A	N/A	• Shift to a territorial system • Allows a 95% dividend received deduction on *future* foreign-sourced dividends, which effectively reduces the dividend tax rate to 1.25% at the current tax rate. • Election to tax accumulated earnings with a 70% exclusion (a 10.5% tax) without foreign tax credits or at full rates when remitted with foreign tax credits.
July 2012	H.R.6169	Rep. Dreier - *Pathway to Job Creation Through a Simpler, Fairer Tax Code Act*	Yes	25%	14%	• Shift to a territorial system • No difference in the transition tax between liquid vs. illiquid assets.
Nov 2013		Sen. Max Baucus - *International Business Tax Reform Discussion Draft*	Yes	<30%	20%	• Two options: Tax all foreign income of U.S. companies immediately at a minimum tax rate or at a lower minimum rate if derived from actives business operation. • Transition tax payable over 8 years • No difference in the transition tax between liquid vs. illiquid assets.

Table 1 (cont'd)						
Feb/ Dec 2014	H.R.1	Rep. Dave Camp – *Tax Reform Act of 2014*	Yes	25%	3.5% - 8.75%	• Shift to a territorial system • Exempt 95% of the foreign-source portion of dividends received by a U.S. corporation from a foreign corporation in which the U.S. corporation owns at least a 10% stake. • Mandatory toll charge on tax-deferred foreign earnings: 8.75% (in the case of accumulated earnings held in cash, cash equivalents or certain other short-term assets) or 3.5% (in the case of accumulated earnings invested in property, plant and equipment • Payable over 8 years
Feb 2015		President Barack Obama *FY 2016 Budget Proposal*	No	28%	14%	• One-time tax on previously untaxed foreign income is payable over 5 years • No difference in the transition tax between liquid vs. illiquid assets • A minimum rate of 19% on foreign income going forward
Feb 2016		President Barack Obama *FY 2017 Budget Proposal*	No	28%	14%	• One-time tax on previously untaxed foreign income is payable over 5 years • No difference in the transition tax between liquid vs. illiquid assets • A minimum rate of 19% on foreign income going forward

Table 1 (cont'd)						
June 2016		Speaker Paul Ryan and Chairman Kevin Brady - *A Better Way Tax Reform Plan*	Yes	20%	3.5% - 8.75%	• Shift to a territorial system • Low one-time deemed repatriation tax • Tax deferred foreign earnings at 8.75% for earnings held in cash or cash equivalents and otherwise at 3.5% • Payable over 8 years • Border adjustments tax
Sept 2017		Trump – *Tax Reform That Will Make America Great Again*	Yes	15%	10%	• Low one-time deemed repatriation tax • No difference in the transition tax between liquid vs. illiquid assets • An end to the deferral of taxes on corporate income earned abroad • Shift to a territorial system
Nov 2017	H.R.1	House of Republican Tax Reform Bill - Tax Cuts and Jobs Act	Yes	20%	7% - 14%	• Shift to a territorial system • Low one-time deemed repatriation tax • Payable over 8 years in equal annual installments • The original proposal proposed bifurcate rates of 12% and 5% for liquid and illiquid assets.
Nov 2017	H.R.1	Senate Tax Reform Bill – Tax Cuts and Jobs Act	Yes	20%	7.5% - 14.5%	• Shift to a territorial system • Low one-time deemed repatriation tax • Payable over 8 years • The original proposal proposed bifurcate rates of 10% and 5% for liquid and illiquid assets.

Table 1 (cont'd)						
Dec 2017	H.R.1	Conference Committee	Yes	21%	8% - 15.5%	• Shift to a territorial system • Low one-time deemed repatriation tax • Payable over 8 years

Sources: Institute on Taxation and Economic Policy (November 28, 2016), Bloomberg Tax – Tax Reform Roadmap (December 18, 2017)

CRS Report - Tax Reform an Overview of Proposals in the 112th, 113rd, and 114th Congress, Proposals Released on the House of Ways and Means Website (https://waysandmeans.house.gov), the Senate Website (https://www.senate.gov/), and the White House website (https://www.whitehouse.gov/)

4.2. Regression Model

To test the effect of reform anticipation on foreign investment in fixed assets empirically,

I adopt a similar approach to Arena and Kutner (2015) and Liu (2019) in the following model:

$$INVESTMENT_{i,t} = \beta_1 + \beta_2 * \textbf{USAFF}_{it} * \textbf{POST}_{it} + \beta_3 * SIZE_{i,t-1} + \beta_4 * ROA_{i,t-1} +$$

$$\beta_5 * OPERMARGIN_{i,t-1} + \beta_6 * SALESGROWTH_{i,t-1} + \beta_7 * LEVERAGE_{i,t-1} + \beta_8$$

$$* CASH\_TA_{i,t-1} + \beta_9 * SIGMAROA3_{i,t} + \beta_{10} * DIFF\_STR_{i,t} + \beta_z * \textbf{Z}_{kt} + \alpha_i + \delta_t + \varepsilon_{it} (1)$$

where i indexes subsidiaries, t indexes time, and k indexes the host country where the affiliate is

located. The analysis is performed at the affiliate level, using financial data from Orbis (provided

by Bureau van Dijk). Applying the identification strategy discussed above at the affiliate level

effectively permits a within-year comparison of investment activities between U.S. and non-US

MNCs' subsidiaries in the same host country.

The coefficients in the above regression are estimated using ordinary least squares, with

INVESTMENT measured by both the firm's net and gross investment in fixed assets. The firm's

net capital investment, *NET_INVT,* is calculated as the ratio of current-year net investment in

fixed assets to total fixed assets at the beginning of the year. The current-year net investment is

the change in net book value of fixed assets from year *t-1* to *t*, and thus approximates capital

expenditures net of annual depreciation charges. Prior research has also adopted an alternative

measure of *gross* investment in fixed assets from year *t-1* to *t* (*GROSS_INVT*), by adding back

depreciation charges in year *t* (i.e., Amberger et al. 2018; Liu 2019). However, because

depreciation data are not available for all observations, the sample size is reduced using this

measure.

The coefficient of interest is β_2, the coefficient on the interaction term (*USAFF*POST*).

USAFF is an indicator that equals one for foreign subsidiaries of U.S. MNCs and zero

otherwise.[13] *POST* is an indicator for a change in the reform expectations of U.S. MNCs and equals 1 for observations between 2012 and 2016 and zero otherwise. The coefficients on the individual terms, *USAFF* and *POST*, are dropped due to the inclusion of both affiliate and year fixed effects. To the extent that a change in U.S. MNCs' reform expectation results in increases in foreign capital investments, I expect β_2 to be positive.

The control variables include proxies for economic factors shown to affect a subsidiary's investments (e.g., Shroff et al. 2013; Liu 2019). At the subsidiary level, these include the scale of business operations, growth opportunities, profitability, operating efficiency, capital structure, liquidity, and operational risk. I use the log of total assets as the proxy for the scale of business operations (*SIZE*), annual sales growth as the proxy for growth opportunities (*SALESGROWTH*), and return on assets as the proxy for the subsidiary's profitability (*ROA)*. Operating profit margin (*OPERMARGIN*) is included to control for the subsidiary's operating efficiency. The ratio between total long-term debt and total assets (*LEVERAGE*) and the ratio between total cash and cash equivalents and total assets (*CASH_TA*) are included to control for the subsidiaries' capital structure and liquidity. These control variables are lagged by one year to avoid mechanical relations with the dependent variables. The subsidiary's operational risk is proxied for by the three-year ROA volatility (*SIGMA_ROA3*).

I also control for investment incentives that are due to the difference between the statutory tax rates of the countries where the parent and the subsidiary locate (*DIFF_STR*). Time-varying macroeconomic factors of the host-countries ($\boldsymbol{Z}_{kt}$) include GDP per capita in USD (log), GDP growth (in percentage points), and the unemployment rate (in percentage points).

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[13] As such, the control group are the subsidiaries of non-U.S. MNCs located in countries that do not impose repatriation taxes.

A full set of subsidiary- (α_i) and year-fixed effects (δ_t) are also included. Subsidiary fixed effects effectively incorporate parent-subsidiary country-pair fixed effects and parent entity fixed effects. These fixed effects also help control for unobserved time-invariant differences between subsidiaries, bilateral relationships between the parent's and subsidiary's countries, and differences in investment policies across parent entities. The subsidiary fixed effects also incorporate host-country fixed effects, which control for time-invariant differences that may affect the investment choices of multinationals, such as differences in language, geographical distance between the host country and the parent country, corruption, governance, availability of workforce, and protection of property rights, that may affect MNCs' investment choices. In addition, by including a set of time dummies, I effectively control for the effects of time-variant aggregate macroeconomic shocks that affect both the treatment and control groups.

4.3.   Cross-sectional Tests

The research design above assumes that legislative events after 2012 materially altered firms' beliefs about future repatriation tax rates. To further attribute the documented effects to anticipated tax reform, in the first cross-sectional test, I examine how the behavior of U.S. MNCs varies with their pre-reform repatriation tax costs. The expected net benefits from proactive actions should be larger for the group of subsidiaries that are subject to higher repatriation tax costs, and therefore experience a larger drop in the expected cost of foreign investments.

I measure the repatriation tax costs at the consolidated level instead of at the level of the foreign subsidiary because U.S. MNCs operate in multiple jurisdictions simultaneously and are able to offset tax credits among foreign jurisdictions.[14] To measure the U.S. MNCs' overall

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[14] Prior to TCJA, the United States taxed U.S. MNCs on their worldwide income but allowed a credit against the U.S. tax liability on foreign-source income for the income taxes paid to foreign countries. However, there was a limit to the extent to which a firm could claim foreign tax credits. Instead of setting a limit for each foreign country U.S. MNCs were allowed to combine their worldwide income when calculating the limit of the foreign tax credit.

repatriation tax cost, I adopt a proxy (*REPAT*) that has been commonly used in prior literature (Foley et al. 2007; Hanlon et al. 2015). Following Foley et al. (2007), I calculate *REPAT* as the U.S. MNCs' consolidated foreign pretax income multiplied by the difference between the U.S. statutory tax rate and the annual foreign effective tax rate, scaled by the group's lagged total assets. *REPAT* is set to zero if the foreign effective tax rate is greater than the U.S. statutory tax rate. Foreign subsidiaries of U.S. MNCs are then split into groups of high and low repatriation tax cost, based on the median values of *REPAT*.

The second cross-sectional test explores whether the increase in foreign investment activities in the period of high expectation of reform is due to the agency costs of tax-induced cash holdings. Prior studies rely on measures of the parent's ability to monitor its foreign subsidiaries, and the level of oversight costs between these parties, to proxy for agency costs (Shroff et al. 2013; Amberger et al. 2018). Stronger monitoring by the parent entity reduces the potential for agency-driven actions by the managers of foreign subsidiaries. Lower costs of overseeing foreign operations are associated with lower information asymmetry within MNCs and more effective monitoring by the parent entity. If the increases in foreign investment documented in my tests of H1 are due to agency-driven behavior, then the effect should be stronger among subsidiaries that are subject to higher agency costs.

