Foreign Cash: Taxes, Internal Capital Markets and Agency Problems

Jarrad Harford[*]
University of Washington
jarrad@uw.edu

Cong Wang
Chinese University of Hong Kong
congwang@baf.cuhk.edu.hk

Kuo Zhang
Chinese University of Hong Kong
zhangkuo@baf.cuhk.edu.hk

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Abstract

The greater is the fraction of a firm's cash held overseas, the lower shareholders value that cash. This goes beyond a pure tax effect—the repatriation tax friction disrupts the firm's internal capital market, distorting its investment policy. Firms underinvest domestically and overinvest abroad. Our findings are more pronounced when firms are subject to higher repatriation tax rates, higher costs of borrowing, and more agency problems. Overall, our evidence suggests that a combination of taxes, financing frictions, and agency problems leads to a valuation discount for foreign cash and documents real effects of how foreign earnings are taxed.

1. Introduction

"Emerson Electric Co. has $2 billion of cash in the bank. But this year (2012) 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. …… [The firm] could always bring that cash back home, but it would be taxed at the 35% rate on corporate profits minus whatever tax it has already paid overseas."[1] (Kate Linebaugh, the Wall Street Journal, Dec 4, 2012)

U.S. multinational corporations (MNCs hereafter) hold trillions of dollars of cash overseas to avoid the taxes associated with repatriating foreign earnings.[2] The large amount of cash "trapped" overseas has drawn continuous attention from the media, policy makers, investors, and academic scholars. On April 30, 2013, this issue made the headlines again when Apple Inc. completed its bond offering for the first time in nearly two decades. Instead of repatriating its $102 billion offshore cash that would have been taxed by the U.S. government, Apple chose to borrow $17 billion to finance its investments in the domestic market and share buybacks.[3] Given the huge imbalance of corporate liquidity between MNCs' balance sheets and their actual operations, the debate over the merits and drawbacks of the current taxation system has intensified. In recent work, Pinkowitz, Stulz and Williamson (2014) document that while U.S. firms' cash policies are no different from foreign firms' policies at the median, the extreme right tail of U.S. MNCs' cash holdings pushes the average U.S. holding well above their foreign counterparts. In this paper, we aim to contribute to this debate by investigating how, through financing frictions and potential agency problems, the tax constraint affects the way the cash is deployed and, hence how shareholders value companies' foreign cash holdings.

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[1] Kate Linebaugh, "Top U.S. Firms are Cash-Rich Abroad but Poor at Home", the Wall Street Journal (December 4, 2012).

[2] Carl Levin, senior U.S. senator and chairman of PSI (Permanent Subcommittee on Investigations), states in a hearing on "Offshore Profit Shifting and the U.S. Tax Code" that "U.S. multinational corporations have stockpiled $1.7 trillion in earnings offshore". Foley, Hartzell, Titman, and Twite (2007) document that the high tax costs associated with repatriating foreign income can explain the significant amounts of cash held by U.S. MNCs.

[3] Peter Lattman and Peter Eavis, "To Satisfy Its Investors, Cash-Rich Apple Borrows Money", the New York Times (April 30, 2013).

Under the current U.S. tax law, U.S. companies are taxed on a global basis. Since the foreign subsidiaries of MNCs are also taxed by tax authorities of the host countries, U.S. tax law grants tax credits for foreign income taxes already paid abroad to avoid double taxation. Firms can also utilize the excess tax credits from high tax rate jurisdictions to offset the U.S. taxes owed from low tax rate countries. Moreover, unlike income earned in the U.S. which is taxed immediately, foreign earnings are not taxed until they are actually repatriated to the U.S. parent company via dividend. Generally speaking, the incremental U.S. tax rate on repatriated foreign earnings is roughly equal to the difference between the U.S. tax rate and foreign tax rate averaged across different jurisdictions. Since the U.S. has one of the highest tax rates in the world, the current tax system creates incentives for MNCs to delay taxation by deferring the repatriation of foreign earnings. Consistent with this conjecture, Foley, Hartzell, Titman, and Twite (2007) find that firms facing higher tax costs associated with repatriating foreign income keep higher levels of cash abroad. Holding significant amounts of cash abroad can defer the repatriation tax costs and reduce the present value of tax payments. As a result, shareholders may place a higher value on a firm's cash holdings when it keeps a higher portion of cash abroad.[4]

While it is likely tax-efficient to defer the repatriation of foreign cash, holding so much cash abroad can also have significant costs. First, liquidity conditions at the parent company can be adversely affected. Since external financing is costly, large cash holdings can mitigate the underinvestment problem by satisfying companies' needs for capital when there are positive NPV projects (Almeida, Campello, and Weisbach, 2004; Denis and Sibilkov, 2010). However, the current tax system creates frictions in a firm's internal capital market and may render the above argument inapplicable to cash holdings "trapped" in foreign operations. The costs of repatriating create disincentives for MNCs to use foreign cash to fund domestic investment, dividend payouts, and share buybacks.[5] These companies will end up either

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[4] Indeed, Faulkender and Smith (2014) provide evidence consistent with firms carefully balancing their use of debt as a tax shield with the ability to defer taxes on a significant portion of their total earnings, when such earnings occur abroad in low tax jurisdictions.

[5] Zion, Varshney, and Burnap (2011) estimate that the $1.3 trillion of permanently reinvested earnings (PRE) will be subject to a 28 percent tax rate when they are repatriated.

abandoning the positive NPV projects in the domestic market or resorting to costly external financing to raise the capital. Therefore, shareholders would place a lower value on firms' cash holdings when a large portion of these cash reserves are held outside the country.

Secondly, excess cash held overseas creates more agency problems and intensifies the conflicts of interest between managers and shareholders. Cash is the most liquid among all corporate assets and is most prone to managerial rent-extraction (Jensen, 1986; Harford, 1999). The free cash flow problem is exacerbated when a large portion of firms' cash is held at MNCs' foreign subsidiaries where operations are often subject to a lower level of transparency due to organizational and financial complexity.[6] In addition, a foreign division's long geographic distance from corporate headquarters generates substantial oversight costs for both directors and shareholders, since making on-site visits is more difficult and time-consuming. This undermines directors' and shareholders' abilities and incentives to closely monitor the use of cash at foreign subsidiaries. The market valuation of the company's cash would be negatively affected when shareholders anticipate that corporate cash holdings are more likely to be misused.

To test these differing predictions, we manually collect a sample of U.S. MNCs that disclose their foreign cash holdings and examine how the proportion of cash held overseas affects shareholders' valuation of a company's cash holding. We find that the marginal value of cash declines as the proportion of a firm's total cash that is held abroad (foreign cash ratio) increases and the effect is economically significant: a one standard deviation (0.29) increase in foreign cash ratio is associated with a reduction of the marginal value of cash by $0.49. These results show that shareholders place a significant discount on MNCs' cash trapped overseas.

We next investigate the channels through which foreign cash holdings reduce the marginal value of cash. First, we examine whether high tax costs faced by U.S. MNCs when repatriating foreign cash result in the lower valuation. Foley et al. (2007) document that the tax costs associated with repatriating

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[6] A recent article in the WSJ shows that U.S. MNCs are trying to limit information disclosure about their offshore operations, in particular units operating in countries regarded as tax havens. See Jessica Holzer, "A 'Curious' Fade-Out of Subsidiaries at U.S. Firms", the WSJ (May 24, 2013).

foreign income are the primary reasons why U.S. MNCs retain excess cash abroad. Following their empirical strategy, we construct proxies for the tax burden of repatriation and find that the foreign cash valuation discount is significantly attenuated when the tax costs are zero or relatively low.

We also examine whether domestic liquidity conditions affect the valuation discount of foreign cash. Existing studies in the literature have shown that liquid assets are valued more for financially constrained firms (Faulkender and Wang, 2006; Pinkowitz, Stulz, and Williamson, 2006; Denis and Sibilkov, 2010). Therefore, firms that are financially-constrained domestically should be affected more when a large portion of cash is held overseas. We find that foreign cash is valued at a discount only when firms have more difficulty raising external capital domestically (have low bond ratings). This finding also helps explain why firms do not simply borrow to alleviate this friction. While firms like Apple have, many firms are not in a position to do so.

To assess whether heightened free cash flow problems contribute to the discount, we investigate whether strong corporate governance mitigates it. Using industry competition and CEO ownership as measures of governance, we find that the discount is mitigated both for firms with greater CEO ownership and for those operating in more competitive industries. These results suggest that part of the valuation discount of foreign cash is driven by the agency problems at MNCs. To provide more direct evidence on the free cash flow hypothesis, we also evaluate MNCs' acquisition decisions as one specific channel of empire building and rent extraction. We find that firms with a higher proportion of cash held overseas experience significantly lower announcement-period abnormal returns when they make cross-border acquisitions. However, these firms' foreign cash ratios have no material impact on their announcement-period abnormal returns when they undertake acquisitions in the domestic market. These findings support our conjecture that cash held abroad is more prone to the misuse by managers.[7]

A potential issue that could cloud our inference is that not all MNCs disclose their foreign cash amount. As a result, our analysis based on the sample of firms that make voluntary disclosures on foreign

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[7] Hanlon, Lester and Verdi (2014) provide a focused examination of foreign acquisitions and also find that foreign cash is associated with worse foreign acquisitions.

cash could be subject to a sample selection bias. We employ two approaches to address this concern. First, we follow Heckman (1979) and repeat our value-of-cash regressions in a two-stage framework to correct for potential selection bias due to the non-randomness of our sample. Since MNCs with more aggressive tax planning are more likely to draw regulators' attention and face more pressure to disclose details about their foreign cash holdings, we use a company's three-year average effective tax rate, a measure of its tax aggressiveness, to predict its decision to disclose foreign cash amount. We then construct the inverse Mills ratio based on the first-stage regression results and include it in the second-stage value-of-cash regressions. We find that the negative effect of foreign cash ratio on marginal value of cash continues to be significant.

Our second approach to address the sample selection issue is to expand the sample back to 1997 and construct an indirect proxy for a firm's foreign cash holdings, i.e. its amount of permanently reinvested earnings (PRE). Firms are required to disclose their PRE amount under Accounting Standards Codification (ASC) 740 and therefore the use of this larger sample is not subject to selection concerns. We first validate PRE as a proxy for foreign cash by showing a high correlation (0.53) between PRE/Asset and a firm's foreign cash ratio for the sample where both measures are available.[8] We then re-estimate the value-of-cash regression using PRE/Asset as a proxy for its foreign cash percentage. The regression results based on this larger sample indicate that the PRE ratio is negatively associated with the market value of cash and confirm the findings based on foreign cash measured directly.

We also use this larger sample to investigate how the passage of the American Jobs Creation Act of 2004 (AJCA) affects the foreign cash valuation discount. The passage of AJCA in 2004 serves as an exogenous regulatory shock that significantly but temporarily reduced the MNCs' tax liabilities when they repatriate accumulated foreign cash. We find that the negative effect of PRE on the value of cash exists during the period before and after the tax holiday, but is significantly attenuated during the tax holiday period. The findings suggest that shareholders alter their perceptions towards undistributed

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[8] The correlation between the dollar amount of PRE and the dollar amount of foreign cash is 0.81 and highly significant.

foreign cash and that their concerns over parent firms' liquidity condition in the domestic market and the agency problems associated with the use of foreign cash are mitigated when foreign cash can be repatriated in a tax-efficient way.

