Foreign Cash Holdings and the Agency Costs of Debt

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ABSTRACT: We examine the relation between foreign cash holdings and the agency costs of debt. We posit and provide evidence of a positive association. Next, we investigate how recent tax legislation affects this relation. We find a significant decline in the positive relation between foreign cash holdings and the agency costs of debt following the Tax Increase and Prevention Act of 2005 (TIPRA) and the Tax Cuts and Jobs Act of 2017 (TCJA). We conclude that foreign cash holdings increase the agency costs of debt more than domestic cash holdings and that some actions by lawmakers have resulted in the attenuation of these costs. Our paper adds to the literature investigating the consequences of multinational companies' foreign cash balances and provides insights on the benefits of recent legislative action on providing a more competitive balance to U.S. multinational companies.

Keywords: Foreign cash holdings; agency cost of debt; credit ratings; Tax Increase and Prevention Act; Tax Cuts and Jobs Act

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INTRODUCTION

As U.S. firms have become more globalized, they continue to report more assets outside of the U.S. Numerous studies examine the economic consequences of these overseas assets, particularly firms' foreign cash holdings. While prior research generally concludes that agency costs increase in foreign cash holdings due to tax-related constraints (Chen, 2015; Harford, Wang, & Zhang, 2017), the literature primarily focuses on manager-shareholder agency costs with a limited focus on agency costs of debt. Additionally, the Tax Increase Prevention and Reconciliation Act of 2005 (TIPRA) and the Tax Cuts of Jobs Act of 2017 (TJCA) contain specific provisions aimed at lowering the competitive imbalance between U.S. multinationals and their non-U.S. competitors. This tax legislation may have positive externalities related to the agency costs of foreign cash holdings. This study examines how the tax constraints associated with foreign cash influence agency costs of debt by studying changes in the relation between foreign cash and credit ratings in response to recent U.S. legislation.

External stakeholders often assign a value of less than one for a dollar of corporate cash holdings in part due to agency costs (Pinkowitz, Stulz, & Williamson, 2006; Faulkender & Wang, 2006; Drobetz, Grüninger, & Hirschvogl, 2010). Specifically, prior literature shows that as total cash holdings increase, the risk of misappropriation increases via the free-cash-flow problem (Jensen, 1986; Faulkender & Wang, 2006). Tax-induced foreign cash holdings exacerbate manager-shareholder agency costs as firms face direct tax costs to move funds between jurisdictions. Repatriation taxes create these frictions that lead to a misalignment of cash holdings with positive net present value projects (Amberger, Markle, & Samuel, 2021; Edwards, Kravet, & Wilson, 2016; Hanlon, Lester, & Verdi, 2015). The decrease in investment efficiency and transparency thereby lowers the marginal value of foreign cash holdings relative to domestic cash holdings (Harford et al., 2017).

Like the manager-shareholder agency costs demonstrated by Hanlon et al. (2015) and Harford et al. (2017), tax-related increases in foreign cash holdings due to taxes likely increase agency costs of debt as reductions in investment efficiency and transparency from foreign cash increase risk. Moreover,

debtholders face potentially higher agency costs of debt as foreign cash increases because debt holders accrue little benefit from firms' risky foreign and domestic investments but still bear downside risk in the event of poor firm performance (Hasan, Hoi, Wu, & Zhang, 2014; Liu & Hsueh 1993; Myers, 1977; Myers & Majluf, 1984; Jensen & Meckling, 1976). Since equity holders, not debt holders, are the residual claimants, to the extent that foreign investments are riskier than domestic investments (Desai, Foley, & Hines, 2011), the benefits of the additional risk accrue to equity holders, not debt holders. Thus, our first hypothesis predicts that foreign cash holdings are more positively associated with agency costs of debt than domestic cash holdings.

While seemingly intuitive, our prediction is not without tension. Debt payments lack the discretion of dividend payments, which may diminish the effect of inefficient investment on debtholders relative to stockholders.[1] Moreover, while the repatriation tax liability associated with foreign cash reduces the ability to use these assets to service domestic debt, it has a less direct effect on investment returns to debtholders unless the tax liability increases the probability of default. Lastly, foreign cash holdings may reflect a firm's international presence that could lower its risk in the eyes of the debtholders (Reeb, Mansi, & Allee 2001; Mansi & Reeb 2002). Thus, whether foreign cash holdings have a more adverse effect on the agency cost of debt than domestic cash is an empirical research question.

Our next two hypotheses examine the effects of recent tax reforms that potentially reduce the agency costs of debt related to foreign cash holdings. Before TIPRA, the tax law generally treated the movement of funds between foreign subsidiaries as though the firm repatriated the funds to the U.S. and then redeployed them into the new jurisdiction. In an extreme situation where the originating subsidiary has a 0% corporate tax rate, the receiving subsidiary would effectively receive a net of only 65% of the

[1] Not all firms disclose the location of their cash holdings. Thus, in addition to a positive or negative association between foreign cash holdings and the cost of debt, it is also possible that debtholders simply do not consider foreign cash holdings when pricing debt. Additionally, while cash holdings are liquid assets and better able to service debt than capital assets (Acharya, Davydenko, & Strebulaev, 2012), the assets also carry a risk that they will not be there when it comes time to make a debt payment (Almeida, Campello, & Weisbach, 2004; Acharya, Almeida, & Campello, 2007). While we state our hypothesis in the alternative form, we also highlight these additional avenues that may mitigate that expected result.

gross amount of cash as the other 35% would be paid in taxes to the U.S. taxing authority. In 2005, TIPRA removed the immediate income tax burden for moving cash from one overseas subsidiary to another, thereby allowing deferral of this liability until brought back to the U.S. In 2017, TCJA eliminated the U.S. tax on repatriations, removing future tax constraints on the movement of funds between foreign subsidiaries and the U.S.[2] Thus, we expect the agency costs of debt associated with foreign cash to decrease relative to domestic cash holdings following TIPRA (our second hypothesis) and TCJA (our third hypothesis).

To test our research question, we proxy for the agency costs of debt using firm-year yield spreads (Jiang 2008). Despite many firms having foreign cash holdings, there is no requirement for firms to disclose these assets explicitly in their financial statements. Thus, we proxy for foreign cash holdings following Campbell, Dhaliwal, Krull, and Schwab (2023). This study specifically uses publicly available data from financial statements to estimate firms' cash holdings by country. We interact this measure with indicator variables representing post-TIPRA and post-TCJA to allow us to examine the relation between foreign cash holdings and the cost of debt and how this relation evolves following the enactment of tax legislation that potentially alters these agency costs.

We perform our analysis using a sample of 11,956 firm-year observations from 1993 to 2019. We find evidence consistent with our first hypothesis by finding a positive association between yield spread and foreign cash holdings. Consistent with our second and third hypotheses, we find a significant decrease in the primary effect following TIPRA and TCJA, respectively. In terms of economic significance, we find that, pre-TIPRA, a one-standard deviation increase in a firm's foreign cash holdings is associated with an increase in its cost of debt of 23.8 basis points. However, following TIPRA, this same increase is associated with an increase of only 2.0 basis points. This result implies that TIPRA eliminated 97.1% of the cost of debt penalty associated with foreign cash holdings. In contrast, relative to the pre-TIPRA time period, TCJA eliminated only 56.5% of the cost of debt penalty associated with foreign cash holdings.

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[2] Also, as part of the TCJA, U.S. firms were required to pay a one-time deemed repatriation tax on all unrepatriated foreign earnings. We do not expect this to affect our results because the TCJA was passed quickly from its initial announcement and the deemed repartition was immediately effective.

To help support our findings, we examine firms' tax haven cash holdings. Following our theory that foreign cash holdings should have higher shareholder-debtholder agency costs due to the tax and information frictions, one would expect that tax haven cash holdings have even more frictions, resulting in even higher shareholder-debtholder agency costs than non-tax haven cash holdings. We find consistent evidence across all three tests. In particular, the agency costs of debt are significantly higher for tax haven cash holdings relative to non-tax haven cash holdings, and the agency costs decline even more following TIPRA and TCJA. Our results collectively suggest that foreign cash holdings are associated with increased agency costs of debt relative to domestic cash; TIPRA and TCJA significantly reduced these costs.

In additional analysis, we find that the decline in the relation between credit ratings and foreign cash holdings after TIPRA and TCJA is more significant among firms with significant global disaggregation, proxied using the number of countries in which the firm has material subsidiaries. Using a cross-sectional test helps attribute the change in behavior to a specific provision (Auerbach & Slemrod, 1997). We also find our results are concentrated among observations with more R&D. This result runs consistent with De Simone, Huang, and Krull (2020) who document that intangible assets can facilitate multinational tax planning activities. These results support our main findings because these firms would most benefit from the deferral of income tax liability afforded under TIPRA and TCJA. Our findings are also robust to alternative samples and ensuring our firms have observations across multiple regimes.

Our paper adds to the literature investigating the economic consequences of multi-national corporations' (MNCs') foreign cash balances (Bates, Kahle, & Stulz, 2009; Foley, Hartzell, Titman, & Twite, 2007). De Simone, Piotroski, & Tomy (2019) document that firms stockpiled cash overseas in anticipation of tax reform throughout the early 21st century. However, numerous anecdotes suggest that firms repatriated smaller amounts than were expected following the TCJA (Ruben & Francis, 2018, 2020). Thus, firms continue to hold significant cash overseas. In contrast to prior literature that examines manager-shareholder agency costs (Campbell et al., 2023; Chen, 2015; Harford et al., 2017), we investigate the economic consequences of foreign cash from the debt market's perspective. Despite differences in the nature of the two types of securities' claims, we find some similarities in the consequences of the risks and costs

of firms' foreign cash holdings for debt and equity markets. In addition, we find that the effect of foreign cash on the agency costs of debt is highest in the pre-TIPRA period, suggesting that TIPRA allowed firms to adjust their organizational structure and tax planning in a way that lowers internal financing frictions.