I employ several proxies for monitoring and information-acquisition costs. Prior studies find that higher ownership by the parent entity facilitates better monitoring (Ang, Cole, and Lin 2000; Antras, Desai, and Foley 2009). Thus, to test H3, I split the sample based on whether the subsidiaries are fully or partially owned and compare the estimated effects between these two

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This approach allows for "cross-crediting," where credits paid in excess of U.S. tax in one country can be used to offset U.S. tax in a country in which the foreign tax is lower than the U.S. tax (Ballard 2008). Furthermore, tax credits are divided into baskets that separate passive income and active income, and cross-crediting can also occur across types of income.

groups. Second, parents operating in the same industry as the subsidiary face lower oversight costs and thus engage in more effective monitoring (Grinblatt and Keloharju 2001). To test H3, I split the sample based on whether the parent and the subsidiary share the same 1-digit NACE code. Third, Asiedu and Esfahani (2001) argue that the quality of corporate governance mechanisms of the subsidiary country shape the parent's oversight costs, and hence the level of monitoring. Following Amberger et al. (2018), I use the World Bank's Corporate Governance Indicator as a measure of the quality of corporate governance mechanisms at the country level and separate the sample at the median of the total score.

Finally, prior studies interpret geographical distance and the existence of a common language between the parent and the subsidiaries as measures of information-acquisition cost and information asymmetry (Grinblatt and Keloharju 2001; Anderson and Van Wincoop 2004; Di Giovanni 2005). Lower information-acquisition costs and information asymmetry between the parent entities and the subsidiaries lead to fewer agency issues. Following Shroff et al. (2013), I measure the geographical distance as the distance between the capitals of the parent's and subsidiary's countries of incorporation. I also perform an additional cross-sectional test based on whether there is a common language between the parent's country and the subsidiary's host country. These variables are obtained from the World Bank's website.

CHAPTER 5: DATA AND RESULTS

5.1. Sample Selection

Orbis provides unconsolidated financial statement data of multinational subsidiaries around the world wherever filings are required. However, the data in Orbis are limited to the ten most recent reporting years for the same company (i.e., 2007-2016). As previously mentioned, the final dataset for this study excludes the years before 2010 to avoid confounding effects of the 2008 financial crisis. The sample period covers the period between 2010 and 2016.

I follow the approach set out in Shroff et al. (2013) and Amberger et al. (2018) to identify affiliates that file unconsolidated financial statements and their ultimate parent entity. I then drop all subsidiaries with no or limited financial statement data, and those that file consolidated financial statements (Orbis consolidation code "C1" or "C2"). Following the standard procedure in the literature, I exclude all subsidiaries in industries with unique investment patterns, including financial holding companies (NACE code 7010), financial industries (NACE code 6400-6899), and utility industries (NACE code 3500-3999). Observations that report negative total assets, fixed assets, or cash and cash equivalents are also eliminated. To focus solely on the U.S. reform discussion, I exclude all affiliates with an ultimate parent entity located in countries other than the U.S. that operated under a worldwide tax system during the sample period. Finally, I drop all observations in countries where there is not both a U.S.-affiliate and a non-U.S.-affiliate. This step ensures that for a treated affiliate, there will be at least one control affiliate in the same country-year to which comparisons can be made. The final sample includes 170,992 affiliate-year observations over a period between 2010 and 2016.

5.2.   Descriptive Statistics

Table 2 presents the sample composition, by year, for the final sample from Orbis. As
shown in this table, the number of affiliate observations is well-populated for all years from 2010
to 2016.

Table 2 ─ Affiliate Sample Composition from Orbis

Year	Treatment	Control	Total Observations
2010	1,659	20,350	22,009
2011	1,750	22,375	24,125
2012	1,728	22,895	24,623
2013	1,744	23,579	25,323
2014	1,859	24,358	26,217
2015	1,930	24,476	26,406
2016	1,677	20,612	22,289
Total	12,347	158,645	170,992

Table 3 and 4 includes a frequency table of the sample by affiliates' country and parent's
country, respectively. The majority of U.S. MNCs' affiliates are located in the European
Economic Area (EEA), with the top five countries being France, the United Kingdom, Italy,
Spain, and Germany. Similarly, the parent entities for the majority of the affiliates in the sample
are located in the EEA countries, as well as in Belgium, Norway, and Russia.

Table 3 — Sample Composition from Orbis
Total Number of Observations by Affiliates' Country

Affiliate Country	Total US Affiliates	Total Non-US Affiliates	Total Affiliates	% of total	% of US Affiliates
Australia	134	647	781	0.46%	20.71%
Austria	131	1,542	1,673	0.98%	8.50%
Belgium	578	7,118	7,696	4.50%	8.12%
Bosnia and Herzegovina	24	572	596	0.35%	4.20%
Brazil	1	31	32	0.02%	3.23%
Bulgaria	130	1,060	1,190	0.70%	12.26%
China	36	368	404	0.24%	9.78%
Colombia	266	719	985	0.58%	37.00%
Croatia	89	1,688	1,777	1.04%	5.27%
Czech Republic	360	3,814	4,174	2.44%	9.44%
Denmark	51	402	453	0.26%	12.69%
Estonia	43	734	777	0.45%	5.86%
Finland	140	1,781	1,921	1.12%	7.86%
France	1,679	25,008	26,687	15.61%	6.71%
Germany	965	7,886	8,851	5.18%	12.24%
Greece	171	930	1,101	0.64%	18.39%
Hungary	96	1,214	1,310	0.77%	7.91%
Iceland	3	90	93	0.05%	3.33%
Indonesia	7	73	80	0.05%	9.59%
Ireland	139	297	436	0.25%	46.80%
Italy	1,341	23,141	24,482	14.32%	5.79%
Korea, Rep.	114	869	983	0.57%	13.12%
Latvia	65	940	1,005	0.59%	6.91%
Lithuania	7	240	247	0.14%	2.92%
Luxembourg	110	635	745	0.44%	17.32%
Malta	8	324	332	0.19%	2.47%
Netherlands	65	390	455	0.27%	16.67%
New Zealand	59	137	196	0.11%	43.07%
Norway	334	6,357	6,691	3.91%	5.25%
Pakistan	7	9	16	0.01%	77.78%
Philippines	56	404	460	0.27%	13.86%
Poland	425	3,814	4,239	2.48%	11.14%
Portugal	318	5,021	5,339	3.12%	6.33%
Romania	190	1,584	1,774	1.04%	11.99%
Russian Federation	183	6,679	6,862	4.01%	2.74%
Serbia	44	2,228	2,272	1.33%	1.97%
Slovak Republic	145	1,990	2,135	1.25%	7.29%
Slovenia	25	1,493	1,518	0.89%	1.67%
South Africa	6	36	42	0.02%	16.67%
Spain	1,112	15,072	16,184	9.46%	7.38%
Sweden	278	4,017	4,295	2.51%	6.92%

Table 3 (cont'd)

Affiliate Country	Total US Affiliates	Total Non-US Affiliates	Total Affiliates	% of total	% of US Affiliates
Thailand	7	306	313	0.18%	2.29%
Turkey	37	449	486	0.28%	8.24%
Ukraine	1,044	20,858	21,902	12.81%	5.01%
United Kingdom	1,324	5,678	7,002	4.09%	23.32%
Total	12,347	158,645	170,992	100%	

Table 4 ─ Sample Composition from Orbis
Number of Observations by Parents' Country

Parent-Country	Total Affiliates	% of total
Austria	3,704	2.33%
Belgium	6,105	3.85%
Canada	1,088	0.69%
Cyprus	8,027	5.06%
Denmark	1,824	1.15%
Finland	3,314	2.09%
France	25,455	16.05%
Germany	14,209	8.96%
Italy	19,110	12.05%
Japan	5,988	3.77%
Luxembourg	3,531	2.23%
Netherlands	4,611	2.91%
Norway	5,250	3.31%
Portugal	2,506	1.58%
Russia Federation	5,481	3.45%
Serbia	1,460	0.92%
Slovenia	1,467	0.92%
Spain	11,352	7.16%
Sweden	5,706	3.60%
Switzerland	5,456	3.44%
Ukraine	3,174	2.00%
United Kingdom	10,184	6.42%
Others	3,704	6.08%
Total	158,645	100%
United States	12,347	

Table 5 presents the descriptive statistics of all variables used in the main tests for the overall sample (Panel A), the treatment group (Panel B), and the control group (Panel C). All continuous variables are winsorized at 1% and 99%.[15] The variable definitions are provided in Appendix B. Compared with the subsidiaries of non-U.S. MNCs over the sample period, the subsidiaries of U.S. MNCs are significantly larger (higher values of *SIZE*) and more profitable (higher values of *ROA*). Subsidiaries of U.S. MNCs are less leveraged and hold more cash. However, subsidiaries of U.S. MNCs appear to have lower sales growth (lower values of *SALESGROWTH*). Finally, over the whole sample period, the average annual growth in net (gross) fixed asset investment reported for the subsidiaries of U.S. MNCs are 0.281 and 0.594. These averages are higher than the average investment levels of non-U.S. subsidiaries during the same period (0.213 and 0.456 respectively).

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[15] To winsorize continuous variables, I replace the values below the 1st and above the 99th percentiles with the values at the 1st and 99th percentiles, respectively.

Table 5 ─ Descriptive Statistics

Period 2010-2016	N	Mean	Std. Dev.	P25	P50	P75
Panel A: All Observations						
NET_INVT	170,992	0.218	1.925	-0.206	-0.073	0.068
GROSS_INVT	139,823	0.467	2.156	-0.038	0.064	0.282
CASH_TA	167,779	0.121	0.176	0.007	0.044	0.160
CASH_NETTA	167,753	0.289	1.164	0.007	0.046	0.190
SIZE(t-1)	170,992	8.908	2.270	7.470	8.966	10.419
ROA(t-1)	170,992	0.019	0.301	-0.019	0.033	0.113
OPER_MARGIN(t-1)	170,992	-0.228	2.028	-0.014	0.031	0.087
SALES_GROWTH(t-1)	170,992	0.317	2.043	-0.143	-0.008	0.157
LEVERAGE(t-1)	170,992	0.089	0.218	0.000	0.000	0.052
CASH_TA(t-1)	170,992	0.118	0.172	0.007	0.043	0.156
SIGMA_ROA3	170,992	0.101	0.188	0.020	0.045	0.102
DIFF_STR	170,992	0.015	0.075	0.000	0.000	0.040
GDPGROWTH	170,992	0.992	2.749	0.183	1.188	2.308
GDPCAPITA	170,992	10.025	0.953	9.572	10.458	10.656
UNEMPLOYMENT	170,992	10.221	5.262	7.170	8.870	11.690

Table 5 (cont'd)

Period 2010-2016	N	Mean	Std. Dev.	P25	P50	P75
Panel B: Treatment group						
NET_INVT	12,347	0.281	2.088	-0.224	-0.076	0.092
GROSS_INVT	10,505	0.594	2.376	-0.029	0.096	0.366
CASH_TA	12,116	0.163	0.201	0.016	0.080	0.235
CASH_NETTA	12,115	0.397	1.219	0.017	0.086	0.307
SIZE(t-1)	12,347	9.205	2.171	7.947	9.333	10.647
ROA(t-1)	12,347	0.039	0.306	-0.001	0.056	0.139
OPER_MARGIN(t-1)	12,347	-0.083	1.333	0.001	0.040	0.093
SALES_GROWTH(t-1)	12,347	0.278	1.869	-0.117	0.005	0.158
LEVERAGE(t-1)	12,347	0.073	0.212	0.000	0.000	0.002
CASH_TA(t-1)	12,347	0.158	0.195	0.016	0.076	0.226
SIGMA_ROA3	12,347	0.103	0.190	0.021	0.048	0.104
DIFF_STR	12,347	0.135	0.065	0.091	0.125	0.195
GDPGROWTH	12,347	1.358	2.766	0.490	1.481	2.604
GDPCAPITA	12,347	10.148	0.874	9.865	10.508	10.669
UNEMPLOYMENT	12,347	9.853	5.236	6.810	8.520	10.650
REPAT	5,934	0.010	0.014	0.001	0.006	0.015
Panel C: Control group						
NET_INVT	158,645	0.213	1.912	-0.205	-0.073	0.067
GROSS_INVT	129,318	0.456	2.137	-0.039	0.062	0.276
CASH_TA	155,663	0.118	0.173	0.006	0.042	0.154
CASH_NETTA	155,638	0.280	1.160	0.006	0.044	0.182
SIZE(t-1)	158,645	8.885	2.276	7.436	8.933	10.400
ROA(t-1)	158,645	0.018	0.300	-0.021	0.031	0.111
OPER_MARGIN(t-1)	158,645	-0.240	2.072	-0.016	0.030	0.087
SALES_GROWTH(t-1)	158,645	0.320	2.056	-0.145	-0.009	0.157
LEVERAGE(t-1)	158,645	0.090	0.218	0.000	0.000	0.057
CASH_TA(t-1)	158,645	0.115	0.169	0.006	0.041	0.150
SIGMA_ROA3	158,645	0.101	0.188	0.019	0.045	0.102
DIFF_STR	158,645	0.005	0.067	0.000	0.000	0.020
GDPGROWTH	158,645	0.963	2.746	0.183	1.188	2.273
GDPCAPITA	158,645	10.016	0.958	9.571	10.368	10.651
UNEMPLOYMENT	158,645	10.250	5.263	7.280	8.870	11.690

Note: All observations are at the affiliate level. * denotes statistically significant differences, at the one percent level (two-tailed) between the subsamples of U.S.-affiliates (which are subject to repatriation tax) and non-U.S.-affiliates (which are not subject to repatriation tax).
Complete variable definitions are provided in Appendix B.