To shed further light on the channel through which offshore cash holdings distort a firm's investment in the domestic market, we follow Fazzari, Hubbard and Petersen (1988) and estimate the domestic investment-cash flow sensitivity using the PRE sample. If the current tax system distorts a firm's internal capital market, we would expect its investment in the domestic market to be significantly and positively associated with the availability of its domestic cash flows when a large portion of its cash reserves are trapped overseas. However, domestic investment should be less sensitive to foreign cash flows because of the high costs of repatriating foreign cash. Consistent with these conjectures, we find that a firm's domestic investment is only sensitive to its domestic cash flows while insensitive to its foreign cash flows. More importantly, the sensitivity of domestic investment to domestic cash flows is more pronounced when firms have a larger portion of total cash reserves trapped overseas. We also show that cash reserves are less useful in mitigating the negative impact of the recent financial crisis on corporate investment when a large portion of these reserves are trapped in foreign countries. Overall, these findings suggest that holding substantial cash abroad may impair the functioning of a firm's internal capital market and reduce its financial flexibility at the parent company, leading to more financial constraints and underinvestment problems in the domestic market.

Our study contributes to the extant research on corporate cash holdings and the market value of cash. Foley et al. (2007) offer a novel tax-based explanation for the cash balances of U.S. firms beyond the traditional transaction-based and agency views of cash holdings. We complement their study by examining the valuation consequence of holding a significant amount of cash abroad. Faulkender and Wang (2006) estimate the value of an additional dollar of cash and find that the value can be affected by corporate financial policies. Dittmar and Mahrt-Smith (2007) and Masulis, Wang, and Xie (2009) suggest that corporate governance has an important impact on the value of cash holdings. Denis and

Sibilkov (2010) find that a firm's cash is more valuable when external financing is costly. All these studies treat cash holdings as homogenous within a firm. Our paper complements these studies by showing that the location of a firm's cash reserves, through the frictions it creates in the firm's internal capital market, matters for the valuation of the firm's cash holdings.

A contemporaneous accounting study by Campbell, Dhaliwal, Krull, and Schwab (2014) also examines the valuation consequences of holding cash in foreign countries. Their focus is on developing a way to estimate the amount and specific location (tax jurisdiction) of foreign cash held by a given company. They also document a valuation discount associated with firms' foreign cash holdings and conclude that it is entirely due to the tax liability. Finally, they provide some evidence that more sophisticated investors are able to estimate and discount the foreign component of a firm's reported cash reserves. We are more interested in the variation in this discount due to agency problems and financing frictions. Further, we provide evidence on how foreign cash holdings impact both domestic investment and foreign acquisitions. We find that the negative valuation impact of foreign cash goes beyond the effect of repatriation tax costs and is also caused by the distortion of a company's internal capital market and the heightened agency costs. Our back-of-the-envelope calculations suggest that about 37% of the discount comes from agency costs, 38% from domestic underinvestment, and 25% from the tax liability.

The remainder of the paper is organized as follows. Section 2 discusses sample construction and research design. Section 3 reports empirical results. We conclude in Section 4.

2. Sample construction and research design

2.1 Sample construction

We start the sample construction with all firms that were constituents of the S&P 1500 indices at any point during the period between 1997 and 2012.[9] To ensure that firms have significant foreign

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[9] Our sample period starts from 1997 because we need to obtain the information on PRE that is disclosed in firms' 10-K filings. The SEC began to require all domestic public firms to submit filings via EDGAR (the Electronic Data-Gathering, Analysis, and Retrieval system) in 1996.

operations, we further require that firms have foreign income taxes (TXFO) greater than or equal to $1 million in any single year during the sample period. We exclude firms that are incorporated outside the U.S. since the U.S. repatriation tax costs do not apply to them. Following the previous literature, we also exclude financial firms (SIC codes 6000 to 6999) and utility firms (SIC codes 4900 to 4999) since these firms are regulated. We obtain financial information from COMPUSTAT and stock price and return data from CRSP.

2.2 Foreign cash measures

Our main measure of foreign cash holdings is the proportion of a firm's total cash that is held abroad. This variable is intended to capture the likelihood that a marginal dollar of a firm's cash is foreign. Firms started to voluntarily disclose the amount of cash held outside the U.S. in their 10-K filings recently, and the number of firms disclosing such information has been increasing significantly since 2010 (Mott and Schmidt, 2011). Therefore, we manually search for the amount of cash held overseas in each firm's 10-K filings for the period between 2010 and 2012. Our final sample in which the foreign cash ratio is available consists of 389 unique firms and 657 firm-year observations. We present an example of how firms disclose their foreign cash amount in Appendix A.

Our second measure is the amount of a firm's permanently reinvested earnings (PRE) scaled by its book value of total assets. If a firm wants to utilize the Indefinite Reversal Exception, it has to disclose in its financial statements the cumulative amount of foreign undistributed earnings for which no expected taxes of repatriation are recorded, as well as the associated incremental tax if those earnings are no longer permanently reinvested. To obtain a firm's PRE amount, we use a PERL script to scan each firm's 10-K filings for variants of "permanently (re)invest(ed)", "indefinitely (re)invest(ed)", "undistributed", "unremitted", and "unrepatriated". We then read the relevant extracted paragraphs and manually collect

the PRE disclosure amount.[10] The final sample in which the PRE measure is available consists of 1,263 unique firms and 12,209 firm-years for the period between 1997 and 2012. Appendix A also contains an example of firms' PRE disclosure.

2.3 Research design

To investigate how a firm's foreign cash ratio affects its market value of cash, we employ the model developed by Faulkender and Wang (2006). The basic intuition of the model is to calculate to what extent a one-dollar increase in a firm's cash holdings results in an increase in shareholder wealth after controlling for changes in other firm-specific variables that also affect shareholder value. Specifically, we estimate the following regression.

$$r_{i,t} - R_{i,t}^B = \beta_0 + \beta_1 \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} + \beta_2 \times ForeignCashRatio_{i,t} \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}}$$

$$+ \beta_3 \times ForeignCashRatio_{i,t} + \gamma^{'} X + \varepsilon_{i,t}$$

The dependent variable is a firm's excess stock return over the fiscal year. It is calculated as $r_{i,t}$, the raw stock return of firm i during fiscal year t, minus $R_{i,t}^B$, the benchmark return during the same time period. Following Faulkender and Wang (2006), we use the value-weighted portfolio return of Fama-French 25 portfolios formed on size and book-to-market at the beginning of the fiscal year as the benchmark return. We also follow Masulis et al. (2009) and use Fama-French 48 industry portfolio return as the benchmark return.[11] As a robustness check, we also use a firm's raw stock return during the fiscal year as the dependent variable while controlling for Fama-French portfolio-year fixed effects or industry-

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[10] For a very small portion of firms that only report the incremental tax instead of the exact amount of PRE, we estimate the amount of PRE as the incremental tax divided by U.S. statutory tax rate following Faulkender and Peterson (2012), though excluding these firms from the sample leaves our results unchanged.
[11] The portfolio return data are obtained from Kenneth French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

year fixed effects. The key independent variable is the change in a firm's cash holdings during year t scaled by the firm's market value of equity measured at the beginning of year t. Its coefficient can be interpreted as the dollar change in shareholder value associated with a one dollar change in corporate cash holdings. We also interact the change in cash holdings with our foreign cash measures. If a firm's foreign cash ratio has a negative effect on the market value of cash, then we expect a negative coefficient for the interaction term.

Following Faulkender and Wang (2006), we control for changes in other firm-specific variables that may be correlated with both a firm's stock performance and its cash policy. Specifically, we control for changes in profitability ($E_{i,t}$), investment policy ($NA_{i,t}$ and $RD_{i,t}$), and financing behaviors ($I_{i,t}$, $D_{i,t}$, $L_{i,t}$ and $NF_{i,t}$), all of which are expected to jointly affect shareholder wealth and cash holdings. We also control for an interaction term between the level of total cash holdings and the change in cash, since firms with a large balance of foreign cash could hold more cash in aggregate and hence the β_2 may simply capture the effect of the level of total cash on the marginal value of cash. We further control for the interaction term between leverage and change in cash as Faulkender and Wang (2006) document that the marginal value of cash is lower when a firm has a higher leverage ratio. Continuous variables are winsorized at the 1st and 99th percentiles of their distributions to mitigate the influence of outliers. Finally, we control for year and Fama-French 48 industry fixed effects in all regressions when the dependent variable is either size and book-to-market adjusted returns or industry-adjusted returns. Detailed variable definitions are given in Appendix B.

3. Empirical results

3.1 Summary statistics for the foreign cash sample

In Panel A of Table 1 we present summary statistics for the sample where the foreign cash ratio is available. The mean (median) book value of assets for our sample firms is $10,967 ($3,232) million. The average (median) firm holds $1,430 ($185) million or 58.8% (60.7%) of its total cash holdings outside the

U.S. As for the other variables, their summary statistics are comparable to those reported in previous studies on the market value of cash. For example, the average (median) one-year abnormal return is -0.4% (-2.1%), which is broadly consistent with the -0.5% (-8.45%) reported in Faulkender and Wang (2006). The sample mean (median) of the tax cost of repatriation (scaled by assets) using statutory tax rate is 0.007 (0.003), compared with 0.003 (0) in Foley et al. (2007). In Panel B of Table 1 we present the means of the dollar amount of foreign cash and foreign cash ratio for each of the Fama-French 12 industries. Although the dollar amount of foreign cash has large variations across different industries, foreign cash ratio for most industries falls between 0.5 and 0.7, with the healthcare industry having the highest ratio, 0.673. We note that while the most public examples of foreign cash are in the business equipment and health (pharmaceutical) industries, the ratios are actually quite tightly distributed and high across almost all industries.

3.2 Foreign cash and the market value of cash: baseline results

Table 2 presents results from the value-of-cash regressions based on the smaller sample where foreign cash amount is disclosed. We report p-values in parentheses that are based on robust standard errors adjusted for firm-level clustering. Column (1) reports the results based on size and book-to-market adjusted stock returns while column (2) presents results with Fama-French 48-industry adjusted returns as the dependent variable. Since demeaning the dependent variable may produce inconsistent estimates (Gormley and Matsa, 2014), we also use a firm's raw stock return during the fiscal year as the dependent variable and control for Fama-French-25-portfolio-year fixed effects and Fama-French-48-industry-year fixed effects in column (3) and (4), respectively.

For the foreign cash measure, we use the continuous foreign cash ratio, defined as the dollar amount of foreign cash divided by the dollar amount of a firm's total cash. The coefficients of the interaction between the foreign cash ratio and the change in cash in all four columns are negative and significant, suggesting that investors increasingly discount the value of a firm's cash holdings as the firm

retains a larger portion of its cash in overseas operations. In terms of economic significance, using the coefficient estimates reported in column (1), we find that the value of cash decreases by $0.49 with a one standard deviation increase in the company's foreign cash ratio. In the following subsections, we investigate the channels through which foreign cash holdings negatively affect the valuation of a firm's cash.