Our results differ from Blaylock, Downs, Mathis, and White (2022), who examine the debt pricing of permanently reinvested foreign earnings (PRE). In particular, they consider the relation between PRE and new debt issuances and fail to find a significant relation. One explanation for the lack of a result could be that PRE is an accounting construct that is subject to both estimation and disclosure considerations (Krull 2004). Thus, it can be difficult to separate the bond pricing for firms' accounting decisions rather than the underlying economics. We overcome this hurdle by examining an estimation of foreign cash holdings, which is measured and validated by Campbell et al. (2023) using BEA data. Thus, our findings arguably more closely align with firm economics.

Additionally, our paper has implications for U.S. multinational tax policy. Multinationals are continuously becoming more mobile, which creates concerns about whether and to what extent taxation (or the lack thereof) can be used to help these firms operate more efficiently (Dau, Morck, & Yeung, 2021; Foss, Mudambi, & Murtinu, 2019) while addressing both firm and governmental needs (McGaughey & Raimondos, 2019). Thus, considering how important tax legislation affects the foreign cash holdings and agency costs of debt relation is an important research area. The U.S. congress narrowly passed TIPRA. While the intended benefits were to help U.S. multinational firms be more competitive in a global landscape, public advocacy groups such as the Citizens for Tax Justice claimed that TIPRA created loopholes for multinational firms to avoid taxes.[3] While these firms' tax avoidance behavior is outside the scope of our study, we provide evidence of TIPRA's financing benefits. Specifically, our findings suggest that TIPRA improved firms' perceived credit risk by reducing tax frictions. Because these results correspond with TIPRA's goals, we provide evidence that the tax act achieved its intended benefits via

[3] See https://www.ctj.org/pdf/offshoreextendersreport.pdf for adversarial discussions on the CFC look-thru rules enacted via TIPRA.

lower agency costs of debt. However, the significant changes implemented by the TCJA do not appear to reduce the agency costs of debt associated with foreign cash. This result is important since, even after the TCJA, firms continue to hold substantial amounts of foreign cash overseas,[4] and our evidence sheds light on firms' ongoing costs for holding cash in foreign jurisdictions.

HYPOTHESIS DEVELOPMENT

Foreign Cash Holdings and Shareholder-Debtholder Agency Costs

Debtholders loan firms cash, and, in return, they receive the cash paid back over the life of the loan with interest. This process allows firms to receive cash necessary for investments and the debtholders to receive income for lending capital. A significant factor in this relationship is the relative level of risk taken by the debtholder. This risk manifests in different ways, including the costs debtholders charge firms to borrow money (i.e., the yield spread). The yield spread often runs consistent with credit ratings, which identifies and prices financial risk as the firm's cash flow relative to its existing leverage (S&P 2018). While most of the firm's business risk attributes are systematic, its financial risk is a function of its operating and investment decisions. As a result, the firm's ability to meet its debt payments is a primary determinant of its cost of debt. Thus, debtholders tend to value a constant and steady stream of cash flows when assessing the firm's credit risk.

While debtholders prefer that firms spend cash flows in a way that minimizes the likelihood of default, managers prefer spending free-cash flows on investments that grow the firm's size and influence (Jensen, 1986). Furthermore, managers often own shares in the firm, and thus maximize their utility by appeasing shareholders. Consequently, they prefer positive net present value investments with a high-reward outcome, which may involve more significant risks than debtholders prefer (Jensen & Meckling, 1976). In the absence of positive net present value investments, shareholders prefer to be paid out the cash either in the form of a dividend or share repurchase. Both investment in risky projects and the shifting of

[4] See https://www.bloomberg.com/news/articles/2019-12-19/u-s-companies-repatriated-cash-hits-1-trillion-under-tax-law

liquidity from the firm to the shareholders imparts greater risk on debt holders for two key reasons. First, these actions may diminish the firm's ability to meet future debt obligations; second, debt holders do not share the benefits of these actions (Hasan et al., 2014; Jensen & Meckling, 1976; Myers, 1977; Myers & Majluf, 1984; Shevlin, Urcan, & Vasvari, 2020). We refer to these risks as the agency costs of debt. As these costs increase, debtholders must adjust for these risks by increasing borrowing costs.

Cash holdings are central to agency costs since free-cash flows allow managers to invest in projects that a debtholder may not prefer. For example, Harford (1999) provides evidence that firms with high cash holdings undertake more acquisitions than firms with low cash holdings and that these acquisitions are overall value decreasing. Faulkender & Wang (2006) document that the incremental value of cash holdings decreases in the amount of cash holdings. While firms tend to accumulate cash holdings in response to a limited ability to access external financing (Almeida et al. 2004; Denis & Sibilkov, 2010; Acharya, Davydenko, & Strebulaev, 2012), Foley et al., (2007) shed light on another prominent reason among multinational firms. Specifically, they suggest that cash holdings become locked out of the U.S. due to repatriation costs.

Historically, repatriation costs arose from the worldwide tax system with deferral in the U.S., where earnings were taxed upon repatriation regardless of where the firms earned them.[5] However, U.S. firms frequently reinvested foreign earnings outside the U.S. and only paid taxes in the foreign jurisdiction where the cash was earned. If a firm wanted to use these cash holdings in the U.S., it would first owe the difference between the U.S. income tax rate and local jurisdiction. In examining these costs, Hanlon et al. (2015) and

[5] Prior to the TCJA, under ASC 740-30-25, MNCs were required to record deferred taxes on their foreign earnings unless the firm provides evidence that the subsidiary has invested or will invest the earnings indefinitely. Meanwhile, §965 of the Internal Revenue Code allowed firms to postpone their tax liabilities for earnings declared and substantiated as permanently reinvested. Thus, the lack of tax liability on these earnings that is afforded under §965 of the Internal Revenue Code often results in firms permanently leaving cash overseas to enhance their accounting income (Shackelford, Slemrod, & Sallee 2011). Blaylock et al. (2022) consider the relation between the cost of debt and permanently reinvested foreign earnings and find no significant result. We differ from their study by considering the estimated foreign cash holdings, which does not equate to permanently reinvested foreign earnings across two dimensions: (1) permanently reinvested foreign earnings is an accounting construct that is inherently subject to discretion, and (2) permanently reinvested foreign earnings often includes non-cash assets, which we would not expect to be as connected to the agency costs of debt.

Edwards et al. (2016) document that firms overinvest in overseas projects due to locked out cash holdings, and Harford et al. (2017) provide evidence that shareholders place a lower valuation on foreign cash holdings due to concerns related to empire building.

While researchers pay considerable attention to the shareholder valuation of foreign cash holdings and the manager-shareholder agency costs associated with these locked-out assets, prior literature largely ignores these assets' debtholder valuation and the agency costs of debt. Relative to domestic cash holdings, foreign cash generates two key issues that lead to higher agency costs of debt: (1) higher risk and complexity associated with foreign operations and investment decisions and (2) barriers to using the cash to service debt obligations. In terms of investment decisions, firms overinvesting overseas with foreign cash adversely affect agency costs of debt because these projects may not enrich future cash flows (Hanlon et al., 2015; Edwards et al., 2016). Even if the investments are considered positive net present value and benefit shareholders, the investments occur in foreign jurisdictions and naturally impart additional risks (Desai et al., 2011; Kwok & Reeb 2000; Reeb, Kwok, & Baek, 1998).[6]

In terms of using the cash to service debt obligations, the U.S. Internal Revenue Code has strict rules governing these assets' use for this purpose. Specifically, §956 states that investment of earnings by a controlled foreign corporation in U.S. property is substantially the equivalent of a dividend and would be treated similarly to the repatriation of these funds. Thus, similar to how foreign cash holdings are "locked-out" to the U.S. for investment or distribution purposes (Foley et al., 2007), these assets are also "locked-out" to service debt obligations, which includes pledging these assets as collateral for debt and making debt payments.

Anecdotal evidence supports these arguments and suggests that foreign cash holdings are less accessible to support domestic activity than domestic cash holdings. For example, a *Wall Street Journal* article states:

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[6] While both shareholders and debtholders should be concerned with manager's using foreign cash to "empire build", debtholders are incrementally concerned with manager's using foreign cash on risky investments since they bear the same downside risk without sharing in the upside of the successful investment as would a shareholder.

> Emerson Electric Co. has $2 billion of cash in the bank. But this year it had to borrow money in the U.S. to help buy back shares, distribute dividends and even pay its taxes. That's because "substantially all" of Emerson's cash is in Europe and Asia, according to the company's filings with securities regulators (Linebaugh, 2012).

Ceteris paribus, firms holding foreign cash are better able to service debt than firms with no cash holdings at all. Said another way, lenders should still view a firm with substantial foreign cash holdings to better service debt obligations than a firm with no domestic or foreign cash holdings. However, domestic cash holdings have substantially greater financial flexibility to be used within the firm. For this reason, domestic cash holdings should have lower agency costs of debt than foreign cash holdings. We posit that as the composition of firms cash holdings outside of the U.S. increases relative to their total cash holdings, firms will face higher agency costs of debt. We state our first hypothesis in the alternative form as follows:

Hypothesis 1: The agency costs of debt are increasing in foreign cash holdings.