Table 6 presents the Pearson correlations among the regression variables. The control variables are significantly correlated with the *NET_INVT* and *GROSS_INVT* variables in the expected directions.

Table 6 — Pearson Correlation

	Variable Names	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	NET_INVT_{it}	1								
(2)	$GROSS\_INVT_{it}$	**0.930**	1							
(3)	$CASH\_TA_{it}$	0.000	**0.031**	1						
(4)	$CASH\_NETTA_{it}$	**-0.011**	0.018	0.654	1					
(5)	$SIZE_{it-1}$	**-0.058**	**-0.100**	**-0.213**	**-0.131**	1				
(6)	ROA_{it-1}	0.004	-0.005	0.059	**0.007**	0.140	1			
(7)	$OPER\_MARGIN_{it-1}$	**-0.010**	**-0.019**	0.016	-0.026	0.060	0.256	1		
(8)	$SALES\_GROWTH_{it-1}$	0.053	0.051	-0.009	*0.005*	-0.042	-0.020	-0.021	1	
(9)	$LEVERAGE_{it-1}$	**-0.021**	**-0.038**	**-0.107**	**-0.048**	0.104	**-0.146**	**-0.031**	0.025	1
(10)	$CASH\_TA_{it-1}$	**0.063**	**0.085**	**0.793**	**0.495**	**-0.205**	**0.080**	**0.020**	0.002	**-0.113**
(11)	$SIGMA\_ROA3_{t}$	**0.030**	**0.061**	**0.121**	**0.101**	**-0.316**	**-0.422**	**-0.135**	**0.097**	**0.052**
(12)	$DIFF\_STR_{t}$	-0.004	0.003	**0.094**	**0.040**	**0.023**	**0.043**	**0.034**	**-0.021**	**-0.032**
(13)	$GDPGROWTH_{kt}$	**0.031**	**0.011**	**0.028**	0.000	**0.128**	**0.061**	**0.041**	**0.008**	***-0.017***
(14)	$GDPCAPITA_{kt}$	-0.003	0.003	**0.032**	-0.010	**0.365**	**0.092**	**0.070**	**-0.050**	**0.021**
(15)	$UNEMPLOYMENT_{kt}$	-0.007	**-0.014**	**-0.053**	**-0.030**	**-0.028**	**-0.031**	**-0.016**	*-0.006*	**0.065**

	Variable Names	(10)	(11)	(12)	(13)	(14)
(10)	$CASH\_TA_{it-1}$	1				
(11)	$SIGMA\_ROA3_{t}$	**0.099**	1			
(12)	$DIFF\_STR_{t}$	**0.088**	-0.003	1		
(13)	$GDPGROWTH_{kt}$	**0.035**	**-0.063**	**0.066**	1	
(14)	$GDPCAPITA_{kt}$	**0.043**	**-0.200**	**-0.087**	**0.164**	1
(15)	$UNEMPLOYMENT_{kt}$	**-0.061**	**-0.030**	**-0.020**	**-0.220**	-0.038

Correlation coefficients in bold (italics) are significantly different from zero at the 0.01 (0.05) level. Complete variable definitions are provided in Appendix B.

5.3.   Main Results

5.3.1   Foreign Capital Investments

Figure 2 and 3 plot the yearly average net and gross fixed asset investment ratios of the treatment and control groups. In line with the prediction from prior theory, I observe a noticeable divergence in the foreign fixed asset investment ratios of U.S. MNC's and non-U.S. MNCs' affiliates in the post-2011 period.

Figure 2 ─ Comparison of Average Net Investment Ratio
Between Foreign Subsidiaries of U.S. MNCs and non-U.S. MNCs
Period 2010-2016
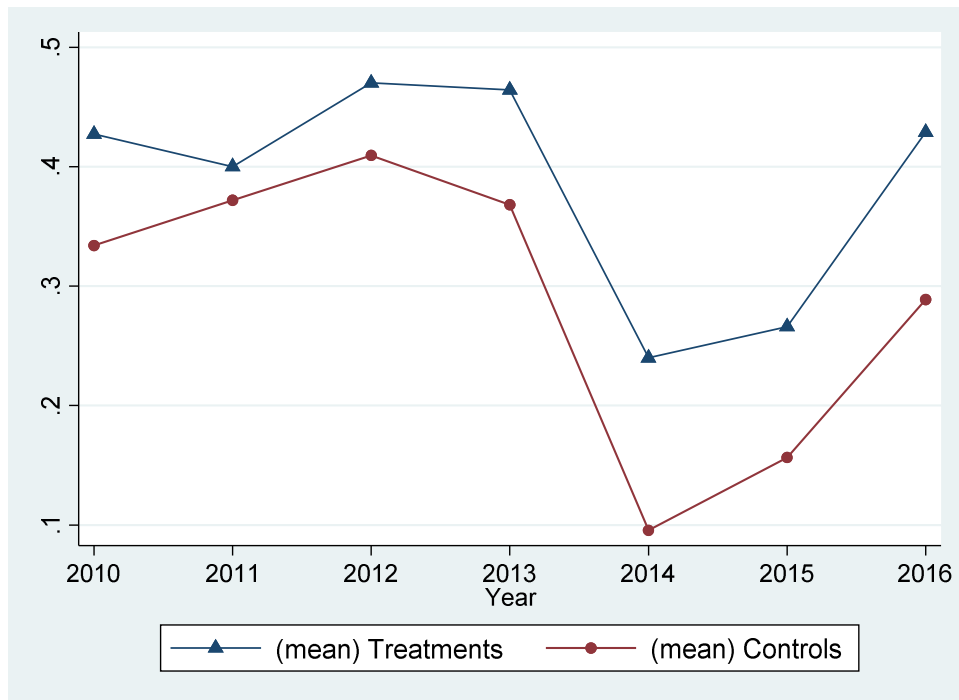
Figure 3 ─ Comparison of Average Gross Investment Ratio
Between Foreign Subsidiaries of U.S. MNCs and non-U.S. MNCs
Period 2010-2016
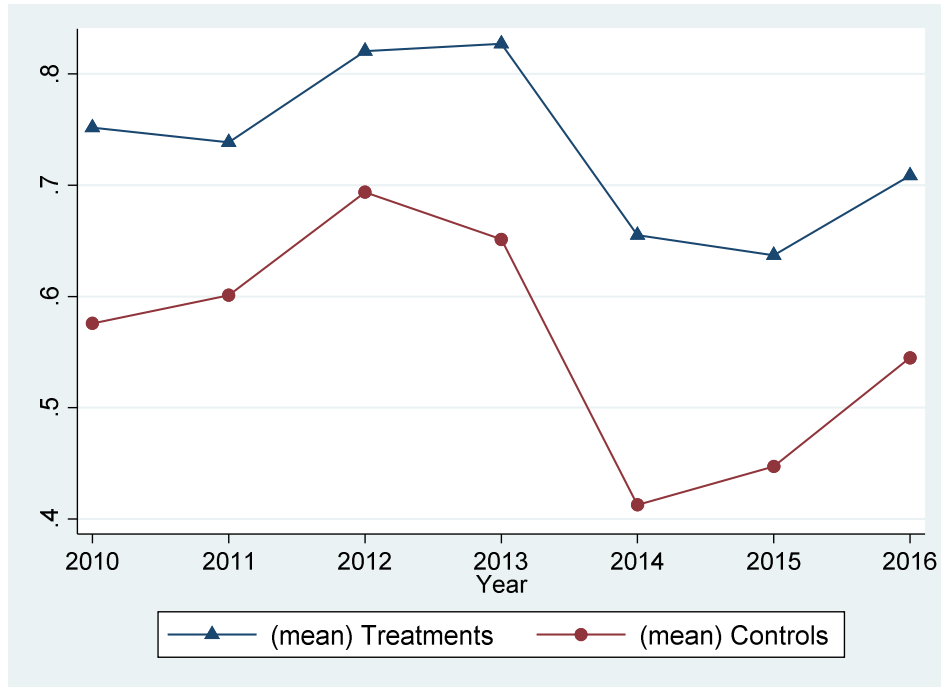
To test empirically whether these observed increases are significant, I estimate Eq. (1) to

obtain the treatment effect. The results are presented in Table 7. The dependent variables in

Table 7 are the ratios of affiliates' net (gross) investment in fixed assets as a portion of the total

fixed assets at the beginning of the year.

Table 7
Regression Results for Fixed Asset Investment (H1)

Variables	(1) Net Fixed Asset Investment Ratio	(2) Gross Fixed Asset Investment Ratio
POST*USAFF$_{it}$	**0.111****	**0.102***
	(2.480)	**(1.908)**
SIZE	-0.742***	-0.959***
	(-23.634)	(-21.862)
ROA	0.211***	0.374***
	(4.741)	(5.295)
OPER_MARGIN	-0.008	-0.019*
	(-1.405)	(-1.745)
SALES_GROWTH	0.022***	0.019***
	(4.838)	(2.896)
LEVERAGE	-0.373***	-0.397***
	(-6.346)	(-5.377)
CASH_TA	1.104***	1.155***
	(11.576)	(9.721)
SIGMA_ROA3	-0.199***	-0.142
	(-3.319)	(-1.424)
DIFF_STR	-0.893***	-0.125
	(-2.891)	(-0.325)
GDPCAPITA	0.018***	0.010***
	(6.665)	(2.741)
UNEMPLOYMENT	0.816***	1.260***
	(8.558)	(8.979)
GDPGROWTH	0.010**	0.011**
	(2.233)	(2.073)
N	170,992	137,854
Adjusted R-Sq	0.0653	0.1250
Affiliate FE	Yes	Yes
Year FE	Yes	Yes

Notes: This table presents the results of estimating the equation (1) with affiliate and year fixed effects. Column (1) presents the results using net fixed asset investment ratio as the dependent variable and Column (2) presents the results using gross fixed asset investment ratio as the dependent variable. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

In column (1), when the net investment ratio is the dependent variable, the coefficient on the interaction term between the *POST* and treatment $USAFF_{it}$ indicators is positive (0.111) and statistically significant at the 5% level. As shown in column (2), when gross investment ratio is used as the dependent variable, the coefficient on the interaction term remains positive (0.102) and statistically significant at the 10% level. The coefficients on the control variables are statistically significant and have the expected signs. Together these results indicate that, after controlling for factors known to affect a subsidiary's capital investment, the foreign affiliates of U.S. firms invest more in fixed assets than other affiliates operating in the same host country during the period of higher expectation of tax reform. This finding is consistent with H1.

