

**ESSAYS ON THE CAPITAL MARKET
CONSEQUENCES OF DISCLOSURES**

by

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Abstract

This thesis examines the capital market consequences of two new forms of disclosure: foreign cash holdings in 10-K filings, a semi-voluntary disclosure, and firms' presentations at conferences hosted by a variety of third-party organizations, a voluntary disclosure. The first essay exploits the recent trend of disclosing foreign cash holdings by US multinational firms in 10-K filings and investigates the valuation of foreign cash holdings, both relative to domestic cash holdings and cross-sectionally. Firms whose filings in prior years receive a comment on foreign cash from the SEC are much more likely to disclose foreign cash, but internal and external governance structures also affect the likelihood of disclosure. I find that the valuation of foreign cash is similar to the valuation of domestic cash for the same firm. Cross-sectionally, I find that firms who need to pay higher repatriation tax to access foreign cash do not have less valuable foreign cash. Firms whose foreign operations have more severe agency problems have less valuable foreign cash, but firms with higher foreign growth opportunities have more valuable foreign cash.

The second essay studies how managers' presentations at different types of conferences affect firms' information environments, including analyst forecast properties, stock price informativeness and liquidity. Despite their popularity, little is known about conference presentations' impact on capital market efficiency, other than some studies implying that these disclosures might give conference participants an informational edge. I classify conferences based on sponsors into three categories: conferences hosted by brokerage houses (broker-hosted conferences), trade organizations (trade shows), and other parties (investor relation, or IR conferences), and calculate the frequency of attending these conferences for each firm. I find that information quality and uncertainty of the presentations differ across conferences. Broker-hosted

conferences have a positive effect on all the information environment measures, IR conferences have a milder or no effect, whereas trade shows actually have a negative effect across the board. Among all the conferences, only presentations at trade shows are followed by stock price reversals, indicating an initial overreaction to such presentations, possibly due to managers' incentive to oversell new products.

Preface

This dissertation is original, unpublished, independent work by the author, Shuo Yang.

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Dedication

To my parents

Chapter 1: Introduction

Disclosure aids capital providers in two ways— it allows investors to monitor the use of their capital, i.e. the stewardship role, and it allows investors to assess the return on investment opportunities, i.e. the valuation role (Beyer et al., 2010). Although the US disclosure regime is already rich, new forms and venues of disclosures arise as technologies or economic environments evolve. An example of technology-induced disclosure is announcing news on social networks such as Twitter (Blankespoor et al., 2014). An example of economy-induced disclosure is sovereign risk exposure by banks following the Eurozone sovereign debt crisis (Bischof and Daske, 2013). Beyer et al. (2010) urges researchers to examine more measures of disclosures. Understanding the consequences of these novel disclosures is crucial in assessing how investors use the information to better monitor managers and form valuation, and how the new information affects stock market efficiency. This thesis investigates two new and understudied disclosures and their capital market consequences. First, I examine the disclosure of foreign cash holdings by US multinational firms, in Chapter 2. As globalization expands, foreign operations of US multinational firms become progressively significant, and disclosing foreign cash holdings in 10-K filings has emerged as a new trend. Foreign cash holdings have sparked heated discussions among politicians, tax experts and academic researchers in recent years, who tend to label the large amount of foreign cash as a “distortion” or “anomaly”. It is important to understand what incentives motivate some multinationals’ managers to disclose foreign cash holdings. More importantly, the new disclosure affords investors an opportunity to value a large piece of assets, cash holdings, in a more refined fashion. That is, investors now can value foreign cash and domestic cash separately whereas they can only value the aggregated amount without the disclosure. The valuation of foreign cash holdings will reveal equityholders’ interpretation of

foreign cash holdings and contribute to the debate. Chapter 3 examines conference presentations where managers are invited to present about their firms at conferences hosted by a variety of third-party organizations. The prevalence of this type of voluntary disclosure channel warrants more in-depth investigation than what has been documented by the literature so far. I study conference presentations' effect on a comprehensive set of information environment proxies, and the results show interesting patterns for conferences held by different parties. Taken together, this thesis studies how new disclosures fulfil the stewardship and valuation roles in a recent sample.