A central tension to our hypothesis is that the reason for the cash becoming trapped, the repatriation tax liability associated with foreign cash, is only owed when firms bring the cash back to the U.S. This tax liability does not necessarily increase the probability of default. Thus, we rely on these other relations (i.e., agency costs and inability to service debt with these cash flows) as the primary avenue where the credit rating agencies price foreign cash holdings. Tension also resides in the fact that firms are not required to disclose the location of their cash holdings. The previously mentioned *Wall Street Journal* article acknowledges this point by stating that the SEC is "concerned that companies have not been presenting investors with an honest appraisal of their liquidity" (Linebaugh, 2012). Should lenders be unable to identify the amount of cash in foreign countries, then we would expect investors to price all cash holdings the same. However, some firms voluntarily provide the location of their cash holdings, and lenders have access to additional information beyond what appears in financial statements. Furthermore, in the absence of said information, lenders can also estimate foreign cash holdings' location. Thus, whether lenders price the actual audited amount of foreign cash holdings or some estimated amount of foreign cash holdings, we expect foreign cash holdings to be positively associated with agency costs of debt.

Finally, while firms cannot pledge their foreign cash holdings as collateral against their domestic borrowing, the rules do not require lenders and credit rating agencies to preclude this amount when assessing perceived credit risk.[7] Anecdotal evidence suggests that, for this reason, lenders allow firms with extensive foreign cash holdings to borrow substantially in the U.S. despite firms locating much of their cash holdings overseas (Shedlock, 2018). To the extent that this occurs, lenders may price all types of cash holdings relatively more similarly, especially if operating overseas diversifies a firm's risk profile (Reeb et al., 2001; Mansi & Reeb 2002).

Foreign Cash Holdings, Shareholder-Debtholder Agency Costs, and Recent Tax Legislation (TIPRA & TCJA)

The U.S. Constitution empowers the U.S. Congress to create tax laws. As part of their duties, the House Ways and Means Committee and the Senate Finance Committee, along with the support of the U.S. Treasury Department, constantly monitor tax issues. One concern that firms raised over the past few decades is that their competitive position, relative to non-U.S. counterparts, has diminished due to U.S. tax laws. Specifically, by having a high corporate income tax rate (Mason, 2012) and a worldwide tax system (Akamah, Hope, & Thomas, 2018; Kohlase & Pierk, 2020), U.S. firms face more significant tax burdens than their non-U.S. counterparts.

One particular concern raised in the early 2000s was the inability of U.S. firms to use foreign cash holdings efficiently. Before 2005, the U.S. taxed active income from foreign subsidiaries upon repatriation to the U.S. but taxed "Subpart F" income, such as interest, dividends, and royalties, when earned, regardless of when firms repatriate the funds. These rules for Subpart F income create frictions in the movement of funds from one foreign jurisdiction to another by imposing U.S. tax costs on such transfers (Sicular, 2007).

[7] Under Internal Revenue Code §956, the guarantee by a subsidiary made to a U.S. shareholder can give rise to a deemed dividend, and thus trigger a U.S. tax liability. However, an obligation does not include any indebtedness arriving out of an involuntary conversion, any obligation of a U.S. person arising on connecting with the provision of services for the foreign subsidiary, any obligation of a non-controlled foreign corporation foreign person arising in connection with the provision of services if the amount of the obligations is considered to be ordinary and necessary and paid within 60 days, among other specific stipulations (Internal Revenue Code §956(c)). Thus, prior to TIPRA, there were several strict rules that, under limited circumstances, permitted firms to circumvent being taxed on pledging their foreign assets as collateral for U.S. debt.

For example, consider a U.S. corporation with two foreign subsidiaries, S1 in France and S2 in Germany. If S1 issues a loan to S2, interest earned by S1 will be subject to U.S. tax when paid. This tax increases intercompany lending costs and other forms of transfers between foreign subsidiaries, decreasing the mobility of funds across foreign jurisdictions.[8]

In 2005, Congress introduced the Tax Increase Prevention and Reconciliation Act (TIPRA), which includes provisions to mitigate this tax-based disadvantage by excluding certain transfers between foreign subsidiaries from Subpart F income (Murphy 2023). A portion of this legislation, often referred to as the look-thru rules, allows U.S. firms to make intercompany transfers between their overseas subsidiaries without triggering U.S. tax.[9] It did not change the total U.S. tax on the transfers but allowed deferral of the tax until eventual repatriation to the U.S., a significant tax saving for U.S. MNCs (Scholes, Wolfson, Erickson, Hanlon, Maydew, & Shevlin, 2020).

This change in tax timing on inter-foreign-subsidiary transfers significantly changes the agency costs of debt associated with foreign cash by lowering the restrictions on using foreign cash on foreign investments. While some of these agency costs arise due to an inability to transfer funds to the U.S. without owing U.S. tax, other costs occur due to the inability to transfer funds between foreign subsidiaries without triggering U.S. tax. TIPRA alleviates some of the costs associated with foreign cash because it allows firms to move cash more efficiently to positive NPV projects that are less uncertain.[10] As we do not expect TIPRA

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[8] Prior to TIPRA, "Check the Box" stipulations introduction in 1997 made it possible for U.S. taxpayers to avoid, through a complex array of transactions, including some or all of their foreign income arising from intercompany transactions and payments from U.S. taxation (Sicular, 2007). However, these transactions involved significant complexity and were often contended by the taxing authorities (see Notice 98-11).

[9] Even though TIPRA expired on 12/31/2009, this specific "look-through" provision has been extended several times and is in effect throughout our entire sample and currently still exists.

[10] The lower costs to move funds from one foreign jurisdiction to another are different and independent from the American Jobs and Creation Act of 2004 (AJCA), which created a one-time repatriation holiday of permanently reinvested foreign earnings to be brought back the United States. Specifically, the AJCA contained provisions which did not allow favorable tax treatment to be granted to repatriated funds that were then deployed back overseas. Because these two laws were passed close to one another, we take two actions in additional analysis to ensure our inferences are not biased by this alternative legislation. First, we remove 2004 and 2005 from our sample period. Second, we remove all firms from our entire sample that repatriated funds under the AJCA. See Table 6, Panel B. Our inferences are robust to these sample adjustments, thereby mitigating concerns that the AJCA, and not TIPRA, is driving our findings.

to affect the agency costs of debt associated with domestic cash, we expect that the relative agency costs of debt associated with foreign cash decrease after TIPRA.

Conversely, Murphy's (2023) evidence that MNCs increased the number of foreign holding companies in response to TIPRA is consistent with an increase in opacity surrounding tax complexity (Balakrishnan, Blouin, & Guay, 2019), suggesting an increase in the agency costs of debt (Costello & Wittenberg-Moerman, 2011; Dhaliwal, Hogan, Trezevant, & Wilkins, 2011). Thus, relative to the agency costs of debt associated with domestic cash, the agency costs of debt associated with foreign cash may increase following TIPRA. Despite these arguments, since the directional effect of TIPRA on the agency costs of debt related to foreign cash is intended to reduce these costs, we expect that TIPRA decreased the agency costs of debt associated with foreign cash without affecting the same costs associated with domestic cash. We state our second hypothesis in the alternative form as follows:

> **Hypothesis 2:** Relative to domestic cash holdings, foreign cash holdings are associated with a larger decrease in the agency costs of debt following the Tax Increase Prevention and Reconciliation Act of 2005.

In 2017, the U.S. Congress passed the Tax Cuts and Jobs Act (TCJA) of 2017. The TCJA has numerous provisions that may affect the relation between foreign cash holdings and the cost of debt, including moving to a quasi-territorial tax system, lowering the corporate income tax rate to 21%, enacting a limitation on the amount of interest that corporations can deduct, and enacting several anti-income shifting provisions.[11] The switch to a quasi-territorial tax system from a worldwide tax system allows corporations to move cash freely to all subsidiaries throughout the world without facing additional U.S. taxation. This change should lower the agency costs of debt associated with foreign cash holdings since the cash is less restricted from being matched to positive NPV projects than it was previously. Additionally, firms can now use the cash to service debt obligations in the U.S. or be pledged as collateral to receive U.S. debt.

[11] Prior to the enactment of the TCJA, the U.S.'s high statutory tax rate led multinationals to shift income across jurisdictions as a means of lowering their taxable income (Drake, Goldman, & Murphy 2022; Foss et al., 2019; Huang, 2018; Klassen & Laplante, 2012). The decrease in the statutory tax rate from 35% to 21%, plus the enactment of the GILTI, FDII, and BEAT provisions likely lower the incentives for U.S. multinationals to shift income across countries. However, whether their income shifting activities change as a result of TCJA is outside of the scope of our study.

While many of these provisions appear to lower the agency costs of debt associated with foreign cash holdings, there are also reasons why such a decrease might not occur. Specifically, anti-income shifting provisions such as the GILTI, FDII, and BEAT adversely affect the credit risk of multinational firms relative to domestic firms since these firms now have lower benefits from multinational income shifting that take advantage of lower tax rates. To the extent that the profitability of foreign operations lower following the onset of the TCJA, we may expect lenders to value foreign cash holdings less than before the TCJA. Consequently, we may observe the relation between all cash holdings (foreign and domestic) decline following the onset of the TCJA such that the incremental effect of foreign cash holdings on the cost of debt is indistinguishable from domestic cash holdings and the cost of debt. Despite some of the negative attributes of the TCJA for multinational firms and firms with high foreign cash holdings, we expect that the benefits afforded by moving to a quasi-territorial tax system outweigh the costs from the other provisions. As a result, we expect the relation between the agency costs of debt and foreign cash holdings to decline significantly following the TCJA. We state our H3 in the alternative form as follows:

> **Hypothesis 3:** Relative to domestic cash holdings, foreign cash holdings are associated with a larger decline in the agency costs of debt following the Tax Cuts and Jobs Act of 2017.