3.3 Repatriation costs

The primary reason why multinational firms retain so much cash in foreign operations is the substantial tax liability associated with repatriating foreign cash. Consistent with the argument, Foley et al. (2007) find that repatriation tax burdens significantly increase a MNC's foreign cash holdings but have an insignificant effect on its domestic cash holdings. Based on this argument, we hypothesize that an important channel of the foreign cash valuation discount is the high repatriation tax costs imposed by the tax law. Specifically, the tax costs associated with repatriation limit firms' access to foreign cash and make it difficult for MNCs to use foreign cash for domestic investments. As such, shareholders assign a lower value to a firm's cash holdings when a larger portion is kept outside the U.S. Therefore, we expect such valuation discount to be much smaller when firms face relatively lower repatriation costs.

To test this conjecture, we estimate the potential tax cost of repatriating foreign cash for each firm in our sample and then split the whole sample based on whether the repatriation tax costs are above or below sample median. Note that MNCs display large cross-sectional heterogeneity in their tax burdens associated with repatriating foreign cash due to different tax environments of the jurisdictions where they have operations and also different balances of unused tax credits. While the data on these items are not publicly available, Foley et al. (2007) observe them using private BEA data and use COMPUSTAT data to construct proxies for companies' repatriation tax costs. We follow the approach in Foley et al. (2007) and estimate each firm's repatriation tax cost for each fiscal year. Specifically, we subtract the amount of foreign taxes a firm has already paid abroad from the total amount of taxes that would be owed on its

foreign pre-tax income and then scale this difference by its book value of total assets.[12] The regression results based on these subsamples are presented in Panel A of Table 3. For the sake of brevity, we only report the results where we use size and book-to-market adjusted stock returns as the dependent variable for the split-sample analyses. All our findings are robust to using the industry-adjusted returns or raw returns as the dependent variable.

In columns (1) and (2) we partition the whole sample based on whether a firm's repatriation cost is below the sample median or above the sample median, while in columns (3) and (4) we split the sample based on whether a firm's repatriation cost is zero or positive. The results show that the negative association between the value of one extra dollar of cash and the foreign cash ratio is only significant when repatriation tax costs are positive or above the sample median. The differences in the coefficients between the subsamples are also statistically significant. For example, the two-sided p-value for the test of difference in the coefficients between column (1) and (2) is 0.045, while the two-sided p-value for the test of difference in the coefficients between column (3) and (4) is 0.020. These findings support our prediction that high tax burdens of repatriating foreign cash limit firms' access to foreign cash when it is needed in the domestic market and thus result in a lower valuation of cash by shareholders.

A natural question that immediately arises is whether the valuation discount is solely caused by the repatriation tax costs. Using the coefficient estimates in column (1) of Table 2, we find that the marginal value of cash decreases from $1.53 to $0.62 when its foreign cash ratio moves from the first quartile to the third quartile of the sample distribution. The large economic magnitude of the valuation discount assigned by shareholders cannot be merely explained by the repatriation tax costs even if we assume a zero taxation environment of foreign operations. In the following sections, we evaluate explanations other than the repatriation tax costs to offer a more thorough picture of the underlying channels through which foreign cash holdings negatively affect the marginal value of cash. Specifically,

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[12] We use the statutory tax rate when estimating the tax costs of repatriation. In unreported results, we also employ the marginal tax rate by Graham (1996) and find similar results. We thank John Graham for sharing the tax data.

we examine whether offshore cash holdings distort a firm's internal capital market and lead to heightened agency problems associated with the use of foreign cash.

3.4 Domestic liquidity conditions

As the examples of Emerson Electric Co. and Apple Inc. illustrate, holding excess cash outside the U.S. could adversely affect a firm's domestic liquidity conditions when there are profitable investment opportunities in the domestic market. This may lead investors to discount the marginal value of one extra dollar of cash a firm earns from its foreign operations. To test this hypothesis, we investigate whether the negative effect of foreign cash holdings on the market value of cash is more pronounced when a company has to access the domestic capital market at a relatively higher cost. Specifically, we use a firm's long-term bond rating (Gilchrist and Himmelberg, 1995; Almeida et al., 2004) to gauge the ease with which it can access the external debt market in the U.S. We then split the whole sample based on whether a firm has an investment grade rating on one of its outstanding public bonds and estimate the value of cash regressions separately in the two subsamples. The subsample regression results are presented in Panel B of Table 3.

We find that the negative effect of foreign cash on cash valuation is only significant in the subsample of firms that have no investment grade bond rating. The difference in the coefficient between the subsamples is significant with a two-sided p-value of 0.073. These results support our hypothesis that one channel through which foreign cash reduces the market value of cash is the friction created in a company's internal capital market. Absent domestic liquidity sources, constrained firms will have to forgo the tax-timing option and undertake costly repatriation of the foreign cash. Consequently, investors place a larger discount on the value of cash when it is more difficult to raise cash domestically—that is when it has more expensive substitutes for the cash held overseas that is costly to access for capital needs in the domestic market.

3.5 Checks on agency conflicts and shareholder-manager alignment

We have argued that a large amount of cash retained in foreign markets exacerbates the agency conflicts between managers and shareholders, since foreign operations often contribute to more financial and organizational complexity, which in turn increases monitoring costs for both boards of directors and outside shareholders. To test this hypothesis, we investigate whether strong governance mechanisms mitigate the heightened agency problems and thus attenuate investors' discount of the value of cash.

Shleifer and Vishny (1997) argue that product market competition could be the most powerful governance mechanism to improve economic efficiency. Giroud and Mueller (2011) document that product market competition, among other external governance mechanisms, plays a vital role in reducing managerial slack and enhancing firm performance. Following these studies, we use product market competition as a measure of the degree of constraint on agency conflicts. Because intensive competition in the product market can constrain managers from misusing excess foreign cash for their private benefits, the negative effect of foreign cash on the market value of cash should be less pronounced when firms operate in more competitive industries. We use the Herfindahl Hirschman index (HHI) to measure the competitive nature of an industry. Specifically, HHI index is calculated as the sum of squared market shares of all COMPUSTAT firms for each Fama-French 48 industry. For each year, we define an industry as competitive if the industry's HHI is below the sample median in that year. We then partition the sample based on whether firms operate in competitive industries or not. The subsample regression results are presented in Panel C of Table 3.

Column (1) reports the regression results for firms operating in more competitive industries and column (2) presents the results based on the subsample of firms in less competitive industries. Consistent with our expectation, the negative effect of foreign cash on cash valuation is no longer significant in the subsample of firms that operate in more competitive industries. However, the negative effect continues to hold in the subsample of firms from less competitive industries. The difference in the coefficient between the subsamples is significant with a two-sided p-value of 0.084.

We also examine whether the valuation discount depends on the extent to which the interests of managers and those of shareholders are misaligned. We expect the valuation discount to be larger when managers' interests are less aligned with those of shareholders. To test this conjecture, we obtain from Execucomp the total percentage of ownership held by the CEO and partition the whole sample based on whether CEO ownership is above or below the sample median. The subsample regression results are presented in columns (3) and (4) of Panel C in Table 3. The results show that the negative effect of foreign cash ratio on the marginal value of cash is concentrated in the subsample of firms where managers hold a smaller equity stake in their companies. The difference in the coefficients between the subsamples is also significant with a two-sided *p*-value of 0.044. Overall, the results reported in this section support our conjecture that part of the cash valuation discount comes from the heightened agency problems created by the large amount of cash held abroad and strong corporate governance and better manager-shareholder alignment can mitigate these agency conflicts and help reduce the cash valuation discount.

3.6 Correcting sample-selection bias

Although the Securities and Exchange Commission (SEC) has been pushing more firms to disclose the exact amount of cash they hold overseas,[13] companies are still not subject to any binding requirement to disclose such information. Since a firm's decision to disclose foreign cash holdings is likely non-random, our analysis based on the foreign cash sample could be subject to a sample selection bias.[14] To address this issue, we follow Heckman (1979) and repeat our main analysis in a two-stage framework to correct for potential selection bias due to the non-randomness of our sample.

Since the major tension between regulators and MNCs on the disclosure of offshore cash holdings comes amid concerns over MNCs' growing aggressiveness in sheltering income from U.S. taxation, we use proxies that capture companies' tax aggressiveness to predict the propensity of a company to disclose

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[13] Helen Thomas, "SEC seeks offshore cash disclosure", Financial Times (September 19, 2011).
[14] Firms are required to disclose the amount of permanently reinvested earnings under the Indefinite Reversal Exception defined in FASB ASC 740. Therefore, our results using the PRE sample are not subject to the selection bias due to sample non-randomness.

its foreign cash amount. Specifically, we use a company's average effective tax rate (TXT/PI) over the past three years to capture its tax aggressiveness (Hanlon and Heitzman, 2010) and estimate a probit regression on firms' decisions to disclose foreign cash amount. The dependent variable of this probit regression is equal to one if a firm discloses the amount of foreign cash in its annual report and zero otherwise. The key independent variable in the probit model is a firm's three-year average effective tax rate with a lower value corresponding to more aggressive tax avoidance. We also control for other firm-level characteristics, including size, profitability, total cash holdings (scaled by book value of total assets), asset tangibility, leverage, Tobin's Q, and foreign income tax (scaled by book value of total assets).

Panel A of Table 4 reports the coefficient estimates of the probit model. The coefficient of the three-year average effective tax rate is negative and significant, supporting our conjecture that firms engaging in more aggressive tax avoidance are subject to more pressure from regulators and thus more likely to disclose detailed information on their offshore cash holdings. We also find that larger and more profitable companies are more likely to disclose their foreign cash holdings, while firms with more tangible assets are less likely to do so. Finally, firms with a larger cash balance and higher foreign income taxes are more likely to report their offshore cash holdings.

Panel B of Table 4 reports the results from the second-stage value-of-cash regression where we include the inverse Mills ratio estimated from the first-stage probit model as an additional explanatory variable. We find that the coefficient of the inverse Mills ratio is insignificant at conventional levels. More importantly, the negative impact of foreign cash on the marginal value of cash holdings remains highly significant in all four model specifications, indicating that our results are robust to correcting for potential sample selection bias.

3.7 Using PRE as a measure of foreign cash holdings

In this subsection, we use the amount of a firm's permanently reinvested earnings (PRE) as a proxy for the firm's foreign cash holdings. While PRE is an indirect proxy for a firm's cash held abroad,

using PRE allows us to examine a greater number of firms that span a longer time period since companies are required to disclose the balance of PRE in their financial statements. In the regression analysis, we use a firm's PRE scaled by its book value of total assets, which is available for 1,263 unique firms and 12,209 firm-years for the period between 1997 and 2012. The summary statistics for these firms are presented in Panel A of Table 5. The average company in our sample designates $862 million or 8% of total assets as permanently reinvested earnings. Both numbers are broadly consistent with the statistics reported in Blouin, Krull, and Robinson (2014).

To validate the use of PRE as a proxy for foreign cash holdings, we calculate the correlations between PRE (or PRE/Asset) and foreign cash holdings (or Foreign Cash/Total Cash) for firms with both proxies available and report these statistics in Panel B of Table 5. We find that PRE (both amount and ratio) is highly correlated with foreign cash holdings. Specifically, the correlation between the dollar amount of PRE and foreign cash holdings is 0.81, while the correlation between PRE/Asset and the foreign cash ratio is 0.53, both of which are statistically significant at the 0.01% level.