In Chapter 2, I examine which firms choose to disclose foreign cash holdings and how investors utilize the disclosure in valuing multinational firms. Cash is the most liquid and a sizable asset controlled by firms, but firms are not required to disclose where cash is legally located. Around 65% of S&P 500 firms are multinational in 2013, and some of them are the largest firms in the US economy.¹ The location of cash is potentially very important because a large proportion of cash might not be in the US where most of the investors are. Due to the US worldwide tax system, earnings made by US firms, domestic or foreign, are subject to US taxation, one of the highest rates in the world. However, the taxation on foreign earnings only occurs when they are repatriated to the US. Taxes already paid on foreign earnings in foreign countries can be used as a tax credit, but for firms operating in low-tax foreign countries, the tax credit is limited. To avoid the repatriation tax, many US multinational firms simply choose not to repatriate the cash, and consequently both foreign earnings and foreign cash keep growing to a substantial amount but are trapped overseas. The potential repatriation tax makes foreign cash relatively illiquid, and it is harder for US investors to control foreign cash due to agency

¹ Based on my calculation using COMPUSTAT data.

problems associated with foreign operations. In recent years, policymakers have grown increasingly concerned about the huge amount of foregone tax revenue lost due to multinationals parking earnings offshore. Also, eager to boost investment and create jobs in the US after the financial crisis, policymakers consider the large piles of foreign cash rather unsettling. On one hand, firms might have to forego domestic investment opportunities because a sizable proportion of their cash is trapped overseas. On the other hand, firms might overinvest overseas because managers do not make the best investment decisions when they have a lot of cash available (Jensen, 1986). The SEC, therefore, has been pressuring some firms into disclosing foreign cash holdings. Correspondingly, more and more firms voluntarily disclose foreign cash holdings in the 10-K filings, and foreign cash disclosure has gradually become the new norm. The new disclosures afford investors the opportunity to assess firms' policy of holding foreign cash. However, the SEC still has not made disclosing foreign cash a mandatory requirement, and the disclosure so far has been semi-voluntary in nature. In this paper, I first examine how the SEC targets firms when requesting foreign cash disclosure. The SEC might only use a rule-of-thumb in sampling firms (e.g. targeting big firms) rather than more sophisticated approach on behalf of investors (e.g. targeting firms more likely to hold and abuse foreign cash). If the latter is the case, investors should demand disclosure of foreign cash from firms directly. It is also very interesting to examine the SEC's behavior in this setting, because foreign cash is information the SEC solicits above and beyond US GAAP. I then examine how firms choose their disclosure of foreign cash, given the SEC's requests (or lack thereof). Firms are not mandated to follow the SEC's demand if they can provide a sufficient reason, but the SEC's comment letters do have powerful effect on changing firms' disclosure behaviors in other settings. Examining the determinants of foreign cash disclosure also helps us understand which managerial incentives are

associated with the transparency regarding foreign operations, a rather important but opaque aspect of multinational firms. More importantly, with the disclosure it is possible to examine whether equityholders, who actually have a stake in multinational firms (as opposed to policymakers who are not direct stakeholders), indeed view foreign cash as problematic and discount foreign cash relative to domestic cash for the same firm. I further examine whether the valuation of foreign cash holdings varies with the extent of the repatriation tax, the severity of agency problems of foreign operations, and foreign growth opportunities. I find that for a given firm foreign cash is valued similarly to domestic cash, suggesting that investors do not discount foreign cash. I do find that when firms have a lot of foreign cash to begin with, having one additional dollar of foreign cash is less valuable, a result found for total cash holdings in prior studies. However, this effect is absent in domestic cash. This result indicates that the free cash flow problem is mostly driven by the foreign cash component. Contrary to conventional wisdom, in the cross-sectional tests I do not find that firms who need to pay the repatriation tax to access foreign cash have less valuable foreign cash. This can be explained by investors' expectation of tax planning by firms or another tax holiday in the near future. Instead, agency problems of foreign operations and foreign growth opportunities are important factors explaining the cross-sectional variation in the valuation of foreign cash holdings. Firms who hide foreign operations from investors, operate in more foreign countries and delegate decision-rights to foreign subsidiaries have less valuable foreign cash, but firms with faster growing foreign sales have more valuable foreign cash. Lastly, I find that when the Treasury shut down several loopholes firms might use to avoid the repatriation tax during inversions, firms whose cash is mostly foreign do not have very negative market reaction. A possible explanation is that although losing tax avoidance strategies is bad, engaging in deals purely driven by tax consideration is even

worse. The Treasury's rule changes lessen the incentives to merge simply for tax reasons, which is not universally bad news for foreign-cash-rich multinational firms.