RESEARCH DESIGN

Estimating Foreign Cash Holdings

Our hypotheses predict that foreign cash holdings are associated with higher agency costs of debt than domestic cash holdings and that such a relationship changes around the passage of TIPRA and the TCJA. Most firms do not explicitly disclose their foreign cash holdings. As a result, we follow Campbell et al., (2023) and estimate the location and amount of foreign cash holdings. Campbell et al. (2023) estimate foreign cash holdings using total cash reported in the financial statements, an estimate of foreign assets, and Exhibit 21 disclosures of material foreign subsidiaries. Consistent with their methodology we follow Oler, Shevlin, and Wilson (2007) to estimate foreign assets by assuming that asset turnover (sales divided by assets) is constant across domestic and foreign sources. Based on this assumption, we estimate total foreign assets as foreign sales divided by asset turnover and *FOREIGN ASSETS* as total foreign assets

divided by total assets. Total domestic assets equals the difference between foreign assets and total assets and *DOMESTIC ASSETS* equals total domestic assets divided by total assets.

Next, we estimate the following regression equation from Campbell et al. (2023):[12]

$$TOTAL\_CASH_{i,t}=\sum\alpha_k*COUNTRY_{k,i,t}*DOMESTIC\ ASSETS_{i,t} + \sum\beta_k*COUNTRY_{k,i,t}*FOREIGN\ ASSETS_{i,t} \quad (1)$$

In this equation, *TOTAL_CASH* equals total cash plus short-term investments divided by total assets, and *COUNTRY* is a vector of indicator variables that equal one if a firm reports a material subsidiary (as per Exhibit 21) in country k and zero otherwise.[13] Each α_k in Equation (1) estimates how the association between domestic assets and cash changes when a firm has material operations in country k. Each β_k estimates how the association between foreign assets and cash changes when a firm has material operations in country k. We use these associations to estimate the amount of cash in each country by assuming that cash associated with operations in country k is located in country k.[14] We estimate total foreign cash using the β_k vector from Equation (1) and summing across all countries as follows:

$$FOR\_CASH_{i,t}= \sum\beta_k*COUNTRY_{k,i,t}*FOREIGN\ ASSETS_{i,t} \quad (2a)$$

Similarly, we estimate domestic cash using the α_k vector from Equation (1) and summing across all countries as follows:

$$DOM\_CASH_{i,t}= \sum a_k*COUNTRY_{k,i,t}*DOMESTIC\ ASSETS_{i,t} \quad (2b)$$

Since Campbell et al. (2023) use simulated data, foreign cash 10-K disclosures, and proprietary data from the Bureau of Economic Analysis to demonstrate the accuracy of their estimates, we conduct a number of analyses to ensure our estimates are consistent with their study. First, we compute the correlation between our scaled country-level cash holdings estimates and theirs and note that the correlation coefficient

[12] In addition to equation (2), Campbell et al. (2023) also include the main effect for domestic firms. In untabulated analysis, we adjust our estimation to include that main effect and our inferences remain unchanged.

[13] Specifically, this vector includes all countries found in the Campbell et al. (2023) vector as well as additional indicator variables for countries in our sample that are classified as tax havens. In total, we examine 46 distinct countries as well as 4 additional country-categories: miscellaneous tax haven countries; miscellaneous corrupt countries; miscellaneous countries that are both tax havens and corrupt; and all other miscellaneous foreign countries not otherwise included.

[14] We also use the method described in Campbell et al. (2023) to address negative coefficients.

is 0.89. Second, in Figure 1 we graph the distribution of our estimates by country against those found in Campbell et al. (2023) The X-axis represents the percentage of all foreign cash held in a country in our sample, and the Y-axis represents this same measure in their study. We plot a line of best fit for this resulting graph. The slope of this line is 0.99 with an r-squared of 0.79. Given that a slope of 1.00 with an r-squared of 1.00 would indicate perfect alignment of our estimates, we conclude that our estimates align well with their estimates.[15]

[Insert Figure 1 here]

Empirical Tests

To test our hypotheses, we estimate the following regression equation following Becker and Ivashina 2015 and Bharath and Shumway 2008:

$$Yield_{i,t} = \alpha_0 + \beta_1 ForCASH_{i,t} + \beta_2 Post\_TIPRA_{i,t} + \beta_3 Post\_TCJA_{i,t} + \beta_4 ForCash \times Post\_TIPRA_{i,t} + \beta_5 ForCash \times PostTCJA_{i,t} + \beta_6 Size_{i,t} + \beta_7 ROA_{i,t} + \beta_8 RD_{,i,t} + \beta_9 Intan_{i,t} + \beta_{10} IntCov_{,t} + \beta_{11} ZScore_{i,t} + \beta_{12} CashRatio_{i,t} + \varepsilon_{i,t} \quad (3)$$

The dependent variable, *Yield*, is the yield spread, calculated as the yield to maturity (the internal rate of return earned by an investor who buys debt and holds it until it has fully matured) minus the Treasury bond yield for a bond of comparable duration.[16] *Post_TIPRA* and *Post_TCJA* are indicator variables equal to one for years after 2005 and 2017, respectively.[17] We test each of our three primary hypotheses simultaneously using this regression. Consistent with H1, we expect that the relation between foreign cash holdings and the yield spread is positive ($\beta_1 > 0$), suggesting that foreign cash holdings are positively associated with the cost of debt. Consistent with H2, we expect our proposed relation in H1 to decline following TIPRA ($\beta_4 < 0$). Likewise, consistent with H3, we expect that our proposed relation in H1 significantly declines following the TCJA ($\beta_5 < 0$).

[15] Given that our intent is not to replicate the Campbell et al. (2023) results, but to apply their methodology to our setting, we do not repeat each of their validation tests and instead use these comparisons to provide reassurance that our foreign cash holding estimates are reasonable.

[16] If the duration of a firm's newly issued debt does not exactly match the duration of reported treasury bond yield data, we adjust yield spread by the treasury bond yield of the closest available duration (e.g., an 8 year bond would be matched to a 7 year treasury yield while a 9 year bond would be matched to a 10 year treasury yield).

[17] We set *Post_TIPRA* equal to zero when *Post_TCJA* has a value of one.

We also include various control variables consistent with the prior literature. First, we include firm size, *Size*, calculated as the natural log of assets. We expect *Size* to be negatively associated with *Yield* because larger firms tend to be more mature and thus represent a lower risk of default. Similarly, we include *ROA*, calculated as net income scaled by total assets. Consistent with *Size*, we anticipate *ROA* to be negatively associated with *Yield* because more profitable firms tend to represent a lower default risk. Next, we control for *RD*, calculated as R&D expenses scaled by total assets. Likewise, we control for *Intan*, calculated as a firm's intangible assets scaled by total assets.[18] Higher values of *RD* and *Intan* could signal firms with less tangible assets. If so, we would expect the coefficients to be positive since these firms might carry additional risk. However, higher values of *RD* and *Intan* might also signal a greater commitment to innovation, which might lead to negative coefficients. Morevoer, we control for default risk characteristics, including *Int_Cov*, calculated as operating income before depreciation and interest expense scaled by interest expense, and *ZScore*, a firms' bankruptcy prediction score following Altman (1968). We expect *Int_Cov* and *ZScore* to be negatively associated with *Yield* as higher values of these control variables signal a lower default risk (Jiang, 2008; Liu, Ning, & Davidson, 2010; Sengupta, 1998).[19] Additionally, we include Fama-French 17 industry fixed-effects and year fixed-effects.[20] We cluster standard errors by firm.

Sample Selection

Table 1 summarizes our sample selection process. We construct an initial sample of 31,893 observations in Compustat from 1993-2019 that have a firm identifier, non-missing assets and sales, non-

[18] We set missing values of intangible assets and R&D expense to zero. Our inferences are unchanged when we remove these observations.

[19] While we generally follow controls as established by prior papers in the debt literature, in untabulated analysis we also add controls for Net Operating Losses (Heitzman & Lester, 2021) and the amount of a firm's new investments (Amberger et al., 2021). Additionally, we replace Z-Score with the amount of the firm's free-cash flow. Our inferences are unchanged across these specifications.

[20] Empirically, including year fixed effects creates an indicator variable for each year in the sample, and drops the indicator variable for the first year to prevent perfect collinearity. When also including a *Post* variable, the fixed effects still work and merely drop an additional year indicator variable for the first year in the post period to prevent perfect collinearity among the years following the onset of TIPRA. Thus, including year fixed effects and POST in the same regression does not bias our inferences. To mitigate any concerns, in untabulated analyses, we re-estimate our tests without year fixed effects and our inferences remain unchanged.

missing SIC codes, and are not in a regulated or financial industry.[21] Our initial sample removes observations without publicly traded debt information available in the TRACE dataset. We begin our sample in 1993 to capture data following the onset of SFAS 109, which significantly alters how firms accounting for their tax uncertainty. We end the sample in 2019 to mitigate concerns about differences in valuation of foreign cash holdings resulting from the COVID-19 pandemic. We next remove observations with missing information needed to calculate cash holdings or observations with an extreme amount of cash holdings (less than 0% of total assets or greater than 100% of total assets). We then remove observations missing data necessary to calculate our testing variables, including those that do not have information necessary to estimate foreign cash holdings. Our final sample contains 11,956 firm-year observations from 593 unique firms.