5.4. Cross-sectional Results

5.4.1. The Direct Cost of Capital Channel

Table 8 presents the results from the first cross-sectional test based on repatriation tax costs (*REPAT*).[16] I split the treatment group at the median value of *REPAT* and create an indicator for each of the subgroups with high and low repatriation tax costs (*ABOVEMED_REPAT* and *BELOWMED_REPAT)*.

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[16] *REPAT* is a proxy for incremental U.S. tax imposed by the U.S. worldwide tax system if the firm repatriates foreign earnings in year *t*. Following Nessa (2017), I also calculate a second proxy for repatriation tax costs using the current foreign effective tax rate averaged over a three-year period instead of the annual foreign effective tax rate. The inferences with respect to H1 are unchanged. The results are untabulated for brevity.

Table 8

Cross-Sectional Regression Results for Repatriation Tax Costs (H2)

Variables	(1) Net Investment Ratio	(2) Gross Investment Ratio
ABOVEMED_REPAT*POST	**0.210****	**0.194***
	(2.388)	**(1.802)**
BELOWMED_REPAT*POST	**-0.065**	**-0.101**
	(-0.709)	**(-0.983)**
ABOVEMED_REPAT	-0.118	0.028
	(-0.329)	(0.100)
BELOWMED_REPAT	0.006	0.095
	(0.018)	(0.343)
SIZE	-0.747***	-0.965***
	(-23.031)	(-21.279)
ROA	0.207***	0.361***
	(4.438)	(4.888)
OPER_MARGIN	-0.006	-0.016
	(-1.095)	(-1.472)
SALES_GROWTH	0.021***	0.017***
	(4.434)	(2.628)
LEVERAGE	-0.372***	-0.393***
	(-6.221)	(-5.170)
CASH_TA	1.115***	1.172***
	(11.285)	(9.548)
SIGMA_ROA3	-0.213***	-0.139
	(-3.462)	(-1.356)
DIFF_STR	-1.275***	-0.616
	(-4.150)	(-1.568)
GDPGROWTH	0.017***	0.007*
	(6.070)	(1.944)
GDPCAPITA	0.825***	1.280***
	(8.469)	(8.907)
UNEMPLOYMENT	0.010**	0.012**
	(2.385)	(2.221)
Coeff Difference (p-value)	***0.2742 (0.029)***	***0.2946 (0.050)***
N	164,348	132,591
Adjusted R-Sq	0.0668	0.1270
Affiliate & Year FE	Yes	Yes

Notes: This table presents the first cross-sectional test based on repatriation tax costs (*REPAT*). *ABOVEMED_REPAT* and *BELOWMED_REPAT* are indicators for each of the subgroups with above- and below-median level of repatriation tax costs. Column (1) and (2) present the results using net and gross fixed asset investment ratio, respectively, as the dependent variable. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

As expected, the coefficients capturing the net and gross investment ratios among the U.S. MNCs' affiliates with high repatriation tax costs are positive (0.210 and 0.194) and statistically significant at the 5% and 10% level. The coefficients capturing the net and gross investments among the U.S. MNCs' affiliates with low repatriation tax costs are slightly negative and statistically insignificant. The differences between the coefficients estimated for the subgroups are statistically significant, as reported at the bottom of the table. Together, the results indicate that the increases in foreign fixed asset investments are concentrated among subsidiaries of U.S. MNCs that have higher repatriation tax costs. This finding is consistent with the prediction of H2 that foreign affiliates which will benefit more from a reduction in repatriation taxes respond more strongly to the anticipation of potential tax reform.

5.4.2. The Agency Cost Channel

Table 9 presents the results for the cross-sectional tests across different proxies of agency costs. Agency theory predicts that U.S. MNCs that are subject to higher repatriation tax costs accumulate more foreign cash. The excessive holdings of such cash worsen the agency conflicts between the parent entity and the managers of the foreign subsidiaries, allowing these managers to overinvest abroad. If agency costs are the driver of the increases in foreign investment documented in H1, then the effect should be stronger among the foreign subsidiaries that are potentially subject to higher agency costs.

Panel A of Table 9 presents the results for the tests based on the parent's ownership level. The higher the ownership by the parent entity, the less agency cost expected to be between the parent and the subsidiaries. The dependent variable is the net investment ratio in Columns 1 and 2, and the gross investment ratio in Columns 3 and 4. For both proxies of investment, the coefficients on the interaction term are positive and statistically significant (at the 5% level)

among the subgroup of affiliates that are fully owned and controlled by the parent entity

(Columns 1 and 3). For the subgroup of affiliates that are partially owned, the coefficients on the

interaction term are smaller in magnitude and are statistically insignificant (Columns 2 and 4).

As reported at the bottom of this table, the difference between the estimated coefficients for the

subgroups is statistically significant (z-stats = 1.800 using the net investment ratio and 1.932

using the gross investment ratio). Together, these results provide evidence that the increase in

foreign investment is concentrated among fully-owned affiliates, which are likely to encounter

less agency conflicts.

Table 9 ─ Cross-Sectional Regression Results for Agency Costs (H3)
Regression Results Based on Ownership Level

Variables	Net Investment Ratio		Gross Investment Ratio	
	Fully_Owned	*Part_Owned*	*Fully_Owned*	*Part_Owned*
	(1)	(2)	(3)	(4)
POST*USAFF$_{it}$	**0.132****	**-0.038**	**0.164****	**-0.062**
	(2.207)	**(-0.515)**	**(2.312)**	**(-0.672)**
SIZE	-0.793***	-0.866***	-0.998***	-1.121***
	(-17.376)	(-15.127)	(-15.454)	(-14.091)
ROA	0.175***	0.215***	0.372***	0.405***
	(2.727)	(2.677)	(3.853)	(2.984)
OPER_MARGIN	-0.002	-0.014	-0.024*	-0.009
	(-0.320)	(-1.462)	(-1.807)	(-0.462)
SALES_GROWTH	0.021***	0.027***	0.014*	0.032***
	(3.306)	(3.480)	(1.729)	(2.643)
LEVERAGE	-0.284***	-0.392***	-0.352***	-0.430***
	(-3.544)	(-3.337)	(-3.461)	(-2.905)
CASH_TA	1.015***	1.392***	1.127***	1.390***
	(7.705)	(7.566)	(6.829)	(6.319)
SIGMA_ROA3	-0.219**	-0.157	-0.135	-0.094
	(-2.476)	(-1.570)	(-0.910)	(-0.581)
DIFF_STR	-0.738	-0.852	-0.392	-1.080
	(-1.538)	(-1.389)	(-0.665)	(-1.487)
GDPGROWTH	0.023***	0.024***	0.009*	0.004
	(5.753)	(4.530)	(1.750)	(0.610)
GDPCAPITA	0.586***	0.834***	1.374***	1.300***
	(4.113)	(4.603)	(6.346)	(5.071)
UNEMPLOYMENT	0.009	0.002	0.012	0.005
	(1.411)	(0.213)	(1.513)	(0.463)
Z-stats (P-value)	*1.800 (0.079)*		*1.932 (0.062)*	
N	87,745	59,667	71,762	47,200
Adjusted R-Sq	0.0601	0.0813	0.1180	0.1420
Affiliate & Year FE	Yes	Yes	Yes	Yes

Notes: This table presents the results of the cross-sectional tests across different proxies of agency costs. Panel A provides the result of the tests based on the parent's ownership level for both dependent variables of net and gross investment ratios. Panel B and Panel C of this Table present the results of the cross-sectional tests across proxies of cross-border information-acquisition cost and information asymmetry. Net foreign investment ratio is used as the dependent variable in Panel B, and gross foreign investment ratio is used as the dependent variable in Panel C. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

Panel B and Panel C of Table 9 present the results for the cross-sectional tests across proxies of cross-border information-acquisition costs and information asymmetry. Net investment ratio is used as the dependent variable in Panel B, and gross investment ratio is used as the dependent variable in Panel C. Across all proxies examined, differences between the estimated coefficients for the subgroups are not statistically significant. The results are consistent across both panels. Together, the results from this set of cross-sectional tests suggest that the increase in foreign investment activities among affiliates of U.S. MNCs during the period of higher-expectation of tax reform is unlikely due to the agency-driven suboptimal behavior from holding excessive foreign cash.