We reestimate the value-of-cash regressions using PRE/Asset as our foreign cash measure and report these results in Table 6. In column (1) we use 25 size and book-to-market portfolio returns as the benchmark return to calculate excess returns, while in column (2) we use Fama-French 48-industry portfolio returns. In columns (3) and (4), the dependent variable is a firm's raw stock return. The coefficient estimates of the interaction between the change in cash and PRE/Asset are negative and statistically significant in all four columns, suggesting that the negative effect of foreign cash holdings on cash valuation continues to hold in this larger sample.

Another advantage of using this larger sample is that we can investigate how the American Jobs Creation Act of 2004 alters the effect of foreign cash holdings on cash valuation. In view of the rapidly growing stockpiles of unrepatriated foreign earnings, the AJCA was introduced and discussed in 2003 and finally signed into law by President Bush on October 22, 2004 to encourage domestic investment and

employment.[15] The Act creates a one-time tax holiday for MNCs to repatriate undistributed foreign earnings at an unusually low tax cost. Under the Act, 85% of the repatriated earnings can be exempt from additional U.S. taxes, resulting in a significant tax rate reduction from a maximum of 35% to 5.25%. The Act offers an exogenous regulatory shock that significantly reduced the repatriation costs during the period of tax holiday. We expect that both the adverse effect of foreign cash holdings on domestic liquidity conditions and the free cash flow problem are temporarily alleviated since MNCs can repatriate their foreign cash at a significantly lower cost. If this is the case, the negative effect of foreign cash holdings on the market value of cash should be attenuated during the tax holiday period. Faulkender and Petersen (2012) document that the majority of repatriations under the Act were conducted in 2005 and 2006. Therefore, we define the tax holiday period as the fiscal years that end in either 2005 or 2006. The pre-tax holiday period is from 2003 to 2004 and the post-tax holiday period includes year 2007 and 2008. We also require that firms have non-missing information on variables used in the value-of-cash regressions for all these six years so that we follow the same firms for each of the three periods. We then estimate the value-of-cash regressions separately for the time periods before the tax holiday, during the tax holiday, and after the tax holiday and present the results in the each of the three columns in Table 7.

Consistent with our conjecture, the coefficient estimates of the interaction between PRE/Asset and the change in cash holdings are negative and statistically significant for both pre- and post-tax holiday periods, but not for the two years during which MNCs can repatriate their foreign cash at a significantly reduced tax rate. The difference in the coefficients of the interaction term (*PRE/Asset*ΔC*) between the pre-holiday (post-holiday) period and tax holiday period is also statistically significant with a p-value of 0.056 (0.068). These results indicate that investors' discount of foreign cash disappears since the problems associated with holding a large amount of cash are corrected as the AJCA enables firms to use their foreign cash without incurring large tax liabilities.

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[15] Part of the Act is also called the Homeland Investment Act (HIA). See Dharmapala, Foley, and Forbes (2011).

3.8 Robustness tests

In this section, we conduct two more sensitivity tests to further confirm the robustness of the negative effect of foreign cash on the market value of cash. First, we control for a measure of a firm's scope of global diversification to address the concern that the negative impact of foreign cash on cash valuation may simply proxy for the global diversification discount (Denis, Denis, and Yost, 2002; Goetz, Laeven, and Levine, 2013). We obtain the geographic segment sales data from COMPUSTAT's segments file and calculate the ratio of foreign sales over total sales as the measure of the extent to which a firm is globally diversified. Following Denis et al. (2002), we exclude firm-years in which the sum of segment sales is not within 1% of a firm's total sales. The regression results are presented in Table 8.

Column (1) is based on the sample where the foreign cash ratio is available, while column (2) reports the results using PRE/Asset. Consistent with the global diversification discount documented in prior studies, the coefficient estimate on the foreign sales ratio itself is negative and significant at the 1% level. More importantly, the coefficient on the interaction term between the foreign cash ratio (or PRE/Asset) and the change in cash remains negative and statistically significant after controlling for firms' global diversification, suggesting that the negative effect of foreign cash holdings on market value of cash is not simply driven by firms' geographic diversification in foreign markets. We note that this evidence has an important implication for the debate over the source of the globalization discount. Rather than being mechanically caused by the repatriation tax liability, it must be the case that any globalization discount comes from another source.

In the second robustness test, we use the value-of-cash model developed by Fama and French (1998) and continue to document a significant discount that investors place on the value of MNCs' foreign cash. These results are presented in Appendix C.

3.9 Domestic investment-cash flow sensitivity

Our results so far have shown that keeping a significant portion of cash abroad results in lower value of cash holdings. In the following subsections, we aim to provide more direct evidence on the channels through which foreign cash holdings negatively affect the market value of cash. We first examine whether holding a significant amount of cash abroad distorts a firm's domestic real investment activity. When the external capital market is frictionless, a firm can finance and undertake all positive-NPV projects and thus its investment decisions would be independent of its liquidity conditions (Myers and Majluf, 1984). However, companies may deviate from their optimal investment decisions when they are financially constrained due to frictions such as information asymmetry, moral hazard, or incomplete contracting. In an influential paper, Fazzari, Hubbard and Petersen (1988) propose the idea that a firm's investment depends on the availability of internal funds when they face financial constraints, i.e. a significant and positive sensitivity of investment to cash flow. In our setting, the current tax system introduces another layer of friction within a firm's internal capital market and renders it very costly to fund its domestic investment with foreign cash. As a result, we would expect the level of a firm's investment in the domestic market to be significantly and positively associated with the availability of its domestic cash flow when a significant portion of its financial slack is trapped abroad. However, domestic investment should be insensitive to the availability of foreign cash flow.

To empirically test these predictions, we use the COMPUSTAT geographic segment data and estimate the domestic investment-cash flow sensitivity as follows.

$$\frac{DI_{i,t}}{DAT_{i,t}} = \alpha_i + \alpha_t + \beta_1 \times \frac{DCF_{i,t}}{DAT_{i,t}} + \beta_2 \times \frac{FCF_{i,t}}{FAT_{i,t}} + \beta_3 \times Q + \varepsilon_{i,t}$$

Where $DI_{i,t}$ is a firm's domestic investment, defined as the difference between its total capital expenditure (CAPX) and the capital expenditure reported under foreign segments. Similarly, a firm's domestic cash flow, $DCF_{i,t}$, is equal to its total cash flow minus its foreign cash flow ($FCF_{i,t}$), where cash flow is defined as the sum of earnings before extraordinary items (IB) and depreciation and amortization

(DP). We scale both domestic investment and domestic cash flow with domestic assets, $DAT_{i,t}$, measured as total assets (AT) minus the assets reported under foreign segments. Similarly, we scale foreign cash flow with foreign assets. Following the investment literature, we control for Tobin's Q measured as the ratio of market value of assets to book value of assets in the regression to proxy for firm-level investment opportunities. We also control for firm-fixed effects (α_i) and year fixed-effects (α_t) to account for firm-specific heterogeneity and time trend. After matching our PRE sample with the COMPUSTAT geographic segment database and requiring that firms have available PRE, we have 809 firm-years left that have non-missing information on foreign capital expenditure, assets, and cash flows.

The regression results are presented in Table 9. The coefficient estimates reported in column (1) indicate that domestic investment is significantly sensitive to domestic cash flow. However, the coefficient estimate for foreign cash flow suggests that domestic investment is insensitive to foreign cash flow.

To shed further light on the impact of trapped cash on the domestic investment-cash flow sensitivity, we split the sample based on whether a firm's PRE/Asset is above the sample median or below the sample median and then estimate the regression separately on the two subsamples. The results indicate that a firm's domestic investment is more sensitive to the availability of domestic cash flow when it has a higher proportion of cash trapped overseas, as evidenced by the different magnitude of the coefficient estimates of domestic cash flow in column (2) and (3). The two-sided test of difference in the coefficients between the two subsamples indicates that they are significantly different from each other with a p-value of 0.026. Overall, these findings suggest that holding more of its cash abroad may reduce a firm's financial flexibility at the parent company and hence lead to more financial constraints and underinvestment problems in the domestic market. As such, shareholders place a discount on the value of its cash holdings.[16]

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[16] Firms may have ways to mitigate the internal capital market distortion caused by repatriation taxes. For example, companies can borrow domestically against their foreign cash. But this would be subject to a firm's available debt capacity and marginal cost of borrowing. Our split-sample analysis based on companies' bond ratings does show that the negative effect of foreign cash on internal market efficiency is less pronounced when the cost of borrowing

3.10 *Trapped cash and investment during the financial crisis*

In this section, we conduct another test to provide further evidence on how foreign cash holdings distort a firm's internal capital market. Specifically, we follow Duchin, Ozbas, and Sensoy (2010) and examine the impact of the recent financial crisis on corporate investment. Duchin et al. (2010) document a significant decline in corporate investment after the onset of the financial crisis and show that the decline is less pronounced for cash-rich firms since these firms can continue to fund positive NPV projects with their financial slack. We expect a company's cash reserves to be less useful in mitigating the negative impact of the financial crisis on corporate investment when a large portion of these cash reserves are subject to repatriation taxes.

To test this conjecture, we first estimate a firm fixed-effects regression and examine whether corporate investment declines significantly after the onset of the crisis. Following Duchin et al. (2010), we use quarterly data from July 1, 2006 to June 30, 2008 and regress corporate investment on an indicator for the period after the crisis begins (July 1, 2007-June 30, 2008) while controlling for Tobin's Q, cash flow, and firm-fixed effects. The results from this regression are shown in column (1) of Table 10. The dependent variable is a firm's quarterly investment (CAPXY) scaled by book value of total assets (ATQ). Consistent with Duchin et al. (2010), we find that the indicator for the post-crisis period, *After*, has a negative and significant coefficient estimate. However, the decline in investment is less significant for cash-rich firms, as evidenced by the positive coefficient on the term interacting *After* and the company's total cash reserves.[17] We then partition the full sample based on whether the company's PRE/Asset is above or below the sample median and estimate the same regression separately in these two subsamples. We find that the coefficient estimate of *After* is negative and significant in both subsamples. However, the coefficient estimate for the interaction term between *After* and the company's total cash reserves is

is lower. Firms can also borrow from their foreign subsidiaries. However, according to the IRS rules, these loans must be short term and hence are more likely to be used as working capital than to fund long-term investment. See a discussion by Kate Linebaugh, "How Firms Tap Overseas Cash?", the Wall Street Journal (March 28, 2013).

[17] We use a firm's total cash holdings measured at the fiscal quarter immediately prior to July 1, 2006, since Duchin et al. (2010) point out that contemporaneous cash holdings may be endogenous to corporate investment opportunities.

positive and only significant in the subsample of firms with low PRE/Asset and the difference in the coefficients between the two subsamples is significant with a p-value of 0.032. These results indicate that cash is less useful in mitigating the negative impact of the crisis on corporate investment when a large portion of cash is subject to costly repatriation tax due to being held overseas.