[Insert Table 1 here]

RESULTS

Descriptive Statistics

Table 2 Panel A presents descriptive statistics for variables included in our empirical equations. The mean (median) value for *Yield* is 3.8547 (3.5520). This value suggests that firms have an average (median) cost of debt of 3.85% (3.55%). *ForCash* has a mean (median) value of 0.0653 (0.0493). These values equate to firms holding 6.53% (4.93%) of their total assets in cash holdings outside of the U.S. The mean (median) *HavCash* is 0.0187 (0.0125). These values suggest that among the 6.53% of cash holdings held outside of the U.S., 1.87% of it is in tax haven jurisdictions. The mean value of *Post_TIPRA* and *Post_TCJA* are 0.7702 and 0.1690, respectively. These values suggest that approximately 77% of the sample is between TIPRA and the TCJA, and 17% of the sample is after the TCJA. Among our remaining the variables, the average *Size* is 9.8679 and *ROA* is 0.0620. This suggests that companies in our sample tend to be large and profitable. We also note that the average *RD* and *Intan* are 0.0291 and 0.2856, respectively. These values equate to firms spending an average of 2.91% of their total assets on R&D

[21] Specifically, we exclude sich codes Fama-French industry classifications 14 (SIC codes 4900-4999) and 16 (SIC codes 6000-6999).

expenditures on an annual basis and intangible assets comprise 28.56% of their total assets. The average *Zscore* is 3.0396. As higher scores reflect more financial stability, this value suggests that the average observation in our sample has low bankruptcy risk. Lastly, we note that the average *CashRation* is 0.1285, suggesting firms hold approximately 12.85% of their assets as cash holdings.

In Panel B, we present the frequency of observations by year. We also present the average *ForCash* and *Yield* for each year. We note that the frequency of observations increases over time. This is due to increased data availability for both TRACE and the data required to estimate foreign cash holdings. In terms of *ForCash*, we note that the amount predictably decreases following TIPRA and the TCJA as the barriers to moving it decline significantly after implementing the legislation. Furthermore, we see that *Yield* declines from 2008 to 2009, coinciding with the Financial Crisis.

[Insert Table 2 here]

Table 3 presents our correlation matrix. We present the Pearson correlations above the identity and the Spearman correlations below the identity. We find that *Yield* is negatively correlated with *ForCash* (-0.05 Pearson; -0.07 Spearman). This suggests that firms that hold more foreign cash holdings have a lower yield spread, on average. While it runs counter to our hypothesis, it also reflects the underlying necessity to consider the relation from the confines of a multivariate regression in that the univariate could reflect characteristics like larger and more profitable companies are also more likely to have substantial overseas cash holdings. We note very high correlations between *ForCash* and *HavCash*. These correlations reflect the notion that *HavCash* is a component of *ForCash.* Similarly, both *ForCash* and *HavCash* are positively related to *CashRatio* as we would expect firms with substantial overseas cash holdings also have a material total cash holdings. Among our control variables, we note no other unusual relations.[22]

[Insert Table 3 here]

[22] In untabulated analysis, we also examine the correlations and note no unusual univariate statistics. All VIF factors for our variables of interest and controls are less than 10.

Multivariate Results

Hypotheses Testing

Table 4, Panel A, examines the relation between the cost of debt and foreign cash holdings by estimating equation (1). Our dependent variable of interest is the agency costs of debt, proxied using *Yield*. To test our first hypothesis, we examine the main effect on *ForCash*. We find a positive and significant coefficient ($\beta_1 = 4.0176$, t-stat = 3.06; $p < 0.01$). This finding is consistent with H1 and suggests that foreign cash holdings are more positively associated with the agency costs of debt. To test our H2 and H3, we turn our attention to the interactions of *ForCash* × *Post_TIPRA* and *ForCash* × *Post_TCJA*, respectively. The coefficients on these terms are both negative and significant ($\beta_4 = -3.6768$, t-stat = -2.72; $p < 0.01$; $\beta_5 = -2.5572$, t-stat = -1.76; $p < 0.10$). These findings are consistent with the notion that lenders viewed these assets as less risky following this significant tax law change. In terms of economic significance, we find that, pre-TIPRA, a one-standard deviation increase in a firm's foreign cash holdings is associated with an increase in its cost of debt of 23.8 basis points. However, following TIPRA, this same increase is associated with an increase of only 2.0 basis points. This implies that TIPRA eliminated 97.1% of the cost of debt penalty associated with foreign cash holdings. In contrast, relative to the pre-TIPRA time period, TCJA eliminated only 56.5% of the cost of debt penalty associated with foreign cash holdings. Alternatively, given the rapid increase in foreign cash holdings over time, another way to contextualize our findings is to compare how much additional foreign cash a firm could hold post-TIPRA/TCJA for the same cost of debt. Our results suggest that TIPRA allows an otherwise identical mean firm to more than double (109.3% increase) its foreign cash holdings for the same cost of debt; such an increase is approximately the same as (97.1% of) the interquartile range of foreign cash holdings in our sample. The impact of TCJA, however, is a relatively more modest increase of approximately two-thirds of foreign cash holdings (63.6%) which is roughly half (56.5%) of the inter-quartile range.

[Insert Table 4 here]

To provide additional context for the relation, in Table 4, Panel B, we present the analysis split out by the three time periods: Pre-TIPRA (Column (1)), Post-TIPRA & Pre-TCJA (Column (2)), and Post-

TCJA (Column (3)). We continue to find a positive and significant relation between *Yield* and *ForCash* in Column (1) (β_1 = 7.4708, t-stat = 3.25; p < 0.01). However, consistent with Panel A, that relation significantly dissipates after TIPRA (β_1 = 0.3693, t-stat = 0.68) and declines further after the TCJA (β_1 = 0.2016, t-stat = 0.23). We also perform three F-Tests to compare the coefficients across columns. We find that the coefficient in Column (2) (Diff. = 7.4708, p < 0.01) and (3) (Diff. = 7.2692, p < 0.01) are both smaller than that of Column (1). Thus, our H1, H2, and H3 inferences remain unchanged and are further illuminated by the notion that the cost of debt significantly declines following the TIPRA and TCJA U.S. multinational tax regimes.

Additional Analysis

Tax Haven Cash Holdings

Our theory follows the notion that lenders price foreign cash holdings into the cost of debt because they are incrementally locked out of jurisdictions where they can either be used on positive net present value projects or used to facilitate debt payments. However, we treat all foreign cash holdings homogenously. Prior literature suggests that cash held in tax havens might have incrementally higher agency costs of debt (Dharmapala and Hines 2009). Moreover, the value of an incremental dollar of cash is decreasing in the level of cash held in countries with high agency costs (Campbell et al. 2023). We extend this theory to the cost of debt by investigating whether cash held in tax haven countries increase the agency costs more than other cash holdings of the firm.

To formalize this test, we re-estimate equation (3). However, we separately examine foreign cash holdings in tax haven vs. non-tax haven jurisdictions. We present our findings in Table 5. Column (1) examines foreign cash held in tax haven jurisdictions, whereas Column (2) examines foreign cash held in non-tax haven jurisdictions. For both columns we note that the coefficient on *ForCash* is positive and significant (Column (1): β_1 = 15.1351, t-stat = 2.46, p < 0.05); Column (2): β_1 = 4.7823, t-stat = 3.01, p < 0.01). However, the difference in the coefficients is shows a stronger impact for tax haven foreign cash holdings than non-tax haven foreign cash holdings (p < 0.10).

We continue to note a similar trend when examining how the relation is impacted by TIPRA and TCJA. Specifically, the coefficient on the interaction *ForCash* × *Post_TIPRA* is negative and significant in both columns (Column (1): β_4 = -13.8057, t-stat = -2.21, p < 0.05); Column (2): β_4 = -4.0572, t-stat = -2.74, p < 0.01), suggesting that TIPRA lowered the agency costs of debt for both tax haven foreign cash holdings and non-tax haven foreign cash holdings alike. However, the decline is far stronger for the tax haven foreign cash holdings (diff. = -9.2985, p < 0.10). This result is also consistent when consider the interaction *ForCash* × *Post_TCJA* (Column (1): β_5 = -12.6683, t-stat = -2.03, p < 0.05); Column (2): β_5 = -3.0860, t-stat = -1.71, p < 0.10) and the corresponding difference between the two terms (diff. = -9.5823, p < 0.10). These results collectively suggest that both tax haven and non-tax haven foreign cash holdings face significant agency costs of debt. However, tax haven foreign cash holdings faced a more significant level of these agency costs, which was subsequently more significantly reduced by legislation like TIPRA and the TCJA.[23]

[Insert Table 5 here]

Cross-Sectional Tests

Auerbach & Slemrod (1997) recommend introducing cross-sectional tests to enhance identification when examining the effects of tax law changes. Consequently, we next turn to two cross-sectional tests based on the underlying assumptions built into our analysis. We first consider the number of foreign segments held by each observation. Both TIPRA and the TCJA enhanced firms' abilities to locate cash holdings in new jurisdictions. We expect that these legislative changes more directly affect firms with a large number of overseas subsidiaries since these firms were previously more constrained in how they can move cash holdings among those subsidiaries in different countries. For example, if a U.S. multinational firm has only one overseas location, it would be less affected by TIPRA and TCJA because it would not

[23] In untablulated analysis, we sum β_1 and β_4 as well as β_1 and β_5 across both columns (1) and (2). We find that both sums result in a value that is not different from 0. This finding suggests that the differences in the agency costs of debt associated with foreign cash holdings in tax haven and non-tax haven jurisdictions is effectively eliminated from TIPRA and the TCJA. This finding is important given the continuous crackdown on firms' tax haven operations worldwide by suggesting that many of the efforts to eliminate these activities have already yielded their intended benefits.

incur lower costs between moving foreign cash holdings across non-U.S. borders. However, if the same U.S. multinational firm operates in ten countries, then we would expect it to benefit more from provisions in TIPRA (i.e., not facing tax costs when moving between foreign subsidiaries) and the TCJA (i.e., shifting to a quasi-territorial tax system).