Table 9 (cont'd) ─ Panel B: Additional Cross-Sectional Regression Results for Agency Costs (H3)
Dependent Variable: Net Investment Ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High_WGI	Low_WGI	Close_Dist	Far_Dist	Same_NACE	Diff_NACE	Same_Lang	Diff_Lang
POST*USAFF$_{it}$	**0.075**	**0.061**	**0.154****	**0.039**	**0.201***	**0.080***	**0.088***	**0.200**
	(1.206)	**(0.940)**	**(2.516)**	**(0.585)**	**(1.854)**	**(1.661)**	**(1.896)**	**(1.110)**
SIZE	-0.712***	-0.707***	-0.718***	-0.782***	-0.683***	-0.745***	-0.743***	-0.697***
	(-13.602)	(-16.455)	(-17.910)	(-14.730)	(-6.573)	(-22.647)	(-22.709)	(-5.450)
ROA	0.148	0.166***	0.176***	0.231***	0.269*	0.208***	0.199***	0.421**
	(1.595)	(2.974)	(2.798)	(3.636)	(1.819)	(4.464)	(4.307)	(2.257)
OPER_MARGIN	-0.006	-0.002	-0.007	-0.005	-0.034	-0.007	-0.006	-0.058
	(-0.598)	(-0.282)	(-1.102)	(-0.533)	(-1.277)	(-1.259)	(-1.025)	(-1.436)
SALES_GROWTH	0.015**	0.025***	0.013**	0.040***	0.035	0.021***	0.023***	0.002
	(1.987)	(3.708)	(2.352)	(4.656)	(1.437)	(4.568)	(4.789)	(0.137)
LEVERAGE	-0.405***	-0.245***	-0.305***	-0.475***	-0.311*	-0.368***	-0.383***	-0.066
	(-4.699)	(-2.840)	(-4.348)	(-4.158)	(-1.675)	(-5.951)	(-6.236)	(-0.274)
CASH_TA	0.965***	1.097***	1.084***	1.144***	1.509***	1.091***	1.143***	0.539
	(7.192)	(7.463)	(8.940)	(7.130)	(5.275)	(10.811)	(11.498)	(1.330)
SIGMA_ROA3	-0.138	-0.236***	-0.192**	-0.228**	-0.496**	-0.176***	-0.197***	-0.002
	(-1.227)	(-3.114)	(-2.491)	(-2.294)	(-2.169)	(-2.833)	(-3.185)	(-0.006)
DIFF_STR	-0.525	-1.040***	-1.997***	-0.193	2.682	-1.158***	-0.999***	0.943
	(-1.156)	(-2.766)	(-4.419)	(-0.398)	(1.231)	(-3.766)	(-3.034)	(0.888)
GDPGROWTH	0.004	0.022***	0.013***	0.022***	0.008	0.018***	0.019***	-0.013
	(0.517)	(6.920)	(3.967)	(4.521)	(0.600)	(6.461)	(6.694)	(-1.043)
GDPCAPITA	0.645**	0.742***	0.775***	0.969***	1.476***	0.774***	0.780***	0.772
	(2.326)	(5.946)	(6.152)	(6.121)	(3.373)	(7.851)	(7.894)	(0.892)
UNEMPLOYMENT	-0.013	0.014**	0.002	0.023***	0.047***	0.007	0.008*	0.036
	(-1.363)	(2.540)	(0.252)	(2.884)	(2.635)	(1.530)	(1.667)	(1.292)
Z-stats (P-value)	*0.156 (0.394)*		*1.269 (0.178)*		*0.107 (0.397)*		*-0.603 (0.333)*	
N	68,672	78,236	110,997	56,315	11,233	158,068	157,428	10,701
Adjusted R-Sq	0.0306	0.0533	0.0618	0.0666	0.0404	0.0671	0.0656	0.0439
Affiliate & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9 (cont'd) ─ Panel C: Additional Cross-Sectional Regression Results for Agency Costs (H3)
Dependent Variable: Gross Investment Ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High_WGI	Low_WGI	Close_Dist	Far_Dist	Same_NACE	Diff_NACE	Same_Lang	Diff_Lang
POST*USAFF$_{it}$	0.095	0.046	0.137**	0.053	0.136	0.090	0.074	0.217
	(1.340)	(0.547)	(1.978)	(0.603)	(1.153)	(1.523)	(1.342)	(1.076)
SIZE	-0.863***	-0.962***	-0.939***	-0.997***	-0.721***	-0.975***	-0.962***	-0.813***
	(-13.546)	(-14.591)	(-17.282)	(-12.677)	(-4.989)	(-21.179)	(-20.852)	(-5.135)
ROA	0.168	0.414***	0.427***	0.244**	0.336	0.370***	0.353***	0.662***
	(1.286)	(4.657)	(4.654)	(2.082)	(1.593)	(4.895)	(4.736)	(3.060)
OPER_MARGIN	-0.010	-0.011	-0.024*	-0.003	-0.056	-0.017	-0.014	-0.106**
	(-0.582)	(-0.828)	(-1.870)	(-0.112)	(-0.907)	(-1.600)	(-1.247)	(-1.985)
SALES_GROWTH	0.016	0.027**	0.012	0.036***	0.051	0.017**	0.020***	0.005
	(1.509)	(2.394)	(1.613)	(2.625)	(1.474)	(2.517)	(2.881)	(0.245)
LEVERAGE	-0.509***	-0.286**	-0.372***	-0.392**	-0.188	-0.407***	-0.419***	-0.006
	(-4.931)	(-2.451)	(-4.401)	(-2.383)	(-0.970)	(-5.181)	(-5.374)	(-0.019)
CASH_TA	1.136***	1.082***	1.068***	1.331***	1.802***	1.125***	1.197***	0.698
	(6.956)	(5.617)	(7.158)	(6.471)	(4.956)	(8.906)	(9.618)	(1.464)
SIGMA_ROA3	0.149	-0.296**	-0.001	-0.408***	-0.599**	-0.103	-0.141	0.026
	(0.819)	(-2.372)	(-0.010)	(-2.838)	(-2.238)	(-0.969)	(-1.342)	(0.070)
DIFF_STR	-0.841	-0.143	-0.892*	0.248	2.009	-0.350	-0.288	1.449
	(-1.565)	(-0.286)	(-1.840)	(0.390)	(0.728)	(-0.934)	(-0.713)	(1.214)
GDPGROWTH	-0.002	0.011***	0.005	0.015**	0.015	0.010**	0.010***	-0.012
	(-0.168)	(2.683)	(1.118)	(2.206)	(1.044)	(2.512)	(2.719)	(-0.876)
GDPCAPITA	0.732**	1.456***	1.078***	1.601***	1.979***	1.213***	1.165***	1.707
	(2.450)	(7.658)	(5.925)	(6.721)	(3.284)	(8.300)	(8.030)	(1.624)
UNEMPLOYMENT	-0.026**	0.022***	-0.001	0.025**	0.048***	0.009	0.006	0.078**
	(-2.301)	(3.048)	(-0.189)	(2.549)	(2.788)	(1.564)	(1.025)	(2.359)
Z-stats (P-value)	0.446 (0.361)		0.751 (0.301)		0.349 (0.375)		-0.683 (0.316)	
N	64,624	56,476	91,608	42,904	9,816	126,509	125,166	10,026
Adjusted R-Sq	0.0781	0.1480	0.1250	0.1190	0.1200	0.1250	0.126	0.0836
Affiliate &Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

CHAPTER 6: SUPPLEMENTAL ANALYSIS AND ROBUSTNESS TEST

6.1.   Timing of Firms' Response

Political developments during this period could potentially influence the likelihood of tax reform. Whereas the above predictions will hold as long as the perceived probability of a tax reform increases as a result of legislative actions, the outcomes of election cycles can also influence the expected likelihood of tax reform becoming law.

To better understand the timing of firm responses, I perform an additional analysis estimating the effect over time by including interaction terms between year dummies in the post period and the treatment indicator *USAFF*. I expect that the increases in foreign investment of U.S. MNCs are stronger (both in term of the statistical significance and the economic magnitude) in the more recent years.

$$INVESTMENT_{i,t} = \beta_1 + \sum_{j=2012}^{2016} \beta_{YEARj} * \textbf{USAFF}_{it} * I\left\{i \in YEAR_j\right\} + \beta_3 * SIZE_{i,t-1} +$$

$$\beta_4 * ROA_{i,t-1} + \beta_5 * OPERMARGIN_{i,t-1} + \beta_6 * SALESGROWTH_{i,t-1} + \beta_7 *$$

$$LEVERAGE_{i,t-1} + \beta_8 * CASH\_TA_{i,t-1} + \beta_9 * SIGMAROA3_{i,t} + \beta_9 * DIFF\_STR_{i,t} + \beta_z * \textbf{Z}_{kt} +$$

$$\alpha_i + \delta_t + \varepsilon_{it} \quad (2)$$

Table 10 presents the regression results for this test. The results indicate that the surge in investment by foreign affiliates of U.S. MNCs starts from the year 2015 onwards. When using *NET_INVT* as the dependent variable, the coefficients estimating the effect in 2015 and 2016 are 0.150 and 0.261, respectively, and are statistically significant at the 1% and 5% levels. When using *GROSS_INVT* as the dependent variable, the coefficient estimating the effect in 2016 is 0.181 and is statistically significant at the 5% level.

Table 10
Regression Results for Timing of Investment Response

Variables	(1) Net Investment Ratio	(2) Gross Investment Ratio
*Y2012*USAFF$_{it}$*	0.014	0.056
	(0.219)	(0.736)
*Y2013*USAFF$_{it}$*	0.031	0.020
	(0.529)	(0.285)
*Y2014*USAFF$_{it}$*	0.034	0.049
	(0.570)	(0.657)
*Y2015*USAFF$_{it}$*	**0.150****	0.111
	(2.292)	(1.400)
*Y2016*USAFF$_{it}$*	**0.261*****	**0.181****
	(3.431)	**(2.018)**
SIZE	-0.743***	-0.959***
	(-23.647)	(-21.867)
ROA	0.211***	0.373***
	(4.740)	(5.289)
OPER_MARGIN	-0.008	-0.019*
	(-1.407)	(-1.744)
SALES_GROWTH	0.022***	0.019***
	(4.827)	(2.885)
LEVERAGE	-0.371***	-0.398***
	(-6.319)	(-5.394)
CASH_TA	1.103***	1.156***
	(11.568)	(9.725)
SIGMA_ROA3	-0.198***	-0.142
	(-3.312)	(-1.429)
DIFF_STR	-1.218***	-0.465
	(-4.015)	(-1.195)
GDPCAPITA	0.018***	0.010***
	(6.538)	(2.634)
UNEMPLOYMENT	0.799***	1.245***
	(8.402)	(8.909)
GDPGROWTH	0.009**	0.010*
	(2.063)	(1.940)
N	171,101	137,948
Adjusted R-Sq	0.0654	0.1250
Affiliate & Year FE	Yes	Yes

Notes: This table presents the results of estimating the equation (2) with affiliate and year fixed effects. Column (1) presents the results using net fixed asset investment ratio as the dependent variable and Column (2) presents the results using gross fixed asset investment ratio as the dependent variable. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

The timing of changes in U.S. MNCs' foreign investment activities coincides with the year in which Rep. Dave Camp released the draft and introduced the Tax Reform Act of 2014 in the House. In the same year, the Republican Party gained control of both the House and Senate after the mid-term elections, making tax reform one of the most pressing priorities in both houses of Congress (e.g., Blake 2014; Rasmussen 2014). Following the mid-term election, the new chairmen of the House Ways and Means Committee, Paul Ryan and subsequently Kevin Brady, made tax reform one of their top priorities (Lawder 2015; Migdail 2016). The political developments in 2014 arguably increased the likelihood of corporate tax reform in the subsequent years.

To further support the assertion that the combination of legislative activities and the political developments in 2014 provides U.S. MNCs with more credible signals of future tax reform, I examine the stock returns of U.S. MNCs around the 2014 mid-term election. As shown in Table 11, the abnormal returns are significantly more positive for the subgroup of U.S. MNCs with high repatriation tax costs (and therefore the larger benefit from a repatriation tax reduction) than those with low repatriation tax costs. This finding is consistent using different return windows, which include three, five, or ten days before the election day.

Table 11

Table 11
Results of Market Reaction to the 2014 Midterm Elections

Mean Cumulative Abnormal Returns
Event Date: 4th November 2014

	CAR (-10, 1)	CAR (-5, 1)	CAR (-3, 1)
HIGH_REPAT (N=254)	0.0398	0.0220	0.0179
LOW_REPAT (N=252)	0.0113	0.0055	0.0070
Difference	0.0285	0.0165	0.0109
t-stats	*0.0000*	*0.0012*	*0.0077*

This table presents the stock market reactions to the 2014 U.S. Midterm Elections. The cumulative abnormal returns (CAR) are calculated using the market model. CARs for all 506 listed U.S. MNCs in the sample are positive and statistically significant. The sample is split by the median of the repatriation tax costs (*REPAT*) estimated as of 2013.

6.2.   Propensity Score Matching

As indicated by the descriptive statistics in Table 5, there are significant differences between the treatment group (i.e., the foreign subsidiaries of U.S. MNCs) and the control group (i.e., the subsidiaries of non-U.S. MNCs that are not subject to repatriation taxes). To ensure that these differences do not affect the results, I repeat the main analysis with a propensity-score matched sample of the treatment and the control groups.

First, I estimate the propensity for an affiliate to be owned by a U.S. MNC from a location choice model. The location choice is modeled as a function of affiliates' observable characteristics in the pre-treatment period (*SIZE, ROA, OPERMARGIN, CASH_TA, SALESGROWTH*, and *LEVERAGE*). These covariates are averaged for the pre-treatment years. I then match each U.S. MNC foreign subsidiary with the nearest neighbor from the control group based on the estimated propensity score. I further ensure that the matching exercise is done within the same host country. This matching approach has been adopted in prior studies of cross-border investment behavior (i.e., Shroff et al. 2013; Egger et al. 2015; Liu 2019).

Figure 4 illustrates the change in the standardized percentage of bias across covariates between the unmatched and matched sample. For most of the covariates, the standardized percentages of bias are significantly reduced.

As shown in Panel A of Table 12, the overall mean standardized percentage of bias reduces by 84.3% (from 13.4% to 2.1%) for the matched sample.