3.11 *Foreign cash and acquisitions in foreign markets*

Our analysis of the cross-sectional variation in the effect of foreign cash holdings on the value of cash also indicates that one potential explanation of such negative effect is the heightened agency issues associated with the use of foreign cash. Specifically, we have shown that the negative effect of foreign cash holdings on the market value of cash is significantly attenuated when MNCs are subject to discipline from product market competition or when managers' interests are more closely aligned with those of shareholders. To provide more direct evidence in support of the free cash flow hypothesis, in this subsection we examine whether firms with more foreign cash holdings are more likely to use their foreign cash to make cross-border acquisitions that destroy shareholder value.

We obtain U.S. companies' acquisitions of foreign targets from the SDC International Mergers and Acquisitions database. We require that the deal value be at least $1 million and acquirers aim to own over 50% of the target after the transaction. We exclude deals in which acquirers exclusively use stock as the method of payment. Our final sample consists of 68 foreign acquisitions announced in 2011 and 2012 for firms that disclose their foreign cash amount, and 653 transactions announced during the period of 1997-2012 for firms with available PRE.

The average three-day cumulative abnormal returns (CAR1) using the market model is 0.6% (0.5%) for the foreign cash (PRE) sample. For robustness, we also follow Bao and Edmans (2011) and calculate market-adjusted three-day cumulative abnormal returns (CAR2) where the market return is the CRSP value-weighted return. It has a mean (median) of 0.8% (0.3%) for acquirers that disclose their foreign cash amount, and 0.6% (0.2%) for acquirers that have available information on PRE.

In Panel A of Table 11, we partition the 68 foreign acquisitions based on acquirers' foreign cash ratio. Acquirer CARs are positive and significantly different from zero when acquirers' foreign cash ratio is below the sample median, while CARs are negative and statistically indistinguishable from zero when acquirers' foreign cash ratio is above the sample median. These differences are statistically significant at the 5% level. Therefore, the univariate comparison suggests that firms with more foreign cash indeed tend to make foreign acquisitions that result in lower shareholder value.

To control for other known determinants of bidder returns, we estimate an OLS regression with acquirer CARs as the dependent variable. Consistent with prior studies on acquirer returns (Masulis, Wang, and Xie, 2007), we include both acquirer characteristics and deal feature variables as control variables. The acquirer characteristics we control for are firm size, Tobin's Q, leverage ratio, and free cash flow, all of which are measured at the fiscal year end immediately prior to the acquisition announcement. The deal characteristics we control for include the industry relatedness of an acquisition (a dummy for diversifying acquisitions) and the listing status of a target (whether a target is a public firm or a private company). We also control for target-country fixed effects to address the possibility that some unobserved country-level differences may affect acquirer returns. Finally, we control for acquirer industry fixed effects and year fixed effects. The regression results are presented in Panel B of Table 11. Columns (1) and (2) report the coefficient estimates based on acquisitions by firms that disclose their foreign cash amount, while columns (3) and (4) report the results based on the larger sample where we have information on acquirer PRE. Consistent with the findings from the univariate comparison, the coefficient estimate of foreign cash measures (either foreign cash ratio or PRE/Asset) is significant and negative in all four specifications. The economic magnitude of the negative effect on bidder returns is also meaningful. For example, a one standard deviation increase in foreign cash ratio is associated with a reduction in CAR1 by 1.5%. Given the fact that our sample firms are on average large multinational corporations, this translates into $258 million loss of shareholder value for the average bidder.[18] These

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[18] These results are broadly consistent with Hanlon, Lester and Verdi (2014).

results lend strong support to our hypothesis that foreign cash held overseas may be misspent by managers and in turn investors place a discount on the market value of that cash.

In further analysis, we conduct a falsification test by investigating the effect of foreign cash holdings on domestic acquisition performance. The reason is that the negative impact of foreign cash on acquirer returns around the announcement of foreign acquisitions may simply capture some unobserved firm or managerial characteristics that are responsible for both the high foreign cash holdings and the lower returns from acquisitions. One such variable, for instance, could be the quality of managers. Low-quality managers may prefer to keep most of their companies' cash in foreign markets since the use of these cash reserves may be subject to less monitoring from boards of directors or shareholders. At the same time, these managers are more likely to make empire-building acquisitions that destroy shareholder value. If this is the case, we should expect that firms with high levels of foreign cash holdings are also more likely to make bad acquisitions in the domestic market. To test this conjecture, we obtain domestic acquisitions made by our sample firms and conduct both univariate and multivariate analyses for these domestic transactions. The results are presented in Table 12.

In the univariate comparison in Panel A of Table 12, we find no significant differences in returns between acquirers with a high foreign cash ratio and those with a low foreign cash ratio. Moreover, in the multivariate regressions, the coefficient on foreign cash ratio (or PRE/Asset) is never significantly different from zero. These results suggest that the negative effect of foreign cash holdings on foreign acquisition performance is not driven by some unobserved factors, but reflects the heightened agency problems resulting from keeping a large amount of cash outside the U.S.

4. Conclusions

Prior studies have documented that the tax burdens associated with repatriating foreign cash create incentives for U.S. multinational firms to retain substantial cash abroad. The issue is further exacerbated by the special accounting treatment under the Indefinite Reversal Exception that encourages

firms to designate their foreign earnings as permanently reinvested to avoid accounting income tax expenses. In this study, we investigate the shareholder value consequence of holding significant cash abroad. In particular, we examine how foreign cash holdings, combined with financing frictions and agency conflicts, can distort the investment policy of the firm, affecting the market value of cash assigned by shareholders.

Using a hand-collected sample of large U.S. MNCs, we find that the percentage of total cash held in foreign markets has a significantly negative impact on the market value of cash. This negative effect is more pronounced when repatriation tax costs are high and when firms are financially constrained domestically. Consistent with the heightened agency problems associated with the use of foreign cash, we find that the negative effect is significantly attenuated when firms operate in more competitive product markets and when CEOs' interests are more aligned with those of shareholders. In further analysis, we show that the American Jobs Creation Act of 2004 significantly mitigates the negative effect by allowing MNCs to repatriate foreign cash at a much lower tax rate. These findings suggest that holding much cash abroad can distort a company's internal capital market, reduce companies' financial and investment flexibility when cash is needed domestically, and intensify the conflicts of interests between managers and shareholders.

In further analysis, we explore the underlying channels through which foreign cash holdings negatively impact a firm's market value of cash. Specifically, we estimate the domestic investment-cash flow sensitivity and find that a firm's domestic investment is only sensitive to its domestic cash flows while insensitive to its foreign cash flows. Moreover, the sensitivity of domestic investment to domestic cash flows is more pronounced when firms have a higher portion of cash trapped overseas. Furthermore, we find that cash reserves are less useful in mitigating the negative impact of the recent financial crisis on corporate investment when a large portion of these reserves are trapped in foreign countries. Finally, the large amount of cash held overseas is also subject to managerial empire building and rent extraction, as our evidence on cross-border acquisitions suggests that firms with more foreign cash holdings are more

likely to make foreign acquisitions that result in lower shareholder value. Overall, our results indicate that holding cash abroad has important economic consequences at the firm-level and these findings should have important policy implications as they add to the debate on the efficiency of the current U.S. tax system.

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Appendix A. Examples of foreign cash and PRE disclosure

The following is an excerpt from Microsoft Corp.'s (CIK: 0000789019) consolidated annual report (10-k) for the fiscal year ending on 30/06/2011. Detailed information can be found at :

http://www.sec.gov/Archives/edgar/data/789019/000119312511200680/0001193125-11-200680-index.htm.

Foreign Cash

"Of the cash, cash equivalents, and short-term investments at June 30, 2011, approximately $45 billion was held by our foreign subsidiaries and were subject to material repatriation tax effects. The amount of cash and investments held by foreign subsidiaries subject to other restrictions on the free flow of funds (primarily currency and other local regulatory) was approximately $379 million."

PRE

"Tax contingencies and other tax liabilities were $7.4 billion and $6.9 billion as of June 30, 2011 and 2010, respectively, and are included in other long-term liabilities. We have not provided deferred U.S. income taxes or foreign withholding taxes on temporary differences of approximately $44.8 billion resulting from earnings for certain non-U.S. subsidiaries because they are permanently reinvested outside the U.S. The unrecognized deferred tax liability associated with these temporary differences was approximately $14.2 billion as of June 30, 2011."

Appendix B: Variable definitions

Variable	Definitions
Foreign Cash	
Foreign Cash (in $mil)	The dollar amount of cash held abroad reported in a firm's annual consolidated SEC filings (10-k).
Foreign Cash Ratio	The ratio of cash held abroad to total cash holdings (CHE).
PRE measures	
PRE (in $mil)	The dollar amount of permanently reinvested earnings reported in a firm's annual consolidated SEC filings (10-k).
PRE/Asset	PRE scaled by book value of total assets (AT).
Variables used in value-of-cash regressions	
ARET25	Abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted benchmark portfolio return, where benchmark portfolios are the Fama-French (1993) 25 size and book-to-market portfolios.
ARET48	Abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted industry returns, where industries are defined based on Fama-French (1997) 48-industry classification.
RET	Raw stock return over the fiscal year.
ΔC	Change in cash plus marketable securities (CHE) over the fiscal year scaled by market value of equity (CSHO $\times$ PRCC) at the beginning of the fiscal year.
ΔE	Change in earnings before extraordinary items (IB + XINT + TXDI + ITCI) over the fiscal year scaled by market value of equity (CSHO $\times$ PRCC) at the beginning of the fiscal year.
ΔNA	Change in net assets (AT – CHE) over the fiscal year scaled by market value of equity (CSHO $\times$ PRCC) at the beginning of the fiscal year.
ΔRD	Change in research and development expenses (XRD or zero if missing) over the fiscal year scaled by market value of equity (CSHO $\times$ PRCC) at the beginning of the fiscal year.

ΔI	Change in interest expenses (XINT) over the fiscal year scaled by market value of equity (CSHO × PRCC) at the beginning of the fiscal year.
ΔD	Change in common dividends (DVC) over the fiscal year scaled by market value of equity (CSHO × PRCC) at the beginning of the fiscal year.
Cash	Cash plus marketable securities (CHE) scaled by market value of equity (CSHO × PRCC) at the beginning of the fiscal year.
Leverage	Total debt over the sum of total debt and the market value of equity: (DLTT + DLC) / (DLTT + DLC + CSHO × PRCC).
NF	Net financing over the fiscal year defined as total equity issuance (SSTK) minus repurchases (PRSTKC) plus debt issuance (DLTIS) minus debt redemption (DLTR).