To test this additional analysis, we re-estimate equation (1). Our primary specification already examines two-way interactions. To facilitate interpretation of our results, we avoid using a three-way interaction and instead split our sample based on whether the firm-year observation has operations in a significant number of foreign countries vs. not. We define a significant number relative to the sample population and set the bar at more than 7, which is the number of foreign countries among the top 25% of our sample. We determine the number of countries firms operate in based on the observation's Exhibit 21 filings.

We present these results in Table 6, Panel A. Column (1) presents the regression estimates among observations we deem as having low foreign segments, whereas Column (2) presents the estimates for observations with high foreign segments. Interestingly, the coefficient on *ForCash* in Column (1) (β_1 = -3.7030, t-stat = -0.73) is not only insignificant, but, directionally, it goes opposite of the rest of our findings. Meanwhile, the primary result remains consistent among observations with high foreign segments in Column (2) (β_1 = 3.5848, t-stat = 2.66, $p < 0.01$). These results suggest that even before legislation like TIPRA and TCJA, the agency costs of debt imposed by foreign cash holdings was predominantly borne by observations that had significant foreign disaggregation.

In turning to our analysis considering the two tax law changes, we continue to note a similar trend in that our primary results hold for observations with high foreign segments in Column (2) (β_4 = -3.3104, t-stat = -2.41, $p < 0.05$; β_5 = -2.8754, t-stat = -1.91, $p < 0.10$). Meanwhile, these results dissipate (and directionally opposite) among observations with low foreign segments in Column (1) (β_4 = 4.8979, t-stat = 0.94; β_5 = 5.7847, t-stat = 1.12).[24] These results collectively suggest that observations that had large segment

[24] F-tests reveal that the difference in β_4 and β_5 coefficients across columns (1) and (2) are different ($p < 0.10$).

operations were significantly more affected by the agency costs of debt than observations with few segment operations, and the beneficial attributes from TIPRA and TCJA were primary only borne by those observations with significant segment observations.

Our second cross-sectional test considers firm attributes associated with their ability to artificially locate earnings in different jurisdictions. While economic presence is necessary for many multinational tax planning strategies (i.e., Drake, Goldman, and Murphy 2022; De Simone, Klassen, and Seidman 2022), other studies provide evidence that intangibles are often the assets utilized to achieve these objectives (De Simone 2016; De Simone, Klassen, and Seidman 2017; De Simone Huang, and Krull 2020). Consequently, we posit that our primary results will be more concentrated among more innovative companies that are more likely to be generating intangible assets.

To test this additional analysis, we re-estimate equation (1). Like our foreign segments test, we split our sample to avoid a three-way interaction term. For this test, we split the sample based on whether it has high R&D expenditures (i.e., in the top 25%) as a percentage of total assets. Panel B presents our findings with observations with high R&D in Column (2) and low R&D in Column (2). Like the segments results in Panel A, we see all of our primary results concentrated in just one set of firms. In the case of these tests, it is, as expected, those observations with high R&D expenditures in Column (1) (β_1 = 2.9984, t-stat = 2.19, $p < 0.05$; β_4 = -3.2276, t-stat = -2.25, $p < 0.05$; β_5 = -3.6973, t-stat = -2.44, $p < 0.05$). Meanwhile the coefficients on each of our variables of interest in Column (2) are insignificant.[25] These results collectively suggest that observations that had significant R&D expenditures were the only ones impacted by the agency costs of debt. Meanwhile, the beneficial attributes from TIPRA and TCJA were only borne by those observations with significant R&D. Combined with our segments test, we provide clear cross-sectional results consistent with foreign cash holdings generating agency costs of debt, which is then mitigated by significant tax legislation like TIPRA and the TCJA.

[25] The F-tests examining the differences between the coefficients in columns (1) vs. (2) are not significant. Thus, we do not claim that the results are stronger for high R&D firms, and instead, we only highlight that the results are concentrated among the high R&D firms.

[Insert Table 6 here]

Robustness Tests

We perform several robustness tests. See Table 7. First, we remove the years 2008 and 2009 from our sample (Column (1)). Given that our sample period includes the financial crisis, we deem it prudent to ensure that a significant event is not driving our findings. Second, we use Audit Analytics to identify all firms that repatriated under the AJCA. In Column (2), we remove these firms from our sample to utilize this tax law change to repatriate funds back to the U.S. in 2004 or 2005. Lastly, in Column (3), we remove observations that do not appear in at least two consecutive regime. This robustness test helps ensure that our results are not biased by firms that only appear in one regime period in our sample. In all three columns, we continue to find evidence consistent with our primary testing model.

[Insert Table 7 here]

CONCLUSION

Despite the significant growth of U.S. firms' foreign cash holdings, extant research examining the capital market consequences of these assets almost entirely focuses on their effects on equity markets. This study investigates the economic implications of firms' growing foreign cash balances from the perspective of the debt market. Agency costs of debt associated with foreign cash holdings may adversely affect borrowing costs. Different from equity, debt holders do not accrue benefits from risky foreign investments but do bear downside risk, increasing the potential effect of foreign cash holdings on the cost of debt. Our evidence suggests that foreign cash holdings (as proxied using estimated foreign cash holdings from Campbell et al. (2023)) are more positively associated with the credit ratings relative to domestic cash holdings. Following TIPRA and the TCJA, acts with provisions that lower financing frictions to move cash holdings from one foreign jurisdiction to another, we find that these agency costs of debt associated with foreign cash holdings significantly decline. Our inferences are robust to alternate specifications and samples.

This study provides new evidence of the economic implications of foreign cash holdings by increasing our understanding of the agency costs of debt associated with foreign cash. Our findings also

have numerous policy implications given the lack of benefits noted about the agency costs of debt associated with foreign cash holdings relative to domestic cash holdings following the TCJA. These findings are particularly relevant amidst the calls from research to assess and address the inefficiencies in our multinational taxation system (Foss et al., 2019; McGaudhey & Raimondos, 2019).

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APPENDIX A

Variable Definitions

Dependent Variables	
Yield	The scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields.
Independent Variables of Interest	
ForCash	Total foreign cash scaled by total assets following Campbell et al (2023). This method estimates cash holdings at a country-by-country level using the location of a firm's material subsidiaries per Exhibit 21.
HavCash	Total foreign cash held in tax havens scaled by total assets following Campbell et al (2023). This method estimates cash holdings at a country-by-country level using the location of a firm's material subsidiaries per Exhibit 21; for HavCash, we sum cash estimates only for cash estimated to be held in tax haven countries.
NonHavCash	Total foreign cash not held in a tax haven; this variable is equivalent to *ForCash – HavCash*.
POST_TIPRA	An indicator variable equal to 1 for firm-years following the enactment of the TIPRA and prior to the enactment of the TCJA.
POST_TCJA	An indicator variable equal to 1 for firm-years following the enactment of the TCJA.
Primary Control Variables	
SIZE	The natural logarithm of a firm's total assets (at)
ROA	A firm's return on its assets (ni/at).
RD	Research and development expense (xrd) scaled by total assets (at). This variable is assigned a value of zero if missing.
INTAN	Intangibles (intan) scaled by total assets (at). This variable is assigned a value of zero if missing.
INT_COV	The number of times a firm's operating income exceeds its interest expense; ((OIBDP+xint)/xint).
ZSCORE	A firm's Z-Score calculated following Altman (1968) and implemented as 3.3*(pi+xint)/at + 1.2*(wcap/at) + 0.99*(sale/at) + 1.4*(re/at) + 0.6*(prcc_f*csho/lt)

CashRatio	Total cash (che, or ch+ivst if che is not available) holdings scaled by total assets (at).
AJCA	An indicator variable equal to 1 if a firm repatriated foreign cash holdings under the provisions of the “one-time” tax holiday provided by the AJCA.
Mat_AJCA	An indicator variable equal to 1 if a firm repatriated a material amount of foreign cash holdings (>= 25%) under the provisions of the “one-time” tax holiday provided by the AJCA.