Figure 4 ─ Covariate Imbalance Before and After Matching
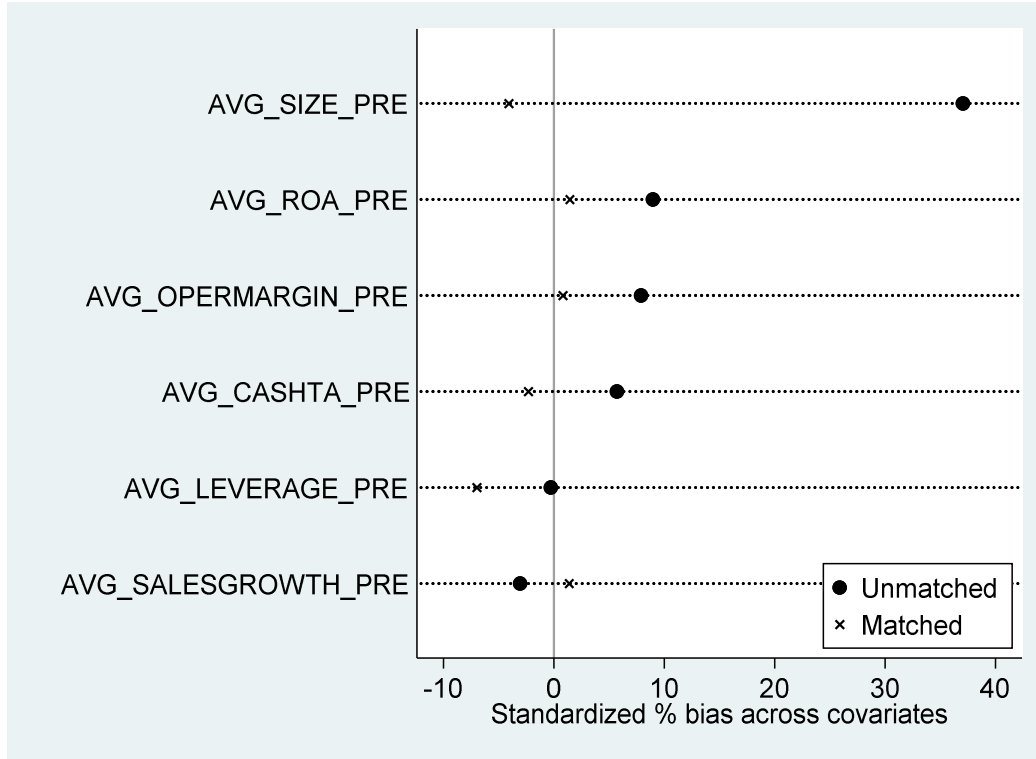
Panel B of Table 12 presents the results for the change in net and gross investment ratios of U.S. MNCs, and Panel C of Table 12 presents the result of the cross-sectional test based on the repatriation tax costs. Although the statistical significance of the main effect on investment slightly decreases, the overall inference is unchanged.

Table 12 ─ Robustness Analyses Using Matched Sample
Panel A: Covariate Imbalance Testing

	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	Rubins' B	Rubins' R
All covariates							
Unmatched	0.026	4625.45	0.000	13.4	6.8	49.8*	0.65
Matched	0.001	27.94	0.000	2.1	1.8	6.9	1.02
AVG_SIZE_PRE							
Unmatched	0.016	5825.46	0.000	37.10	37.10	37.1*	0.93
Matched	0.001	19.90	0.000	4.10	4.10	5.70	0.91
AVG_CASHTA_PRE							
Unmatched	0.000	99.86	0.000	5.70	5.70	5.70	1.05
Matched	0.000	6.70	0.010	2.30	2.30	3.10	1.82
AVG_ROA_PRE							
Unmatched	0.001	318.26	0.000	9.00	9.00	9.00	0.91
Matched	0.000	3.38	0.066	1.40	1.40	2.20	1.80
AVG_OPERMARGIN_PRE							
Unmatched	0.001	205.48	0.000	7.90	7.90	7.90	0.60
Matched	0.000	1.18	0.277	0.80	0.80	1.30	1.00
AVG_SALESGROWTH_PRE							
Unmatched	0.000	23.22	0.000	3.10	3.10	3.10	0.78
Matched	0.000	2.08	0.149	1.40	1.40	1.90	1.13
AVG_LEVERAGE_PRE							
Unmatched	0.000	0.29	0.589	0.30	0.30	0.30	1.15
Matched	0.002	56.27	0.000	7.00	7.00	9.20	1.12

Notes: This table reports the results of the covariate imbalance testing before and after the matching procedure. I match each U.S. MNCs' foreign subsidiary with the nearest neighbor subsidiary within the same host country from the control group based on the propensity score estimated from a location choice model. The location choice is modeled as the likelihood of an affiliate to be owned by a U.S. MNC based on its observable characteristics in the pre-treatment period. The comparisons are made for each of the covariate used to match the treatment to the control group and also for all of the covariates. Ps R2, LR chi2, and p>chi2 report the pseudo-R2, the P-value of the likelihood-ratio test, and the probability of the joint null hypothesis that all of the regression coefficients are zero from probit estimation of the propensity score on all covariates. MeanBias and MedBias are the mean and median bias of the distribution of the abs(bias) before and after matching. The standardized % bias is the % difference of the sample means in the treatment and control (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the treatment and control groups (Rosenbaum and Rubin, 1985). Rubins' B (the absolute standardized difference of the means of the linear index of the propensity score in the treated and (matched) non-treated group) and Rubin's R (the ratio of treated to (matched) non-treated variances of the propensity score index). Rubin (2001) recommends that B be less than 25 and that R be between 0.5 and 2 for the samples to be considered sufficiently balanced. An * is displayed next to B and R values that fall outside those limits.

Table 12 (cont'd)
Panel B: Regression Results for Fixed Asset Investment (H1)

Variables	Net Investment Ratio		Gross Investment Ratio	
	(1)	**(2)**	**(3)**	**(4)**
POST*USAFF$_{it}$	**0.118†**		**0.153***	
	(1.590)		**(1.816)**	
Y2012*USAFF$_{it}$		-0.046		-0.020
		(-0.408)		(-0.155)
Y2013*USAFF$_{it}$		0.100		0.136
		(0.976)		(1.181)
Y2014*USAFF$_{it}$		**0.198****		**0.276*****
		(2.257)		**(2.667)**
Y2015*USAFF$_{it}$		**0.245****		**0.272****
		(2.251)		**(2.196)**
Y2016*USAFF$_{it}$		**0.207***		**0.227†**
		(1.705)		**(1.621)**
SIZE	-0.713***	-0.716***	-0.778***	-0.787***
	(-7.013)	(-6.486)	(-5.834)	(-5.854)
ROA	0.068	0.195	0.249	0.254
	(0.391)	(0.899)	(1.034)	(1.059)
OPER_MARGIN	-0.003	-0.023	-0.029	-0.029
	(-0.103)	(-0.337)	(-0.343)	(-0.344)
SALES_GROWTH	0.036**	0.025	0.029	0.029
	(2.250)	(1.393)	(1.352)	(1.349)
LEVERAGE	-0.132	-0.276	-0.324	-0.322
	(-0.554)	(-1.266)	(-1.368)	(-1.357)
CASH_TA	1.195***	1.133***	1.241***	1.227***
	(3.942)	(3.544)	(3.416)	(3.372)
SIGMA_ROA3	-0.169	-0.383*	-0.307	-0.303
	(-0.782)	(-1.665)	(-1.193)	(-1.178)
DIFF_STR	-1.148	-0.015	-0.314	-0.099
	(-1.232)	(-0.015)	(-0.349)	(-0.085)
GDPGROWTH	0.026**	0.025	0.029*	0.029*
	(2.006)	(1.643)	(1.716)	(1.726)
GDPCAPITA	1.112***	1.678***	1.909***	1.947***
	(2.924)	(3.627)	(3.691)	(3.750)
UNEMPLOYMENT	0.006	0.018	0.020	0.022
	(0.363)	(1.142)	(1.091)	(1.142)
N	13,702	13,702	12,963	12,963
Adjusted R-Sq	0.0376	0.0446	0.0841	0.0843
Affiliate & Year FE	Yes	Yes	Yes	Yes

Notes: This table reports the results for the main effects using the matched sample. Column 1 & 2 (3 & 4) present results of estimating the equation (1) using the net investment ratio (gross investment ratio) as the dependent variable. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). (†) indicates significance on a one-tail test. t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

Table 12 (cont'd)
Panel C: Cross-Sectional Regression Results (H2 Repatriation Tax Costs)

Variables	Net Investment Ratio	Gross Investment Ratio
	(1)	(2)
ABOVEMED_REPAT*POST	**0.284****	**0.296****
	(2.511)	**(2.225)**
BELOWMED_REPAT*POST	**-0.008**	**-0.021**
	(-0.068)	**(-0.174)**
ABOVEMED_REPAT	-0.815	-0.372
	(-1.580)	(-1.217)
BELOWMED_REPAT	-0.751	-0.340
	(-1.487)	(-1.163)
SIZE	-0.866***	-0.912***
	(-6.039)	(-4.915)
ROA	-0.234	0.016
	(-0.741)	(0.045)
OPER_MARGIN	0.041	0.048
	(0.768)	(0.504)
SALES_GROWTH	0.022	0.026
	(1.326)	(1.183)
LEVERAGE	-0.144	-0.246
	(-0.510)	(-0.774)
CASH_TA	1.397***	1.573***
	(3.460)	(3.303)
SIGMA_ROA3	-0.456	-0.341
	(-1.571)	(-0.991)
DIFF_STR	-0.130	-0.175
	(-0.123)	(-0.136)
GDPGROWTH	0.016	0.016
	(0.833)	(0.675)
GDPCAPITA	1.297**	1.917***
	(2.414)	(2.650)
UNEMPLOYMENT	0.008	0.018
	(0.393)	(0.780)
Coeff Difference (p-value)	*0.2918 (0.025)*	*0.3172 (0.038)*
N	9,470	9,244
Adjusted R-Sq	0.0512	0.0982
Affiliate & Year FE	Yes	Yes

Notes: This table presents the results of the cross-sectional test based on repatriation tax costs (*REPAT*) for the matched sample. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t -statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

6.3.   Alternative Benchmark Period

In the main analyses, I exclude all observations between 2007 and 2009 to avoid any confounding effects of the 2008 financial crisis on investment behavior of foreign affiliates, especially those owned by U.S. MNCs. The results are qualitatively similar when including the observations from the period 2007-2009, and for some of the tests, the statistical significance of the main coefficients increases. The results of this additional analysis are presented in Table 13.