In Chapter 3, I explore other aspects of capital market consequences in a different disclosure setting—conference presentations. Conference presentations have gained increasing popularity in recent years. They are arguably the most prevalent investor relation activity that demand managers' time, but there is only limited research on them. Investors do not always have the chance to meet with managers personally and ask questions, and it gets even harder after Reg FD that forbids preferential disclosure of material information to select investors. Conferences present valuable opportunities to co-locate managers of firms and interested parties, facilitating information transfer in an efficient manner. Prior research has established that conference presentations have information content, and the market reaction to these disclosures depends on the characteristics of the conferences (Bushee et al., 2011). However, it is unclear how conferences affect firms' information environments in terms of efficiency (i.e. whether conferences help analysts make more accurate forecasts or help stock price incorporate information more quickly). Also, most existing papers on conference presentations focus only on conferences held by brokerage houses. It is possible that conferences hosted by different sponsors affect information environment in varying degree. In Chapter 3, I examine all the conferences US firms present at during 2004 to 2012 and classify them into three groups. Conferences held by brokerage houses (broker-hosted conferences), industry organizations (trade shows), and other parties such as investor relation firms (investor relation conferences). These conferences differ on two fronts: the capital-market-orientedness and the monitoring from capital market participants; the nature of disclosed information. Broker-hosted conferences mainly serve analysts whose major task is to forecast firms' earnings and brokerage houses' major clients, the

institutions who trade presenting firms' stocks. Trade shows are not directly oriented toward the capital market, and managers are under less pressure to provide satisfactory answers for the audience. When managers take the lead and control the agenda, it is more likely to be "canned presentations" (Brown et al., 2014). Moreover, managers disclose different kinds of information at different conferences. Given the capital market focus of broker-hosted conferences, the audience demands financial information from managers to help them make forecasts and place trades, and the information should help reduce the uncertainty in earnings. In contrast, managers disclose new product-related non-financial information at trade shows that is inherently uncertain and not well processed by the market. Disclosure at trade shows might even change the underlying fundamentals so much that it is not simply a signal for the existing fundamentals, i.e., after the trade shows, investors realize they are trading on a different and more complicated company. I predict that broker-hosted conferences have the most positive effect on the information environment, trade shows have the least positive effect, and investor relation conferences' effect is somewhere in the middle. The results show that when firms present at broker-hosted conferences more often, analyst forecasts are more accurate and less dispersed. Stocks of presenting firms also have lower idiosyncratic risk, higher future earnings response coefficient (FERC), and higher liquidity. Interestingly, the frequency of presenting at trade shows has universally negative effect on almost all the information environment proxies. The frequency of presenting at investor relation conferences has less positive effect than broker-hosted conferences. These results indicate that conferences are heterogeneous and their effects on firms' information environment depend on the sponsors, the targeted audience and the nature of disclosed information. The negative effect of trade show presentations suggests that firms disclose large dose of fundamentals-related news that increases uncertainty and makes investors

more likely to disagree. Market reactions to trade show presentations also reverse quickly, indicating an initial overreaction to the disclosed information.