TABLE 1
Sample Selection Table

2002 through 2019 unique CUSIP firm years with valid Compustat identifying information (gvkey, fyear) and mathcing publicly traded debt information available in TRACE.	31,893
Less: missing information needed to calculate cash or with an extreme amount of cash (<0% of assets or > 100% of assets)	-1,102
Less: missing key control variables	-2,850
Less: missing information necessary to estimate foreign cash holdings	-15,985
Total Observations for Main Analysis	**11,956**

TABLE 2

Panel A: Descriptive Statistics

Variable	N	Mean	Median	Std Dev	25th Pctl	50th Pctl	75th Pctl
Yield	11,956	3.8547	3.5520	2.2846	2.3547	3.5520	4.9706
ForCash	11,956	0.0653	0.0493	0.0593	0.0200	0.0493	0.0935
HavCash	11,956	0.0187	0.0125	0.0212	0.0046	0.0125	0.0250
Post_TIPRA	11,956	0.7702	1	0.4207	1	1	1
Post_TCJA	11,956	0.1690	0	0.3748	0	0	0
Size	11,956	9.8679	9.8916	1.3740	8.9172	9.8916	10.8145
ROA	11,956	0.0620	0.0620	0.0639	0.0321	0.0620	0.0953
RD	11,956	0.0291	0.0155	0.0386	0	0.0155	0.0443
Intan	11,956	0.2856	0.2604	0.2120	0.1068	0.2604	0.4269
IntCov	11,956	15.3434	11.6882	14.7859	7.9022	11.6882	17.7159
ZScore	11,956	3.0396	2.9173	1.4721	2.0294	2.9173	3.7945
CashRatio	11,956	0.1285	0.0946	0.1196	0.0426	0.0946	0.1663
AJCA	11,956	0.0143	0	0.1187	0	0	0
Mat_AJCA	11,956	0.0023	0	0.0483	0	0	0

Panel B: Observations by Year

Year	Frequency	Percent	Average *ForCash*	Average *Yield*
2002	116	0.97%	0.0578	5.9529
2003	168	1.41%	0.0658	5.8293
2004	180	1.51%	0.0815	5.1661
2005	263	2.20%	0.0641	6.1318
2006	283	2.37%	0.0568	5.9570
2007	372	3.11%	0.0605	5.9173
2008	465	3.89%	0.0587	7.1790
2009	551	4.61%	0.0716	4.8430
2010	626	5.24%	0.0700	4.0693
2011	774	6.47%	0.0667	3.1758
2012	744	6.22%	0.0644	2.7586
2013	855	7.15%	0.0686	3.1030
2014	1,049	8.77%	0.0676	3.1751
2015	1,081	9.04%	0.0661	3.3904
2016	1,262	10.56%	0.0719	3.2142
2017	1,146	9.59%	0.0672	3.9216
2018	958	8.01%	0.0614	3.6453
2019	1,063	8.89%	0.0522	3.0394

Notes: Table 2 Panel A presents descriptive statistics for our testing sample. We measure the cost of debt using Yield, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields.. We measure foreign cash holdings as ForCash, which we compute following Campbell et al (2023).. HavCash follows the same definition as ForCash, except it captures the specific cash holdings in those jurisdictions labeled as a tax haven. Post_TIPRA is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. Post_TCJA is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. Size is calculated as the natural logarithm of total assets. ROA is calculated as the firm's return on assets (net income scaled by total assets). RD is calculated as the total research and development expenses scaled by total assets. INTAN is calculated as the firm's total intangible assets scaled by total assets. IntCov is the number of times a firm's operating income exceeds its interest expense; ((OIBDP+xint)/xint).. ZSCORE is calculated in accordance with Altman (1968). CashRatio is total cash (che, or ch+ivst if che is not available) holdings scaled by total assets (at).. AJCA is an indicator variable equal to 1 if a firm repatriated foreign cash holdings under the provisions of the "one-time" tax holiday provided by the AJCA.. Mat_AJCA is an indicator variable equal to 1 if a firm repatriated a material amount of foreign cash holdings (>= 25%) under the provisions of the "one-time" tax holiday provided by the AJCA.. See the Appendix for a detailed discussion and calculation of each variable. In Panel B, we present observations by year along with the average of *Yield* and *ForCash*.

TABLE 3
Correlation Matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Yield	(1)	1	**-0.05**	**-0.09**	**-0.03**	**-0.10**	**-0.31**	**-0.29**	**-0.08**	**-0.17**	**-0.23**	**-0.25**	**-0.10**
ForCash	(2)	**-0.07**	1	**0.79**	**0.05**	**-0.07**	0.01	**0.18**	**0.33**	**-0.18**	**0.17**	**0.28**	**0.40**
HavCash	(3)	**-0.10**	**0.87**	1	**0.02**	0.00	**0.09**	**0.14**	**0.27**	**-0.18**	**0.17**	**0.24**	**0.49**
Post_TIPRA	(4)	**-0.04**	**0.07**	**0.05**	1	**-0.83**	**-0.08**	**-0.04**	0.00	**-0.03**	**0.07**	**0.02**	**0.08**
Post_TCJA	(5)	**-0.12**	**-0.08**	**-0.04**	**-0.83**	1	**0.16**	**0.08**	-0.01	**0.10**	**-0.07**	-0.01	**-0.06**
Size	(6)	**-0.27**	**0.04**	**0.11**	**-0.08**	**0.15**	1	**0.19**	**0.08**	**0.04**	**0.23**	0.00	**0.07**
ROA	(7)	**-0.25**	**0.20**	**0.19**	**-0.02**	**0.05**	**0.18**	1	**0.15**	**0.04**	**0.39**	**0.60**	**0.22**
RD	(8)	**-0.12**	**0.40**	**0.38**	0.00	**-0.03**	**0.15**	**0.26**	1	**0.04**	**0.23**	**0.24**	**0.49**
Intan	(9)	**-0.19**	**-0.14**	**-0.13**	**-0.03**	**0.10**	0.00	**0.08**	**0.13**	1	**-0.09**	**-0.06**	**-0.17**
IntCov	(10)	**-0.36**	**0.27**	**0.26**	**0.06**	**-0.04**	**0.35**	**0.62**	**0.30**	-0.01	1	**0.49**	**0.22**
ZScore	(11)	**-0.25**	**0.27**	**0.26**	**0.04**	**-0.04**	**0.02**	**0.65**	**0.21**	**-0.03**	**0.69**	1	**0.27**
CashRatio	(12)	**-0.09**	**0.55**	**0.55**	**0.09**	**-0.09**	**0.07**	**0.26**	**0.50**	**-0.17**	**0.27**	**0.31**	1

Notes: Table 3 presents the Pearson (Spearman) correlation matrix above (below) the identity for our testing sample. We measure the cost of debt using *Yield*, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields.. We measure foreign cash holdings as *ForCash*, which we compute following Campbell et al (2023). *HavCash* follows the same definition as *ForCash*, except it captures the specific cash holdings in those jurisdictions labeled as a tax haven. *Post_TIPRA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. *Post_TCJA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. *Size* is calculated as the natural logarithm of total assets. *ROA* is calculated as the firm's return on assets (net income scaled by total assets). *RD* is calculated as the total research and development expenses scaled by total assets. *INTAN* is calculated as the firm's total intangible assets scaled by total assets. *IntCov* is the number of times a firm's operating income exceeds its interest expense; ((OIBDP+xint)/xint). *ZSCORE* is calculated in accordance with Altman (1968). *CashRatio* is total cash (che, or ch+ivst if che is not available) holdings scaled by total assets (at). *AJCA* is an indicator variable equal to 1 if a firm repatriated foreign cash holdings under the provisions of the "one-time" tax holiday provided by the AJCA. *Mat_AJCA* is an indicator variable equal to 1 if a firm repatriated a material amount of foreign cash holdings (>= 25%) under the provisions of the "one-time" tax holiday provided by the AJCA. See the Appendix for a detailed discussion and calculation of each variable. See the Appendix for a detailed discussion and calculation of each variable. All terms in bold are significant at the $p < 0.05$ significance level.

TABLE 4
Panel A: Multivariate Analysis

DV = *Yield*	(1) Coef. (t-stat)
Intercept	9.7836***
	(29.45)
ForCash	**4.0176*** **
	(3.06)
Post_TIPRA	-1.2028***
	(-8.13)
Post_TCJA	-2.0181***
	(-12.51)
ForCash*×*Post_TIPRA	**-3.6768*** **
	(-2.72)
ForCash*×*Post_TCJA	**-2.5572***
	(-1.76)
Size	-0.3564***
	(-13.82)
ROA	-3.5377***
	(-6.44)
RD	-2.2783**
	(-2.54)
Intan	-1.2807***
	(-7.78)
IntCov	-0.0065***
	(-3.22)
ZScore	-0.2243***
	(-8.36)
CashRatio	0.0893
	(0.32)
N	11,956
Adj R-Sq	0.3912
Fixed Effects	Year, FF17
Clustered S.E.	Firm

Panel B: Multivariate by Time Period

DV = *Yield*	(1) Pre-TIPRA Coef. (t-stat)	(2) Post-TIPRA & Pre-TCJA Coef. (t-stat)	(3) Post-TCJA Coef. (t-stat)
Intercept	7.0140***	10.5405***	8.5409***
	(5.48)	(27.39)	(16.82)
ForCash	**7.4708*** **	**0.3693**	**0.2016**
	(3.25)	**(0.68)**	**(0.23)**
Test: *ForCash* (1) - (2) = 0	**7.4708*** **		
(z-stat)	**(3.00)**		
Test: *ForCash* (1) - (3) = 0	**7.2692*** **		
(z-stat)	**(2.95)**		
Test: *ForCash* (2) - (3) = 0	**0.1677**		
(z-stat)	**(0.16)**		
N	727	9,208	2,021
Adj R-Sq	0.1391	0.3856	0.3913
Controls	Yes	Yes	Yes
Fixed Effects	Year, FF17	Year, FF17	Year, FF17
Clustered S.E.	Firm	Firm	Firm

Notes: Table 4 presents coefficients and t-statistics from estimating equation (3), which estimates the relation between foreign cash holding and the cost of debt. Panel A presents our primary analysis, whereas Panel B presents the analysis by time period. We measure the cost of debt using *Yield*, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields. We measure foreign cash holdings as *ForCash*, which we compute following Campbell et al (2023). *HavCash* follows the same definition as *ForCash*, except it captures the specific cash holdings in those jurisdictions labeled as a tax haven. *Post_TIPRA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. *Post_TCJA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. *Size* is calculated as the natural logarithm of total assets. *ROA* is calculated as the firm's return on assets (net income scaled by total assets). *RD* is calculated as the total research and development expenses scaled by total assets. *INTAN* is calculated as the firm's total intangible assets scaled by total assets. *IntCov* is the number of times a firm's operating income exceeds its interest expense; ((OIBDP+xint)/xint). *ZSCORE* is calculated in accordance with Altman (1968). *CashRatio* is total cash (che, or ch+ivst if che is not available) holdings scaled by total assets (at). Panel B presents the same estimation but with no interactions since we perform the analysis by time period. For Panel B, we suppress control variables for presentation purposes. See the Appendix for a detailed discussion and calculation of each variable. All analysis includes year and industry (FF17) fixed effects and firm-clustered standard errors. *, ** and *** reflects statistical significance (two-tailed for multivariate analysis and one-tailed for F-tests) at the 10%, 5%, and 1% levels, respectively.