Variables in the investment analysis

Investment	A firm's capital expenditure (CAPX) scaled by total assets (AT). Domestic investment is measured as the aggregate domestic capital expenditures scaled by domestic assets. Geographic information is obtained from the COMPUSTAT geographic segment file.
Cash flow	Sum of income before extraordinary items (IB) and depreciation and amortization (DP) scaled by total assets (AT). Domestic (Foreign) CF are the domestic (foreign) cash flow measured as the sum of domestic (foreign) income before extraordinary items and depreciation and amortization scaled by domestic (foreign) assets. Geographic information is obtained from the COMPUSTAT geographic segment file.
Tobin's Q	Market value of assets over book value of assets: (AT – CEQ + CSHO × PRCC – TXDB) / AT

Other variables in the acquisition analysis

Free cash flow (FCF)	Operating income before depreciation (OIBDP) – interest expenses (XINT) – income taxes (TXT) – capital expenditures (CAPX), scaled by book value of total assets (AT)
Diversifying	Dummy variable: 1 if bidder and target do not share a two-digit SIC code, 0 otherwise
Public target	Dummy variable: 1 for public targets, 0 otherwise
Private target	Dummy variable: 1 for private targets, 0 otherwise

Appendix C: Using the value-of-cash model developed by Fama and French (1998)

In this section, we adopt a different model specification to examine the impact of foreign cash on the value of cash holdings. Following Fama and French (1998) and Dittmar and Mahrt-Smith (2007), we regress firm value measured by market-to-book ratio on the level of cash holdings and its interaction with foreign cash ratio (PRE/Asset) after controlling for an array of current levels, historic changes, and future changes of firm-specific characteristics as well as year and firm fixed effects. Specifically, we estimate the following regression model:

$$MV_{i,t} = \beta_0 + \beta_1 \times Cash_{i,t} + \beta_2 \times Cash_{i,t} \times ForeignCashRatio \left(or \ \frac{PRE}{Asset} \right) + \beta_3$$
$$\times ForeignCashRatio \left(or \ \frac{PRE}{Asset} \right) + \gamma'X + \alpha_i + \alpha_t + \varepsilon_{i,t}$$

where $MV_{i,t}$ is the market value of firm$_i$ at year t (CSHO*PRCC + LT) scaled by net assets (AT - CHE) and all the control variables are deflated by net assets (AT - CHE). *X* include current levels, two-year lagged changes, and two-year future changes of Earnings, R&D, Dividend, Interest expenses, Net assets (current level not used), and Market value (only future changes). α_i and α_t denote firm fixed effects and year fixed effects, respectively.

The regression results are presented in Panel A of Table C. We find that our foreign cash measures continue to have significant impact on the value of cash, as evidenced by the negative and significant coefficient of (Foreign cash ratio*Cash) or (PRE/Asset*Cash). As an alternative model specification, we break total cash into foreign cash and domestic cash and include them separately in the Fama-French market-to-book regressions. The results presented in Panel B show that foreign cash is valued at a discount relative to domestic cash. More specifically, when we include both total cash and foreign cash in column (1), the coefficient of total cash is positive and significant while the coefficient of foreign cash is negative and significant. When we include both foreign cash and domestic cash in column (2), we find that the coefficient of domestic cash is 3.178 while the coefficient of foreign cash is 1.864 and the difference between these two coefficient estimates is significant with a p-value of 0.037.

Table C. Alternative value-of-cash model: Fama and French (1998) market-to-book regressions

This table presents results from Fama and French (1998) market-to-book regressions. The dependent variable is the ratio of market value to net assets. All control variables are scaled by net assets (AT - CHE). ΔX_t indicates a change in X from year t-2 to t. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. We control for year fixed effects and firm fixed effects in all regressions.

Panel A: Fama and French market-to-book regression

	(1)	(2)
Dependent variable	MV	MV
Cash	3.810***	2.861***
	(0.001)	(0.000)
Foreign cash ratio*Cash	-2.641**	
	(0.045)	
Foreign cash ratio	0.681**	
	(0.017)	
PRE/Asset*Cash		-4.216***
		(0.004)
PRE/Asset		-1.184**
		(0.049)
Earnings	7.360***	2.623***
	(0.000)	(0.000)
ΔEarnings$_t$	0.221	0.679***
	(0.777)	(0.006)
ΔEarnings$_{t+2}$	4.800***	1.578***
	(0.004)	(0.000)
R&D	-1.429	4.558**
	(0.389)	(0.010)
ΔR&D$_t$	6.213**	7.484***
	(0.037)	(0.000)
ΔR&D$_{t+2}$	4.982	10.265***
	(0.214)	(0.000)
Dividend	1.805	4.851***
	(0.603)	(0.002)
ΔDividend$_t$	-7.839	0.271
	(0.139)	(0.924)
ΔDividend$_{t+2}$	-10.861	3.836
	(0.133)	(0.156)
Interest expenses	-3.076	-7.314
	(0.438)	(0.126)
ΔInterest expenses$_t$	-5.075	-10.019***
	(0.532)	(0.000)
ΔInterest expenses$_{t+2}$	20.628***	-7.991**
	(0.002)	(0.013)
ΔNet assets$_t$	0.465*	0.380***
	(0.054)	(0.002)
ΔNet assets$_{t+2}$	-0.206	0.550***
	(0.402)	(0.000)
ΔMV$_{t+2}$	0.425***	-0.197***

	(0.000)	(0.000)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	629	10,692
Adjusted R-squared	0.971	0.799

Panel B: Breaking total cash into foreign cash and domestic cash

	(1)	(2)
Dependent variable	MV	MV
Cash	3.087***	
	(0.000)	
Foreign cash	-1.247*	1.864***
	(0.080)	(0.000)
Domestic cash		3.178***
		(0.000)
Earnings	7.235***	7.317***
	(0.000)	(0.000)
ΔEarnings$_t$	0.207	0.090
	(0.794)	(0.908)
ΔEarnings$_{t+2}$	4.842***	4.824***
	(0.000)	(0.000)
R&D	-1.674	-1.230
	(0.232)	(0.368)
ΔR&D$_t$	6.294*	5.780
	(0.070)	(0.102)
ΔR&D$_{t+2}$	5.301	4.316
	(0.524)	(0.606)
Dividend	2.743	3.070
	(0.329)	(0.279)
ΔDividend$_t$	-8.468	-8.232
	(0.109)	(0.121)
ΔDividend$_{t+2}$	-10.178*	-10.344*
	(0.091)	(0.084)
Interest expenses	-4.667	-3.766
	(0.330)	(0.439)
ΔInterest expenses$_t$	-3.491	-2.796
	(0.573)	(0.652)
ΔInterest expenses$_{t+2}$	18.659	20.229
	(0.186)	(0.164)
ΔNet assets$_t$	0.536**	0.470*
	(0.049)	(0.089)
ΔNet assets$_{t+2}$	-0.263	-0.349
	(0.536)	(0.423)
ΔMV$_{t+2}$	0.459**	0.513**
	(0.020)	(0.012)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	629	629
Adjusted R-squared	0.971	0.970

Table 1. Summary statistics for the foreign cash sample

Panel A presents summary statistics for the foreign cash sample. The initial sample consists of all S&P 1500 firms with foreign income taxes (TXFO) greater than or equal to $1 million during any given year from 1997 to 2012. The foreign cash sample comprises the subset of firm-year observations for which we can obtain the foreign cash information from firms' 10-K filings. Financial firms (SIC code 6000-6999) and utilities (SIC code 4900-4999) are excluded. Panel B presents the summary statistics of foreign cash and foreign cash ratio by Fama-French 12 industries. Detailed variable definitions can be found in Appendix B.

Panel A: Summary statistics

	N	Mean	Std	Q1	Median	Q3
Assets (in $mil)	657	10,967	33,160	1,157	3,232	9,057
Foreign cash (in $mil)	657	1,430	6,183	62	185	580
Foreign cash ratio	657	0.588	0.289	0.333	0.607	0.861
ARET25	657	-0.004	0.312	-0.181	-0.021	0.130
ARET48	657	-0.002	0.299	-0.182	-0.020	0.142
RET	657	0.105	0.356	-0.091	0.087	0.256
ΔC	657	0.002	0.069	-0.022	0.006	0.032
ΔE	657	0.004	0.087	-0.014	0.004	0.022
ΔNA	657	0.057	0.187	-0.002	0.031	0.088
ΔRD	657	0.002	0.006	0.000	0.000	0.004
ΔI	657	0.001	0.006	-0.001	0.000	0.001
ΔD	657	0.001	0.005	0.000	0.000	0.002
Cash	657	0.176	0.164	0.070	0.122	0.230
Leverage	657	0.182	0.158	0.056	0.150	0.269
NF	657	-0.006	0.093	-0.045	-0.016	0.007
Tax costs of repatriation	635	0.007	0.010	0.000	0.003	0.010
Foreign sales ratio	553	0.452	0.222	0.286	0.453	0.596

Panel B: Summary statistics of foreign cash and foreign cash ratio by industry

Industry	Mean of foreign cash (in $mil)	Mean of foreign cash ratio
Consumer Non-Durables	584	0.620
Consumer Durables	234	0.565
Manufacturing	350	0.634
Energy	897	0.654
Chemicals	238	0.633
Business equipment	2,762	0.581
Telecom	447	0.119
Shops	673	0.493
Health	2,560	0.673
Other	1,449	0.490

Table 2. Foreign cash ratio and the value of cash

This table presents the results from the value-of-cash regressions. The dependent variable in column (1) is a firm's abnormal stock return over the fiscal year, calculated as its raw return minus the value-weighted Fama-French (1993) 25 size and book-to-market portfolio return. In column (2), the dependent variable is the Fama-French (1997) 48-industry adjusted abnormal return. In columns (3) and (4), the dependent variable is a firm's raw stock return during the fiscal year. Detailed variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. We control for year fixed effects and industry fixed effects in columns (1) and (2), portfolio-year fixed effects in column (3), and industry-year fixed effects in column (4).

	(1)	(2)	(3)	(4)
Dependent Variable	ARET25	ARET48	RET	RET
ΔC	2.054***	1.840***	1.893***	2.213***
	(0.000)	(0.000)	(0.000)	(0.000)
Foreign Cash Ratio*ΔC	-1.722***	-1.674***	-1.308**	-1.604**
	(0.004)	(0.008)	(0.039)	(0.025)
Foreign Cash Ratio	-0.062	-0.032	-0.122**	-0.054
	(0.113)	(0.422)	(0.024)	(0.198)
ΔE	0.756***	0.719***	0.819***	0.802***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔNA	0.286***	0.335***	0.388***	0.372***
	(0.004)	(0.001)	(0.001)	(0.001)
ΔRD	0.812	0.784	1.252	0.814
	(0.679)	(0.702)	(0.545)	(0.684)
ΔI	-0.481	-0.784	0.243	-2.417
	(0.846)	(0.734)	(0.927)	(0.318)
ΔD	2.848	3.968	4.487*	2.509
	(0.279)	(0.145)	(0.081)	(0.430)
Cash	0.242**	0.261***	0.065	0.275***
	(0.011)	(0.004)	(0.592)	(0.004)
Leverage	-0.366***	-0.334***	-0.350***	-0.344***
	(0.000)	(0.000)	(0.000)	(0.000)
NF	-0.378**	-0.420**	-0.509***	-0.408**
	(0.045)	(0.027)	(0.008)	(0.047)
Cash*ΔC	-0.318	-0.238	-0.161	-0.411
	(0.405)	(0.626)	(0.727)	(0.444)
Leverage*ΔC	0.589	1.181	0.316	0.528
	(0.509)	(0.197)	(0.735)	(0.612)
Observations	657	657	657	657
Year fixed effects	Yes	Yes	No	No
Industry fixed effects	Yes	Yes	No	No
(Portfolio × Year) fixed effects	No	No	Yes	No
(Industry × Year) fixed effects	No	No	No	Yes
Adjusted R-squared	0.285	0.213	0.229	0.341

Table 3. Cross-sectional variation in the effect of the foreign cash ratio on the value of cash

This table presents the subsample analyses on the cross-sectional variations in the effect of the foreign cash ratio on the value of cash. The dependent variable is a firm's abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted Fama-French (1993) 25 size and book-to-market portfolio return. Panel A presents the results on how repatriation tax costs impact the relation between foreign cash ratio and the value of cash. Tax cost of repatriation is calculated by first subtracting foreign taxes paid from the product of foreign pre-tax income and U.S. statutory tax rate, and then the maximum of this difference or zero is divided by total assets. Panel B presents subsample analysis based on whether a firm has an investment grade rating on one of its outstanding public bonds. Panel C presents the results from subsample analyses based on whether a firm operates in a competitive industry (in columns 1 and 2) or whether the CEO's equity ownership is above sample median (in columns 3 and 4). For each year, an industry is defined to be competitive (non-competitive) if its Herfindahl index is below (above) the sample median. Herfindahl index is calculated as the sum of squared market shares of all COMPUSTAT firms in each Fama-French (1997) 48 industry. CEO equity ownership is obtained from Execucomp and is the percentage ownership a CEO owns in his or her firm. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. We control for the same set of variables as those used in column (1) of Table 2. The coefficient estimates of these control variables are suppressed for brevity.