Table 13 ─ Results Using Alternative Benchmark Period (2007-2011)
Panel A: Regression Results for Fixed Asset Investment (H1)

Variables	Net Investment Ratio		Gross Investment Ratio	
	(1)	(2)	(3)	(4)
*POST*USAFF*$_{it}$	0.124***		0.091*	
	(3.084)		(1.813)	
*Y2012*USAFF*$_{it}$		0.031		0.054
		(0.514)		(0.725)
*Y2013*USAFF*$_{it}$		0.046		0.012
		(0.827)		(0.180)
*Y2014*USAFF*$_{it}$		0.058		0.046
		(1.040)		(0.645)
*Y2015*USAFF*$_{it}$		**0.164***		0.099
		(2.631)		(1.279)
*Y2016*USAFF*$_{it}$		**0.275***		**0.170***
		(3.722)		**(1.917)**
SIZE	-0.691***	-0.691***	-0.893***	-0.892***
	(-25.434)	(-25.439)	(-23.469)	(-23.460)
ROA	0.211***	0.211***	0.332***	0.331***
	(5.226)	(5.226)	(5.443)	(5.436)
OPER_MARGIN	-0.007	-0.007	-0.015	-0.015
	(-1.384)	(-1.388)	(-1.607)	(-1.606)
SALES_GROWTH	0.022***	0.022***	0.019***	0.018***
	(5.442)	(5.429)	(3.214)	(3.204)
LEVERAGE	-0.376***	-0.375***	-0.419***	-0.419***
	(-7.260)	(-7.245)	(-6.454)	(-6.461)
CASH_TA	1.094***	1.093***	1.194***	1.194***
	(12.893)	(12.885)	(11.218)	(11.222)
SIGMA_ROA3	-0.169***	-0.168***	-0.104	-0.104
	(-3.006)	(-3.000)	(-1.159)	(-1.157)
DIFF_STR	-1.203***	-1.484***	-0.347	-0.651*
	(-4.374)	(-5.450)	(-1.007)	(-1.862)
GDPGROWTH	0.010***	0.010***	0.003	0.003
	(4.278)	(4.237)	(1.089)	(1.049)
GDPCAPITA	0.714***	0.702***	0.995***	0.991***
	(8.506)	(8.378)	(8.139)	(8.122)
UNEMPLOYMENT	0.013***	0.012***	0.009*	0.008*
	(3.431)	(3.264)	(1.933)	(1.832)
N	199,518	199,518	164,718	164,718
Adjusted R-Sq	0.0674	0.0676	0.1260	0.1260
Affiliate & Year FE	Yes	Yes	Yes	Yes

Notes: This table presents the results of estimating the equation (1) and (2) using the alternative benchmark period of 2007-2011. Column 1 & 2 (3&4) present the results using net (gross) fixed asset investment ratio as the dependent variable. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

Table 13 (cont'd)
Panel B: Cross-Sectional Regression Results (H2 Repatriation Tax Costs)

Variables	Net Investment Ratio	Gross Investment Ratio
	(1)	(2)
ABOVEMED_REPAT*POST	**0.198****	**0.147**
	(2.553)	**(1.446)**
BELOWMED_REPAT*POST	**-0.072**	**-0.127**
	(-0.872)	**(-1.336)**
ABOVEMED_REPAT	-0.030	0.125
	(-0.085)	(0.441)
BELOWMED_REPAT	0.125	0.235
	(0.359)	(0.844)
SIZE	-0.695***	-0.898***
	(-24.805)	(-22.860)
ROA	0.210***	0.323***
	(5.017)	(5.151)
OPER_MARGIN	-0.006	-0.013
	(-1.153)	(-1.389)
SALES_GROWTH	0.021***	0.018***
	(5.124)	(3.081)
LEVERAGE	-0.383***	-0.428***
	(-7.291)	(-6.427)
CASH_TA	1.103***	1.205***
	(12.586)	(11.040)
SIGMA_ROA3	-0.187***	-0.120
	(-3.243)	(-1.294)
DIFF_STR	-1.553***	-0.797**
	(-5.628)	(-2.258)
GDPGROWTH	0.009***	0.002
	(3.925)	(0.625)
GDPCAPITA	0.721***	1.002***
	(8.396)	(7.996)
UNEMPLOYMENT	0.013***	0.009*
	(3.516)	(1.941)
Coeff Difference (p-value)	***0.2695 (0.015)***	***0.2743 (0.051)***
N	191,595	158,257
Adjusted R-Sq	0.0691	0.127
Affiliate & Year FE	Yes	Yes

Notes: This table presents the results of the cross-sectional test based on repatriation tax costs (*REPAT*) for the matched sample. Complete variable definitions are provided in Appendix B. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t -statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

6.4.   Additional Macroeconomic Controls

In the main analyses, I include macroeconomic controls related to the host country's productivity factor, growth, and workforce. The results are qualitatively similar when I control for the parent country's macroeconomic factors or differences between the parent country's macroeconomic factors and those of the host country. Furthermore, I also obtain consistent results with the inclusion of affiliate-country_year fixed effects.

6.5.   Foreign Cash Holdings

Although the examination of foreign cash holdings is not the focus of my study, economic theory also predicts that the anticipation of a reduction in future repatriation taxes should also provide incentives for U.S. MNCs to delay repatriations, and hence accumulate more foreign cash (Korinek and Stiglitz 2009; Albertus et al. 2019). To test this prediction, I adopt a model similar to that in De Simone et al. (2018) and estimate the change in the cash holding ratios of U.S. MNCs' foreign subsidiaries from a period of lower- to higher- expectation. Again, the control group in the sample includes the foreign affiliates of non-U.S. MNCs that are not subject to repatriation taxes. The dependent variables are the affiliates' cash to total assets ratio (*CASH_TA*) and the affiliates' cash to net assets ratio (*CASH_NETTA*).

Following Bates, Kahle, and Stulz (2009), I control for factors that have been shown to influence subsidiaries' cash holdings. These factors include firm size (*SIZE*), short-term liquidity (*NETWORKINGCAPITAL*), profitability (*ROA*), capital expenditure (*NET_INVT*), financial leverage (*LEVERAGE*), the ratio of cash flows generated by the subsidiaries' assets (*CASHFLOWASSET*), and operational risk (*SIGMAROA3*). The variable definitions are provided in Appendix B. Similar to the test of fixed asset investments, I also control for the difference in the statutory corporate tax rates (*Diff_STR*) and time-varying macroeconomic factors (GDP

growth – *GDPGROWTH*, GDP per capita – *GDPCAPITA*, and Unemployment rates –

UNEMPLOYMENT).

The results are presented in Table 14. In line with the theoretical prediction, I find a significant increase in the cash holdings among the U.S. MNCs' affiliates in the higher-expectation period, and specifically, from 2014 onwards. In columns (1) and (3), the coefficients on the interaction term, *USAFF*POST*, are both positive (0.007 or *CASH_NETTA* and 0.031 for *CASH_TA*) and statistically significant at the 1% and 10% levels. The coefficients that capture the effects in 2014, 2015, and 2016 are substantially larger than those in the lower-expectation period and are statistically significant. These results are consistent with U.S. firms strategically delaying repatriation of foreign earnings to repatriate at a lower tax cost in the future. The evidence of foreign cash holdings response to anticipated changes in future repatriation tax costs is also consistent with findings in concurrent research (i.e., De Simone et al. 2018).

Table 14 ─ Additional Analyses for Foreign Cash Holdings

Variables	CASH_NETTA	CASH_NETTA	CASH_TA	CASH_TA
	(1)	(2)	(3)	(4)
*POST*USAFF_{it}*	**0.007***		**0.031***	
	(3.409)		**(1.770)**	
*Y2012*USAFF_{it}*		-0.007		-0.058
		(-0.917)		(-0.885)
*Y2013*USAFF_{it}*		0.005		-0.006
		(1.590)		(-0.249)
*Y2014*USAFF_{it}*		**0.006****		-0.011
		(1.971)		(-0.452)
*Y2015*USAFF_{it}*		**0.008***		**0.054****
		(2.639)		**(2.150)**
*Y2016*USAFF_{it}*		**0.009***		**0.072***
		(2.701)		**(2.822)**
SIZE	-0.017***	-0.017***	-0.084***	-0.085***
	(-22.805)	(-22.849)	(-14.079)	(-14.148)
NETWORKINGCAPITAL	0.016***	0.016***	0.111***	0.111***
	(22.541)	(22.526)	(18.864)	(18.832)
ROA	0.011***	0.011***	0.056***	0.056***
	(8.381)	(8.391)	(5.149)	(5.170)
NETINVESTMENT	-0.003***	-0.003***	-0.017***	-0.017***
	(-20.077)	(-20.093)	(-14.423)	(-14.450)
LEVERAGE	-0.016***	-0.016***	-0.121***	-0.121***
	(-6.747)	(-6.737)	(-6.217)	(-6.206)
LAGCASHFLOW	0.011***	0.011***	0.021	0.021
	(6.867)	(6.884)	(1.585)	(1.618)
SIGMA_ROA3	0.054***	0.054***	0.329***	0.329***
	(22.486)	(22.492)	(17.023)	(17.029)
DIFF_STR	-0.000***	-0.000***	-0.004***	-0.004***
	(-3.133)	(-3.080)	(-3.430)	(-3.388)
GDPGROWTH	-0.014***	-0.014***	-0.144***	-0.151***
	(-2.908)	(-2.992)	(-3.776)	(-3.957)
GDPCAPITA	-0.000	-0.000	-0.005***	-0.005***
	(-0.945)	(-0.967)	(-2.604)	(-2.643)
UNEMPLOYMENT	-0.017***	-0.017***	-0.084***	-0.085***
	(-22.805)	(-22.849)	(-14.079)	(-14.148)
N	147,229	147,229	147,205	147,205
Adjusted R-Sq	0.722	0.722	0.545	0.545
Affiliate & Year FE	Yes	Yes	Yes	Yes

Notes: The table presents the results of estimating the change in foreign cash ratios at the affiliate level following Bates et al.'s model (2009). Column (1) & (3) estimate the change in cash ratios of U.S. subsidiaries from a period of lower- to a period higher- expectation compared to the control group. Column (2) & (4) estimate the effects over time. ***, **, * indicate that the regression coefficient is significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed). t-statistics are presented in parentheses below the regression coefficients. Robust standard errors were computed using Huber-White corrections with clustering at the affiliate-level.

CHAPTER 7: CONCLUDING REMARKS

In this study, I extend prior research on the economic consequences of repatriation taxes by investigating how the anticipation of a future decrease in repatriation tax costs affected U.S. MNCs' foreign investment activities. I make use of the period leading up to the passage of the TCJA as a setting to empirically examine this question. Legislative actions after 2011 to move U.S. corporate tax reform forward arguably changed firms' expectations regarding future repatriation tax costs. During this period, I find that foreign subsidiaries of U.S. MNCs made significantly more capital investments compared to the subsidiaries of non-U.S. MNCs operating in the same country. The increase in foreign capital investment is concentrated among U.S. MNCs' subsidiaries whose parents face higher repatriation tax costs, and hence would benefit more from territorial tax reform. The results suggest that the expectation of lower repatriation tax costs, as part of a potential territorial tax reform, unintentionally altered the firm's cost of capital and prompted a significant increase in capital investment overseas.

The results from additional cross-sectional tests based on agency costs (between the parent entity of the U.S. MNC and the subsidiary) provide some validation that the documented effect differs from the type of agency-driven investment behavior observed in prior research. Inconsistent with agency-driven behavior, the difference between foreign subsidiaries that are subject to high and low monitoring by the parent entities is not statistically significant across most of the proxies used.

There are several caveats and limitations to this study. First, I rely on tax reform legislative developments to identify the change in firms' expectations regarding U.S territorial tax reform. This approach assumes that such events materially altered managers' belief about the expected repatriation tax costs. Therefore, in the first set of cross-sectional tests, I examine how

the behavior of U.S. MNCs varies with their incentives to capitalize on the proposed tax reform to further attribute the documented effects to anticipated tax reform. Second, even though the use of affiliate-level data allows for a rigorous empirical design by comparing U.S. MNCs' foreign subsidiaries with subsidiaries of non-U.S. MNCs operating in the same country, the coverage of the Orbis database is limited to foreign operations that are required to disclose their financial statements. Therefore, capital investment activities outside of the group of reporting subsidiaries are not captured in the tests. Third, the examination of cross-border investment patterns always faces the challenge of controlling for the influence of all firm-level and country-level factors. To mitigate this concern in this study, I followed the approach set out in prior studies and utilized an extensive list of controls and fixed effects.

To conclude, this study provides evidence that the expectation of U.S. territorial tax reform has inadvertently incentivized U.S. MNCs to increase their foreign investment activities. One implication of these findings is that reform expectations brought about unintended consequences for the real economy during the pre-TCJA period. This finding, therefore, has potential implications for future studies that seek to examine the consequences of the TCJA.