TABLE 5
Tax Haven Cash Tests

ForCash = DV = *Yield*	(1) *HavenCash* Coef. (t-stat)	(2) *NonHavenCash* Coef. (t-stat)
Intercept	9.8084***	9.7900***
	(29.09)	(29.73)
ForCash	**15.1351****	**4.7823*****
	(2.46)	**(3.01)**
Post_TIPRA	-1.2273***	-1.2161***
	(-8.39)	(-8.29)
Post_TCJA	-2.0147***	-2.0192***
	(-12.84)	(-12.64)
ForCash×Post_TIPRA	**-13.8057****	**-4.5072*****
	(-2.21)	**(-2.74)**
ForCash×Post_TCJA	**-12.6683****	**-3.0860***
	(-2.03)	**(-1.71)**
Test: *ForCash×Post_TIPRA* [1] - [2] = 0	**10.3531***	
(z-stat)	**1.63**	
Test: *ForCash×Post_TIPRA* [1] - [2] = 0	**-9.2985***	
(z-stat)	**(-1.44)**	
Test: *ForCash×Post_TCJA* [1] - [2] = 0	**-9.5823***	
(z-stat)	**(-1.48)**	
N	11,956	11,956
Adj R-Sq	0.3911	0.3911
Controls	Yes	Yes
Fixed Effects	Year, FF17	Year, FF17
Clustered S.E.	Firm	Firm

Notes: Table 5 presents coefficients and t-statistics from estimating a modified version of equation (3), to estimate the relation between foreign cash holding and the cost of debt for cash held in tax havens vs. non-tax havens. We measure the cost of debt using *Yield*, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields. We measure foreign cash holdings as *ForCash*, which we compute following Campbell et al (2023). *HavCash* follows the same definition as *ForCash*, except it captures the specific cash holdings in those jurisdictions labeled as a tax haven. *NonHavenCash* is the amount of foreign cash *ForCash)* not held in tax havens. *Post_TIPRA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. *Post_TCJA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. We suppress control variables for presentation purposes. See the Appendix for a detailed discussion and calculation of each variable. All analysis includes year and industry (FF17) fixed effects and firm-clustered standard errors. *, ** and *** reflects statistical significance (two-tailed for multivariate analysis and one-tailed for F-tests) at the 10%, 5%, and 1% levels, respectively.

TABLE 6
Panel A: Foreign Presence Tests

DV = *Yield*	(1) *LowForPres* Coef. (t-stat)	(2) *HighForPres* Coef. (t-stat)
Intercept	10.6659***	9.7546***
	(17.83)	(23.18)
ForCash	**-3.7030**	**3.5848*** **
	(0.73)	**(2.66)**
Post_TIPRA	-1.4718***	-1.3501***
	(-4.23)	(-7.62)
Post_TCJA	-1.7345***	-2.2337***
	(-4.46)	(-11.97)
ForCash×Post_TIPRA	**4.8979**	**-3.3104** **
	(0.94)	**(-2.41)**
ForCash×Post_TCJA	**5.7847**	**-2.8754***
	(1.12)	**(-1.91)**
Test: *ForCash* [1] - [2] = 0	**-7.2879***	
(z-stat)	**(-1.29)**	
Test: *ForCash×Post_TIPRA* [1] - [2] = 0	**8.2084***	
(z-stat)	**(1.52)**	
Test: *ForCash×Post_TCJA* [1] - [2] = 0	**8.6601***	
	(1.61)	
N	3,247	8,709
Adj R-Sq	0.3853	0.4099
Controls	Yes	Yes
Fixed Effects	Year, FF17	Year, FF17
Clustered S.E.	Firm	Firm

Panel B: R&D Tests

DV = *Yield*	(1) *HighRD* Coef. (t-stat)	(2) *LowRD* Coef. (t-stat)
Intercept	10.6659***	9.7546***
	(17.83)	(23.18)
ForCash	**2.9984****	**0.0771**
	(2.19)	**(0.02)**
Post_TIPRA	-1.2458***	-1.3451***
	(-6.86)	(-4.16)
Post_TCJA	-1.9691***	-2.0161***
	(-9.86)	(-5.74)
ForCash*×*Post_TIPRA	**-3.2276****	**3.2357**
	(-2.25)	**(0.64)**
ForCash*×*Post_TCJA	**-3.6973****	**-0.7641**
	(-2.44)	**(-0.14)**
Test: *ForCash* [1] - [2] = 0	**2.9213**	
(z-stat)	**(0.56)**	
Test: *ForCash*×*Post_TIPRA* [1] - [2] = 0	**-6.4630**	
(z-stat)	**(1.23)**	
Test: *ForCash*×*Post_TCJA* [1] - [2] = 0	**-2.9332**	
(z-stat)	**(0.53)**	
N	8,238	3,718
Adj R-Sq	0.3816	0.3972
Controls	Yes	Yes
Fixed Effects	Year, FF17	Year, FF17
Clustered S.E.	Firm	Firm

Notes: Table 6 presents coefficients and t-statistics from estimating a modified version of equation (3), which examines the relation between foreign cash holding and the cost of debt among firms with high vs. low foreign segments (Panel A) and high vs. low R&D expenditures (Panel B). We measure the cost of debt using *Yield*, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields. We measure foreign cash holdings as *ForCash*, which we compute following Campbell et al (2023). *Post_TIPRA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. *Post_TCJA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. We suppress control variables for presentation purposes. See the Appendix for a detailed discussion and calculation of each variable. All analysis includes year and industry (FF17) fixed effects and firm-clustered standard errors. *, ** and *** reflects statistical significance (two-tailed for multivariate analysis and one-tailed for F-tests) at the 10%, 5%, and 1% levels, respectively.

TABLE 7
Robustness Tests

DV = *Yield*	(1) *Excl. 2008 & 2009* Coef. (t-stat)	(2) *Excl Repat Firms* Coef. (t-stat)	(3) *Two Cons. Regimes* Coef. (t-stat)
Intercept	9.6528***	9.7816***	9.3374***
	(29.25)	(28.98)	(25.15)
ForCash	**3.529*** **	**4.1345*** **	**3.7353*** **
	(2.85)	**(2.66)**	**(3.01)**
Post_TIPRA	-1.2516***	-1.1958***	-1.2665***
	(-8.46)	(-7.75)	(-8.26)
Post_TCJA	-2.0437***	-2.0110***	-2.0276***
	(-12.63)	(-12.03)	(-12.09)
ForCash×Post_TIPRA	**-3.4632** **	**-3.7913** **	**-3.7109*** **
	(-2.54)	**(-2.38)**	**(-2.87)**
ForCash×Post_TCJA	**-2.7276***	**-2.6709**	**-3.2884** **
	(-1.88)	**(-1.60)**	**(-2.37)**
N	10,940	11,928	10,374
Adj R-Sq	0.3475	0.3907	0.4178
Controls	Yes	Yes	Yes
Fixed Effects	Year, FF17	Year, FF17	Year, FF17
Clustered S.E.	Firm	Firm	Firm

Notes: Table 7 presents coefficients and t-statistics from estimating a modified version of equation (3), which examines the relation between foreign cash holding and the cost of debt. Columns (1), (2), a (3) present our robustness tests which exclude 2008 and 2009, exclude firms that materially repatrirated under the AJCA, and removes observations that do not appear in at least two consecutive regimes, respectively. We measure the cost of debt using *Yield*, defined as the scaled difference between the yield on a firm's debt, as reported by TRACE observations, and the closest matched to maturity yield on U.S. Treasury debt. This difference is calculated for each firm-bond observation in TRACE and aggregated by taking a trade-size weighted average of observed yields. We measure foreign cash holdings as *ForCash*, which we compute following Campbell et al (2023). *Post_TIPRA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TIPRA and prior to TCJA, and 0 otherwise. *Post_TCJA* is an indicator variable set equal to 1 for all firm-year observations following the onset of the TCJA, and 0 otherwise. We suppress control variables for presentation purposes. See the Appendix for a detailed discussion and calculation of each variable. All analysis includes year and industry (FF17) fixed effects and firm-clustered standard errors. *, ** and *** reflects statistical significance (two-tailed for multivariate analysis and one-tailed for F-tests) at the 10%, 5%, and 1% levels, respectively.