Panel A: Subsample analysis based on tax costs of repatriation

	(1)	(2)	(3)	(4)
	Tax costs of repatriation			
	Low	High	Zero	Positive
ΔC	1.466**	2.344**	1.094	2.350***
	(0.022)	(0.019)	(0.196)	(0.000)
Foreign Cash Ratio*ΔC	-0.945	-2.711**	-0.329	-2.273***
	(0.174)	(0.038)	(0.663)	(0.005)
Foreign Cash Ratio	-0.030	-0.077	0.054	-0.134***
	(0.601)	(0.224)	(0.548)	(0.008)
Other control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	318	317	163	472
Adjusted R-squared	0.274	0.393	0.284	0.350
p-value for test of difference in coefficient of (*Foreign Cash Ratio*ΔC) between the two subsamples	H0: (1)=(2) 0.045		H0: (3)=(4) 0.020	

Panel B: Subsample analysis based on bond ratings

	(1)	(2)
	Bond ratings below investment grade	Bond ratings above investment grade
ΔC	2.365***	1.931***
	(0.000)	(0.008)
Foreign Cash Ratio*ΔC	-1.868***	-0.871
	(0.010)	(0.449)
Foreign Cash Ratio	-0.091	-0.057
	(0.128)	(0.328)
Other control variables	Yes	Yes
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	367	290
Adjusted R-squared	0.340	0.263
p-value for test of difference in coefficient of (Foreign Cash Ratio*ΔC) between the two subsamples	H0: (1)=(2) 0.073	

Panel C: Subsample analysis based on corporate governance and manager-shareholder alignment

	(1)	(2)	(3)	(4)
	Competitive Industry	Non-Competitive Industry	CEO equity ownership above sample median	CEO equity ownership below sample median
ΔC	1.382**	2.998***	1.978***	2.558***
	(0.041)	(0.000)	(0.006)	(0.000)
Foreign Cash Ratio*ΔC	-0.490	-2.307***	-1.072	-3.314***
	(0.602)	(0.002)	(0.179)	(0.000)
Foreign Cash Ratio	-0.137**	0.015	-0.021	-0.136***
	(0.014)	(0.786)	(0.734)	(0.009)
Other control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	329	328	319	319
Adjusted R-squared	0.266	0.319	0.254	0.287
p-value for test of difference in coefficient of (Foreign Cash Ratio*ΔC) between the two subsamples	H0: (1)=(2) 0.084		H0: (3)=(4) 0.044	

Table 4. Foreign cash ratio and the value of cash: Heckman two-stage procedure

This table presents results from a Heckman (1979) two-stage regression. Panel A presents the result from a probit regression of firm's decision to disclose the amount of foreign cash. The dependent variable is a dummy variable that takes the value of one if a firm discloses the amount of foreign cash and zero otherwise. Panel B presents the results of the value-of-cash regressions after controlling for the inverse Mills ratio constructed from the first-stage probit model in Panel A. Detailed variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively.

Panel A: First Stage

Dependent variable	Disclosure of foreign cash (1/0)
Three-year average effective tax rate	-0.392**
	(0.043)
Foreign income tax/Total assets	9.569**
	(0.013)
Log(Total assets)	0.067***
	(0.010)
Return on assets	1.026**
	(0.037)
Cash/Total assets	1.047***
	(0.001)
Tangibility	-1.561***
	(0.000)
Leverage	-0.026
	(0.923)
Tobin's Q	-0.067
	(0.158)
Observations	1,500
Year fixed effects	Yes
Industry fixed effects	Yes
Pseudo R-squared	0.112

Panel B: Second Stage: Value-of-Cash regression

Dependent Variable	(1) ARET25	(2) ARET48	(3) RET	(4) RET
ΔC	2.075***	1.789***	1.937***	2.155***
	(0.000)	(0.001)	(0.000)	(0.000)
Foreign Cash Ratio*ΔC	-1.658***	-1.563**	-1.284**	-1.404**
	(0.005)	(0.011)	(0.038)	(0.033)
Foreign Cash Ratio	-0.058	-0.034	-0.083**	-0.046
	(0.139)	(0.391)	(0.041)	(0.280)
ΔE	0.815***	0.742***	0.926***	0.863***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔNA	0.298***	0.353***	0.397***	0.397***
	(0.003)	(0.001)	(0.000)	(0.000)
ΔRD	0.490	0.391	1.013	0.613
	(0.833)	(0.873)	(0.673)	(0.797)
ΔI	0.230	-0.505	0.272	-1.888
	(0.932)	(0.846)	(0.925)	(0.492)
ΔD	2.822	3.387	4.043*	3.217
	(0.180)	(0.120)	(0.054)	(0.146)
Cash	0.270***	0.278***	0.144	0.321***
	(0.005)	(0.003)	(0.122)	(0.001)
Leverage	-0.368***	-0.318***	-0.329***	-0.335***
	(0.000)	(0.000)	(0.000)	(0.000)
NF	-0.375*	-0.419**	-0.502***	-0.430**
	(0.058)	(0.035)	(0.009)	(0.042)
Cash*ΔC	-0.209	-0.107	-0.084	-0.230
	(0.621)	(0.837)	(0.853)	(0.663)
Leverage*ΔC	0.303	1.009	0.002	0.125
	(0.742)	(0.278)	(0.999)	(0.905)
Inverse Mills Ratio	0.053	0.020	-0.014	0.064
	(0.393)	(0.751)	(0.743)	(0.408)
Observations	657	657	657	657
Year fixed effects	Yes	Yes	No	No
Industry fixed effects	Yes	Yes	No	No
(Portfolio × Year) fixed effects	No	No	Yes	No
(Industry × Year) fixed effects	No	No	No	Yes
Adjusted R-squared	0.268	0.199	0.249	0.306

Table 5. Description of the PRE sample

This table presents summary statistics for the PRE sample. The PRE sample consists of all S&P 1500 firms with foreign income taxes (TXFO) greater than or equal to $1 million during any given year from 1997 to 2012. Financial firms (SIC code 6000-6999) and utilities (SIC code 4900-4999) are excluded. Panel A presents the summary statistics. Panel B presents the correlation matrix of PRE and foreign cash measures. Detailed variable definitions can be found in Appendix B.

Panel A: Summary statistics

	N	Mean	Std	Q1	Median	Q3
Assets (in $mil)	12,209	8,498	32,320	611	1,628	4,995
PRE (in $mil)	12,209	862	3,950	0	41	334
PRE/Asset	12,209	0.079	0.111	0	0.030	0.117
ARET25	12,209	0.056	0.498	-0.231	-0.016	0.227
ARET48	12,209	0.062	0.493	-0.204	0.003	0.233
RET	12,209	0.176	0.558	-0.155	0.100	0.376
ΔC	12,209	0.016	0.084	-0.013	0.005	0.035
ΔE	12,209	0.013	0.125	-0.014	0.008	0.030
ΔNA	12,209	0.060	0.266	-0.016	0.034	0.112
ΔRD	12,209	0.001	0.011	0.000	0.000	0.002
ΔI	12,209	0.001	0.010	-0.001	0.000	0.002
ΔD	12,209	0.000	0.005	0.000	0.000	0.001
Cash	12,209	0.128	0.151	0.030	0.076	0.168
Leverage	12,209	0.190	0.177	0.044	0.149	0.283
NF	12,209	0.007	0.129	-0.042	-0.006	0.023
Foreign Sales Ratio	9,396	0.320	0.241	0.112	0.303	0.490

Panel B: Correlation matrix of PRE and foreign cash

Variables	PRE (in $mil)	Foreign cash (in $mil)	PRE/Asset	Foreign cash ratio
PRE (in $mil)	1			
(p-value)				
Foreign cash (in $mil)	0.8117	1		
(p-value)	(0.000)			
PRE/Asset	0.3114	0.2208	1	
(p-value)	(0.000)	(0.000)		
Foreign cash ratio	0.181	0.1762	0.5276	1
(p-value)	(0.000)	(0.000)	(0.000)	

Table 6. PRE and the value of cash: Baseline results

This table presents the regression results on the relation between PRE and the value of cash. The dependent variable in column (1) is a firm's abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted Fama-French (1993) 25 size and book-to-market portfolio return. The dependent variable in column (2) is Fama-French (1997) 48-industry adjusted abnormal return. The dependent variable in columns (3) and (4) is a firm's raw stock return during the fiscal year. Detailed variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. We control for year fixed effects and industry fixed effects in columns (1) and (2), portfolio-year fixed effects in column (3), and industry-year fixed effects in column (4).

	(1)	(2)	(3)	(4)
Dependent Variable	ARET25	ARET48	RET	RET
ΔC	2.479***	2.322***	2.483***	2.455***
	(0.000)	(0.000)	(0.000)	(0.000)
PRE/Asset*ΔC	-2.094***	-2.095***	-1.894***	-1.737***
	(0.002)	(0.001)	(0.003)	(0.007)
PRE/Asset	-0.155***	-0.156***	-0.143***	-0.145***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔE	0.826***	0.767***	0.880***	0.856***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔNA	0.258***	0.220***	0.303***	0.261***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔRD	0.529	0.629	0.897	0.689
	(0.327)	(0.238)	(0.104)	(0.214)
ΔI	-2.641***	-2.369***	-2.793***	-2.567***
	(0.000)	(0.001)	(0.000)	(0.000)
ΔD	0.004	-0.039	1.523	0.135
	(0.997)	(0.969)	(0.116)	(0.885)
Cash	0.613***	0.598***	0.455***	0.676***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.637***	-0.544***	-0.674***	-0.584***
	(0.000)	(0.000)	(0.000)	(0.000)
NF	-0.088	-0.091	-0.111*	-0.107*
	(0.166)	(0.137)	(0.083)	(0.089)
Cash*ΔC	-1.009**	-0.504	-0.968**	-0.620
	(0.025)	(0.245)	(0.036)	(0.171)
Leverage*ΔC	-2.275***	-2.324***	-2.266***	-2.371***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	12,209	12,209	12,209	12,209
Year fixed effects	Yes	Yes	No	No
Industry fixed effects	Yes	Yes	No	No
(Portfolio × Year) fixed effects	No	No	Yes	No
(Industry × Year) fixed effects	No	No	No	Yes
Adjusted R-squared	0.231	0.222	0.349	0.383

Table 7. PRE and the value of cash: the American Jobs Creation Act of 2004

This table presents the regression results on how the American Jobs Creation Act of 2004 impacts the relation between PRE and the value of cash. The sample is a balanced panel data with equal firm-year observations before, during, and after the tax holiday. The dependent variable is a firm's abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted Fama-French (1993) 25 size and book-to-market portfolio return. Other variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effects.