Chapter 2: The disclosure and valuation of foreign cash holdings

2.1. Introduction

Cash holdings of US corporations have been steadily growing, especially for multinational firms (Pinkowitz et al., 2013). Because the US uses a worldwide tax system, bringing foreign earnings home triggers the repatriation tax determined by the difference between the US statutory tax rate and the foreign tax rate. Since US multinationals often operate in countries with tax rates much lower than the US, the repatriation tax can be sizable, motivating firms to keep foreign earnings offshore (Foley et al., 2007). It is estimated that at least 60% of US multinational firms' cash is held by their foreign subsidiaries (Mott et al., 2012). The foreign cash issue has recently fueled a controversial discussion about US tax code reform among policy makers who are eager to stimulate domestic investment and employment in the post-crisis era. The immediate concern of policy makers is investment distortion – specifically, domestic underinvestment and foreign overinvestment. Foreign cash, often described as “trapped”, cannot be cheaply used to the benefit of the US economy. Given the trapped nature of foreign cash, firms may overinvest in foreign countries. For example, Microsoft used its trapped foreign cash to acquire Skype and Nokia, but both deals were poorly received by the market. This paper's main focus is on how investors value foreign cash holdings in the equity market, but it starts by investigating the interaction between the regulator (the SEC) and multinational firms in determining the disclosure of foreign cash holdings. Given the self-selection nature of the disclosure of foreign cash holdings, a determinant model of foreign cash disclosure is needed before the examination of the valuation implications. Further, understanding how the SEC and multinational firms together shapes the disclosure regime for foreign cash holdings helps us understand the regulator's interpretation and managers' incentives with respect to foreign cash. The SEC started urging some firms to disclose foreign cash

holdings in its review of 10-K filings in 2011 (Thomas, 2011), and this paper first studies how the SEC targets firms. Secondly, this paper investigates firms' decision to disclose foreign cash holdings, given the SEC's comment letters (or lack thereof). Finally, and most importantly, this paper is able to examine how investors value foreign cash holdings and whether they condition the valuation of foreign cash holdings on firms' characteristics, including the repatriation tax, agency problems of foreign operations, and foreign growth opportunities.

Using hand-collected data from SEC comment letters and 10-K filings for fiscal years 2010-2013, I find that the SEC targets big firms with limited growth and a large amount of permanently reinvested earnings. On the part of multinational firms, comment recipients are 26% more likely to disclose foreign cash than non-recipients. Comments on peer firms also increase the likelihood of disclosure for firms themselves. Bigger firms with higher total cash holdings, larger permanently reinvested earnings, and Big 4 auditors are more likely to disclose, but firms with a CEO who is also the Chairman, as well as large free cash flow, are less inclined to disclose.

Having established the disclosure model, I turn to the main task of this paper – the valuation of foreign cash holdings. Previous studies using different estimates of and proxies for foreign cash holdings suggest that they could be valued less than domestic cash holdings (Campbell et al., 2014; Bryant-Kutcher et al., 2008). They argue that unlike foreign cash, there is no additional tax cost for using domestic cash. Also, agency problems from excess cash are arguably less severe for domestic cash than foreign cash.

Anecdotal evidence, however, indicates that firms can sometimes funnel foreign cash back to the parent without paying too much repatriation tax through complicated tax-planning (Zion et al., 2011; Drucker, 2010; Linebaugh, 2013b). Also, firms can save foreign cash to be brought back in anticipation of an upcoming tax holiday, and some big firms are indeed lobbying for such a tax

break (Newmyer, 2011). To what extent the repatriation tax renders foreign cash holdings different from domestic cash holdings remains uncertain. Moreover, foreign markets may offer the best growth opportunities for many US multinational firms, and foreign cash is a source of funds to these profitable foreign projects. Indeed, previous studies find foreign earnings are valued higher than domestic earnings, a result they attribute to the higher foreign growth opportunities (Bodnar and Weintrop, 1997; Collins et al., 1998). Foreign cash could be valued higher than domestic cash for exactly the same reason.

Controlling for the self-selection of voluntary disclosure, I find that, *for a given firm*, foreign cash holdings are valued similarly to domestic cash holdings. I do, however, find that the foreign cash value decreases in the foreign cash level but the domestic cash value does not depend on the domestic cash level. This result is consistent with the argument that agency problems are more severe for foreign operations than domestic operations; that is, one more dollar of foreign cash is more likely to be abused when firms have already accumulated a lot of foreign cash.

I further identify three firm characteristics relevant to foreign cash holdings and investigate their effects on the foreign cash value cross-sectionally. The first firm characteristic is the repatriation tax. I find no evidence that the repatriation tax, measured by either the non-binding foreign tax credit status (which occurs when the average foreign tax rate is less than the US statutory tax rate) or the disclosure of the repatriation tax, negatively affects the valuation of foreign cash holdings.