APPENDICES

APPENDIX A

A SIMPLE MODEL FOR THE ANTICIPATED EFFECTS OF U.S. TAX REFORM

The multi-year model below illustrates the effect of the anticipated changes in the repatriation tax costs on business investments. The setup follows a neoclassical model based on Hartman (1985), Bond, Devereux, and Klemm (2007), De Waegenaere and Sansing (2008), and Chetty and Saez (2010). The model incorporates the basic assumptions in De Waegenaere and Sansing (2008) and allows for the investment of unrepatriated earnings in financial assets.

A U.S. incorporated firm owns a subsidiary incorporated in a foreign country. Assume that at period 0, a foreign subsidiary of a U.S. MNC has a cash holding of X. These cash holdings represent unrepatriated earnings from past operations. The firm's manager can choose to (1) invest the cash in operating assets (I), (2) invest the cash in financial assets (C), and (3) repatriate the residual cash (if any) as dividends (D).

Investments in operating assets are expected to generate risky pre-tax returns of $f(I)=AI^\alpha$ in year T, where $0 < \alpha < 1$, and productivity parameter A is assumed to be deterministic. The firm production function $f(.)$ is assumed to be strictly concave, strictly increasing, continuous, and differentiable. Investment I can be financed by either retained earnings or by new equity capital (E) from the parent company. At time T, the foreign subsidiary returns the entire wealth to the U.S. parent entity by paying out a dividend. The foreign subsidiary's profit is subject to two types of taxes: corporate tax rate at the local country τ_F and U.S. repatriation tax upon the distribution of such profit to the U.S. parent. In general, the additional repatriation tax is the difference between the tax liability of foreign earnings under U.S. domestic tax rates and income taxes previously paid in the foreign jurisdiction.

Let's denote the rate at which repatriated earnings will be taxed, τ_R. Using the discount rate of ρ to discount the after-tax risky returns, the present value of after-tax distributions from the investment in operating assets can be calculated as:

$$V_I = \frac{(1-\tau_R)}{(1-\tau_F)} \frac{[(1-\tau_F)f(I)+I-E]+E}{(1+\rho)^T} \qquad (1)$$

Investment in financial assets is expected to generate a pre-tax non-negative riskless return of r ($r < \rho$). As shown in De Waegenaere and Sansing (2008), the average shareholder tax rate on interest (τ_s) is the appropriate rate to discount riskless cash flows from investments in financial assets. Therefore, the discount rate for the after-tax riskless returns is $r(1-\tau_s)$. Prior to tax reform, the returns on financial assets are taxed immediately at the U.S. domestic tax rate of τ_{US}. The distribution of the original investment in financial assets is also subject to U.S. repatriation tax as

described above. The present value of after-tax distributions from the investment in financial assets can be calculated as:

$$V_{FA} = \frac{(1 - \tau_{US})C[(1 + r)^T - 1]}{[1 + r(1 - \tau_s)]^T} + \frac{(1 - \tau_R)}{(1 - \tau_F)} \frac{C}{[1 + r(1 - \tau_s)]^T} \tag{2}$$

Finally, the subsidiary can also choose to repatriate the residual foreign earnings to the U.S. parent as dividends (D) at time 0. The dividend, if any, is the difference between the net after-tax cumulative earnings at time 0 (X) plus any additional new capital equity from the parent (E) less the amounts invested in operating assets (I) and financial assets (C). In other words, $D = X(1 - \tau_F) + E - I - C$. The net distributions after accounting for U.S. repatriation tax is:

$$V_D = \frac{(1 - \tau_{US})}{(1 - \tau_F)} D = \frac{(1 - \tau_{US})}{(1 - \tau_F)} [(1 - \tau_F)X + E - I - C] \tag{3}$$

At time 0, the foreign subsidiary chooses $I, E, C,$ and D to maximize the present value of net distributions to the parent company, which is given by:

$$\max V = V_D - E + V_I + V_{FA}$$

$$= \frac{(1 - \tau_{US})}{(1 - \tau_F)} D - E + \frac{(1 - \tau_R)}{(1 - \tau_F)} \frac{[(1 - \tau_F)f(I) + I - E] + E}{(1 + \rho)^T} + \frac{(1 - \tau_{US})C[(1 + r)^T - 1]}{[1 + r(1 - \tau_s)]^T}$$

$$+ \frac{(1 - \tau_R)}{(1 - \tau_F)} \frac{C}{(1 + r(1 - \tau_s))^T} \tag{4}$$

$s.t.: I \geq 0; D \geq 0; E \geq 0; C \geq 0; D = X(1 - \tau_F) + E - I - C$

Solving the first-order condition for the firm's optimal investment level yields the following:

$$I^* = \frac{(1 - \tau_F)(1 - \tau_R)(1 + \hat{r}_s)A\alpha}{[(1 - \tau_{US})(1 + \rho)^T - (1 - \tau_R)](1 + \hat{r}_s) + [\hat{r}(1 - \tau_{US})(1 - \tau_F) + (1 - \tau_R)](1 + \rho)^T} \tag{5}$$

with $\hat{r}_s = [1 + r(1 - \tau_s)]^T - 1$ and $\hat{r} = (1 + r)^T - 1$.

Assuming that firms do not expect any changes in repatriation tax between period 0 and T (i.e., $\tau_R = \tau_{US}$), the first-order condition for the firm's optimal investment becomes:

$$I^*_{No\ Reform\ Exp.} = \frac{(1 - \tau_F)(1 + \hat{r}_s)A\alpha}{[(1 + \rho)^T - 1](1 + \hat{r}_s) + [\hat{r}(1 - \tau_F) + 1](1 + \rho)^T} \tag{6}$$

When there is a change in the firm's expectation regarding the repatriation tax costs in period T (i.e., $E(\tau_R) = \tau_R^T < \tau_{US}$), the firm's optimal investment become:

$I^*_{With\ Reform\ Exp.}$

$$= \frac{(1 - \tau_F)(1 - \tau_R^T)(1 + \hat{r}_s)A\alpha}{[(1 - \tau_{US})(1 + \rho)^T - (1 - \tau_R)](1 + \hat{r}_s) + [\hat{r}(1 - \tau_{US})(1 - \tau_F) + (1 - \tau_R^T)](1 + \rho)^T} \quad (7)$$

Dividing both the denominator and nominator of Eq (5) by $(1 - \tau_R)$, $I^*_{With\ Reform\ Exp.}$ can be rewritten as the following:

$$\frac{(1 - \tau_F)(1 + \hat{r}_s)A\alpha}{\left[\frac{(1 - \tau_{US})}{(1 - \tau_R^T)}(1 + \rho)^T - 1\right](1 + \hat{r}_s) + \left[\hat{r}\frac{(1 - \tau_{US})}{(1 - \tau_R^T)}(1 - \tau_F) + 1\right](1 + \rho)^T} \quad (7a)$$

Because $\tau_R^T < \tau_{US}$, the expression $\frac{(1 - \tau_{US})}{(1 - \tau_R^T)}$ is always non-negative and less than 1, the denominator of Eq (7a) is always a smaller value than the denominator of Eq (6). Therefore, the optimal investment level in the case of tax reform expectation is always higher than the optimal investment level in the case without. In other words, an expectation of a lower repatriation tax in year T would reduce the marginal cost of investment in period 0, leading to an increase in the optimal level of investments for the foreign subsidiary ($I^*_{With\ Reform\ Exp.} > I^*_{No\ Reform\ Exp.}$). The above conclusion is consistent with firm's optimal behavior.

APPENDIX B

VARIABLE DEFINITIONS

Variable	Definitions
NET_INVT	Net change in total fixed assets from year *t-1* to *t* relative to prior year's total fixed assets (subsidiary-year level).
GROSS_INVT	The change in total fixed assets from year *t-1* to *t* adjusted for annual depreciation relative to prior year's total fixed assets (subsidiary-year level).
CASH_TA	Cash and cash equivalents scaled by year-end total assets (subsidiary-year level).
CASH_NETTA	Cash and cash equivalents scaled by year-end total net assets (subsidiary-year level).
REPAT	Subtract total foreign income tax expense from the product of a firm's foreign pre-tax income and the U.S. statutory tax rates. The maximum of this difference or zero is then scaled by total firm assets (U.S. MNC-year level).
SIZE	Log of the affiliate total asset at the beginning of the year (subsidiary-year level).
ROA	The ratio of profit and loss before tax and the affiliate's total asset (subsidiary-year level).
OPERMARGIN	The ratio of EBIT (earnings before interest and taxes) and the affiliate's total sales (subsidiary-year level).
SALESGROWTH	The fraction of the change in total sales from *t-1* to *t* (subsidiary-year level).
LEVERAGE	The ratio between the affiliate's total long-term debt and total assets (subsidiary-year level).
CASHFLOW	The ratio between the affiliate cash flow and total assets (subsidiary-year level).
SIGMA_ROA3	The volatility of the affiliates' ROA from *t-2* to *t* (subsidiary-year level).
NETWORKINGCAPITAL	The ratio of subsidiaries' net working capital to total assets (subsidiary-year level).
DIFF_STR	The difference in the corporate statutory income tax rate of the country where parent is located and the country where the affiliate is located.
GDPCAPITA	The log of annual gross domestic product per capita of the host-country from the World Bank
UNEMPLOYMENT	The rate of unemployment of the host-country from the World Bank (in percentage)
GDPGROWTH	The rate of GDP growth of the host-country from the World Bank (in percentage)

Variable Definitions (continued)

ABOVEMED_REPAT	An indicator variable that equals 1 if *REPAT* for affiliate *i* in year *t-1* is greater than the median repatriation tax cost for the sample of U.S. MNCs' foreign affiliates, and 0 otherwise.
BELOWMED_REPAT	An indicator variable that equals 1 if *REPAT* for affiliate *i* in year *t-1* is less than the median repatriation tax cost for the sample of U.S. MNCs' foreign affiliates, and 0 otherwise.
Fully_Owned	An indicator variable that equals 1 if affiliate *i* is 100% owned by the parent entity, and 0 otherwise.
Part_Owned	An indicator variable that equals 1 if affiliate *i* is less than 100% owned by the parent entity, and 0 otherwise.
Far_Dist	An indicator variable that equals 1 if the geographic distance between the parent's and subsidiary's countries is less than the median value of the sample affiliates, and 0 otherwise. The distance variable is demeaned by the parent entity's country. Data on the geographical distance is obtained from the CEPII database at http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp.
Close_Dist	An indicator variable that equals 1 if the geographic distance between the parent's and subsidiary's countries is less than the median value of the sample affiliates, and 0 otherwise. The distances are demeaned by the parent entity's country.
Diff_NACE	An indicator variable that equals 1 if the parent and affiliate do not share the same *NACE* industry 1-digit code, and 0 otherwise.
Same_NACE	An indicator variable that equals 1 if the parent and affiliate share the same *NACE* industry code 1-digit code, and 0 otherwise.
Low_WGI	An indicator variable that equals 1 if affiliate *i* locates in countries with a total corporate governance indicator score less than the median score of the sample affiliates, and 0 otherwise. Data on the countries' corporate governance indicators is obtained from the World Bank.
High_WGI	An indicator variable that equals 1 if affiliate *i* locates in countries with a total corporate governance indicator score greater than the median score of the sample affiliates, and 0 otherwise.
Diff_Lang	An indicator variable that equals 1 if the parent and affiliate do not share the same official language, and 0 otherwise. Data on the countries' official language is obtained from the CEPII database at http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp.
Same_Lang	An indicator variable that equals 1 if the parent and affiliate share the same official language, and 0 otherwise.

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