	(1)	(2)	(3)
	Pre-tax holiday (2003-2004)	Tax holiday (2005-2006)	Post-tax holiday (2007-2008)
ΔC	1.727***	2.683***	2.355***
	(0.000)	(0.000)	(0.000)
PRE/Asset*ΔC	-3.386**	0.028	-2.668***
	(0.024)	(0.984)	(0.005)
PRE/Asset	0.036	0.020	-0.097
	(0.754)	(0.837)	(0.304)
ΔE	1.290***	0.764***	0.658***
	(0.000)	(0.000)	(0.000)
ΔNA	0.135**	0.412***	0.056
	(0.015)	(0.000)	(0.290)
ΔRD	0.297	0.195	-0.527
	(0.789)	(0.816)	(0.568)
ΔI	-4.313***	-6.748***	4.303***
	(0.001)	(0.000)	(0.000)
ΔD	3.485	1.525	-3.744**
	(0.207)	(0.397)	(0.031)
Cash	0.656***	0.350***	0.891***
	(0.000)	(0.000)	(0.000)
Leverage	-0.438***	-0.459***	-0.438***
	(0.000)	(0.000)	(0.000)
NF	0.238**	-0.376***	-0.568***
	(0.031)	(0.000)	(0.000)
Cash*ΔC	0.262	-2.320***	0.948
	(0.694)	(0.001)	(0.164)
Leverage*ΔC	-2.199***	-3.202***	-1.710***
	(0.000)	(0.000)	(0.000)
Observations	1,534	1,534	1,534
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.300	0.288	0.379
p-value for test of difference in coefficient of (PRE/Asset*ΔC) between the subsamples	H0: (1)=(2) 0.056		H0: (2)=(3) 0.068

Table 8. Controlling for global diversification discount

This table presents the results from value-of-cash regressions with global diversification as an additional control variable. The dependent variable is a firm's abnormal stock return over the fiscal year, calculated as raw return minus the value-weighted Fama-French (1993) 25 size and book-to-market portfolio return. Foreign sales ratio is calculated as the ratio of foreign sales over total sales. Geographic segment information is obtained from the COMPUSTAT segment file. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effects.

	(1)	(2)
ΔC	1.682***	2.451***
	(0.006)	(0.000)
Foreign cash ratio*ΔC	-1.604**	
	(0.031)	
Foreign cash ratio	-0.013	
	(0.770)	
PRE/Asset*ΔC		-2.529***
		(0.003)
PRE/Asset		-0.089*
		(0.077)
Foreign sales ratio*ΔC	0.865	0.235
	(0.355)	(0.576)
Foreign sales ratio	-0.249***	-0.085***
	(0.000)	(0.001)
ΔE	0.804***	0.830***
	(0.000)	(0.000)
ΔNA	0.241*	0.306***
	(0.051)	(0.000)
ΔRD	1.348	0.267
	(0.527)	(0.669)
ΔI	1.190	-3.742***
	(0.651)	(0.000)
ΔD	2.442	-0.890
	(0.395)	(0.456)
Cash	0.289***	0.647***
	(0.002)	(0.000)
Leverage	-0.493***	-0.598***
	(0.000)	(0.000)
NF	-0.232	-0.137*
	(0.283)	(0.065)
Cash*ΔC	-0.698	-0.963*
	(0.275)	(0.058)
Leverage*ΔC	0.437	-2.319***
	(0.624)	(0.000)
Observations	553	9,396
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adjusted R-squared	0.334	0.230

Table 9. Domestic investment-cash flow sensitivity

This table presents the results from the investment-cash flow analysis. The dependent variable is domestic investment measured as the aggregate domestic capital expenditure (CAPX) scaled by domestic assets. Domestic (Foreign) Cash Flow is the sum of domestic (foreign) income before extraordinary items (IB) and depreciation and amortization (DP) scaled by domestic (foreign) assets. Tobin's Q is the ratio of market value of assets (AT + CSHO * PRCC – CEQ - TXDB) to book value of assets (AT). Geographic segment information is obtained from the COMPUSTAT segment file. All regressions include year and firm-fixed effects. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Sample	Full	PRE/Asset is above sample median	PRE/Asset is below sample median
Domestic Cash Flow	0.467***	0.619***	0.328*
	(0.000)	(0.000)	(0.050)
Foreign Cash Flow	0.045	0.042	0.071
	(0.269)	(0.529)	(0.517)
Tobin's Q	0.009**	0.010	0.011*
	(0.037)	(0.228)	(0.055)
Observations	809	405	404
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.775	0.845	0.778
p-value for test of difference in coefficient of		H0: (2)=(3)	
Domestic Cash Flow between subsamples		0.026	

Table 10. Cash reserves and investment before and after the financial crisis

This table presents the results from an analysis of corporate investment and the recent financial crisis. Following Duchin, Ozbas, and Sensoy (2010), the dependent variable is quarterly investment measured as capital expenditures (CAPXY) scaled by total assets (ATQ) between July 1, 2006 and June 30, 2008. *After* is an indicator that equals to one for fiscal quarters ending after July 1, 2007 and zero otherwise. Cash is the ratio of total cash (CHE) to total assets (AT) measured at the end of the fiscal year immediately prior to July 1, 2006. Tobin's Q is the ratio of market value of assets (ATQ + CSHOQ * PRCCQ – CEQQ - TXDBQ) to book value of assets (ATQ). Cash flow is the sum of income before extraordinary items (IBQ) and depreciation and amortization (DPQ) scaled by total assets (ATQ). All regressions include firm-fixed effects. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
		PRE/Asset is	PRE/Asset is
Sample	Full Sample	above sample median	below sample median
After	-0.078***	-0.054**	-0.099***
	(0.000)	(0.031)	(0.002)
After * Cash	0.258***	0.123	0.380***
	(0.001)	(0.242)	(0.001)
Tobin's Q	0.091***	0.067***	0.115***
	(0.000)	(0.003)	(0.001)
Cash flow	0.756	1.573**	0.012
	(0.184)	(0.038)	(0.989)
Observations	6,242	3,115	3,127
Firm fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.800	0.799	0.800
p-value for test of difference in coefficient		H0: (2)=(3)	
of (After*Cash) between subsamples		0.032	

Table 11. Foreign cash and foreign acquisitions financed with cash

This table presents the univariate analysis and regression results on the effect of foreign cash ratio (PRE/Asset) on acquirers' returns around foreign acquisition announcement. CAR1 is the acquirer's three-day cumulative abnormal returns around the announcement where abnormal returns are estimated using the market model. CAR2 is the acquirer's market-adjusted three-day cumulative abnormal returns where the market return is CRSP value-weighted return. Other variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year, industry and target country fixed effects, whose coefficient estimates are suppressed for brevity.

Panel A: Univariate analysis

	High Foreign Cash Ratio (n=34)	Low Foreign Cash Ratio (n=34)	Difference
CAR1 (in percentage points)	-0.566	1.802**	-2.368** (0.031)
CAR2 (in percentage points)	-0.475	2.149**	-2.634** (0.027)

Panel B: Regression results

	(1)	(2)	(3)	(4)
Dependent variable	CAR1	CAR2	CAR1	CAR2
Foreign cash ratio	-0.0474*	-0.0482*		
	(0.071)	(0.067)		
PRE/Asset			-0.0390**	-0.0368**
			(0.028)	(0.041)
Firm size	0.0069	0.0066	0.0001	0.0001
	(0.182)	(0.223)	(0.928)	(0.958)
Tobin's Q	-0.0097	-0.0046	-0.0042**	-0.0039**
	(0.672)	(0.845)	(0.021)	(0.029)
Leverage	-0.1840	-0.1584	-0.0308	-0.0219
	(0.234)	(0.331)	(0.269)	(0.435)
FCF	0.1795	0.1619	0.0287	0.0512
	(0.465)	(0.516)	(0.572)	(0.320)
Diversifying	-0.0011	-0.0042	-0.0078	-0.0070
	(0.965)	(0.868)	(0.108)	(0.149)
Public Target	0.0216	0.0116	-0.0065	-0.0062
	(0.422)	(0.670)	(0.362)	(0.390)
Private Target	-0.0098	-0.0164	0.0023	0.0017
	(0.633)	(0.400)	(0.642)	(0.732)
Observations	61	61	653	653
Target country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R-squared	0.309	0.386	0.113	0.105

Table 12. Falsification test: Foreign cash and domestic acquisitions financed with cash

This table presents the univariate analysis and regression results on the effect of foreign cash ratio (PRE/Asset) on acquirers' returns around domestic acquisition announcement. CAR1 is the acquirer's three-day cumulative abnormal returns around the announcement where abnormal returns are estimated using the market model. CAR2 is the acquirer's market-adjusted three-day cumulative abnormal returns where the market return is CRSP value-weighted return. Other variable definitions can be found in Appendix B. In parentheses are p-values based on robust standard errors clustered at the firm level. ***, **, and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effects, whose coefficient estimates are suppressed for brevity.

Panel A: Univariate analysis

	High foreign cash ratio (n=49)	Low foreign cash ratio (n=49)	Difference
CAR1 (in percentage points)	0.394	0.609	-0.215 (0.789)
CAR2 (in percentage points)	0.291	0.450	-0.159 (0.844)

Panel B: Regression results

	(1)	(2)	(3)	(4)
Dependent Variable	CAR1	CAR2	CAR1	CAR2
Foreign cash ratio	0.0050	0.0038		
	(0.815)	(0.858)		
PRE/Asset			0.0147	0.0161
			(0.309)	(0.277)
Firm size	-0.0019	-0.0009	-0.0030**	-0.0033***
	(0.596)	(0.809)	(0.014)	(0.006)
Tobin's Q	-0.0039	-0.0016	0.0023	0.0007
	(0.527)	(0.794)	(0.540)	(0.680)
Leverage	0.2307**	0.2266**	0.0475*	0.0356*
	(0.038)	(0.050)	(0.077)	(0.058)
FCF	-0.0213	-0.0897	-0.0085	-0.0021
	(0.881)	(0.515)	(0.828)	(0.951)
Diversifying	0.0099	0.0122	-0.0037	-0.0039
	(0.347)	(0.224)	(0.228)	(0.211)
Public target	-0.0223*	-0.0184	-0.0137***	-0.0133***
	(0.081)	(0.152)	(0.000)	(0.001)
Private target	-0.0286**	-0.0221	-0.0070**	-0.0064*
	(0.039)	(0.101)	(0.047)	(0.073)
Observations	90	90	2,119	2,124
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Adjusted R-squared	0.190	0.209	0.020	0.015