The second firm characteristic is agency problems of foreign operations from the perspective of investors. Specifically, I use proxies for the disclosure, the organizational complexity, and the decision-rights arrangement of foreign operations to capture the monitoring difficulty for investors. I find foreign cash holdings are less valuable when firms only report

foreign subsidiaries partially in their Exhibit 21, relative to the foreign operations collected by the OSIRIS international database. Foreign cash holdings are also less valuable when firms operate in more foreign countries, but are more valuable when the US parent controls foreign subsidiaries' decision-rights.

The third firm characteristic is foreign growth opportunities. Confirming the crucial role of foreign growth opportunities, I find that foreign sales growth not only increases the value of foreign cash but also the value of domestic cash. In sharp contrast, domestic sales growth does not increase either.

The Treasury Department issued a notice of regulations in response to the recent wave of tax inversions (US firms relocate to foreign countries through acquiring foreign firms) on September 22, 2014. Most of the actions are aimed at making avoidance of the repatriation tax on existing foreign earnings harder for inverted firms. I find that the stock price of multinationals, involved in inversions or not, falls upon the announcement, especially for firms who do not disclose foreign cash holdings.

This paper differs from other studies on foreign cash valuation in two major ways. First, other studies do not take foreign growth opportunities into account. This paper explicitly demonstrates the importance of foreign growth opportunities in valuing foreign cash. Second, other studies rely on proxies for or estimates of foreign cash holdings, and this paper uses actual foreign cash holdings disclosed in public filings. As will be discussed in Section 2.6, different methods of estimating foreign cash holdings can generate inconsistent conclusions.

The rest of the paper is organized as follows. Section 2.2 includes the background of the US tax rules for foreign earnings, a brief literature review, and the hypothesis development. Section 2.3 presents the models. Section 2.4 provides sample selection. Section 2.5 shows the

empirical results. Section 2.6 discusses the foreign cash estimates used in other studies. Section 2.7 investigates market reactions to the Treasury Department’s crackdown on inversions, and Section 2.8 concludes.

2.2. Background, prior literature, and hypothesis development

2.2.1. Background

Earnings by US multinational firms’ foreign subsidiaries are subject to US taxation at the statutory tax rate, offset by the taxes paid in foreign countries. Although the cash tax happens only when foreign earnings are repatriated to the parent, US income tax expense is recognized when foreign earnings are earned under US GAAP, unless they are declared as permanently reinvested in foreign countries. Suppose the US statutory tax rate τ_D is higher than the foreign tax rate τ_F , and one dollar of after-foreign-tax foreign earnings is repatriated to the US as a dividend.² The repatriation tax is calculated as follows: the one dollar is “grossed up” by foreign tax rate first, $1/(1-\tau_F)$, and this amount is subject to the US tax rate of τ_D , resulting in $\tau_D/(1-\tau_F)$ US gross tax. The foreign taxes paid, $\tau_F/(1-\tau_F)$, can be used as tax credit. Therefore, the repatriation tax equals $\tau_D/(1-\tau_F) - \tau_F/(1-\tau_F) = (\tau_D - \tau_F)/(1-\tau_F)$.

Importantly, the repatriation tax does not need to be recognized if the US parent intends to permanently invest foreign earnings in foreign operations by designating them as permanently reinvested earnings (PRE) under APB Opinion 23 of US GAAP. If PRE are invested in foreign operating assets, neither the operating assets per se nor earnings on the operating assets will be taxed by the US until they are eventually repatriated. If PRE are invested in foreign financial assets (e.g., PRE are held in a foreign bank account as foreign cash earning interest), earnings on the financial assets (e.g., interest) will be taxed by the US immediately according to Subpart F rules

² Nowadays, it is usually the case because the US has the highest statutory tax rate worldwide (Hanlon et al., forthcoming).

of Internal Revenue Code. The initial investment in financial assets per se (e.g. foreign cash that is designated as PRE), however, will not be taxed until it is repatriated.

If foreign operating assets are already at the optimal level, the US parent has two options to dispose of foreign earnings – it can either repatriate foreign earnings to the US immediately or invest in foreign financial assets.³ Repatriating one dollar of foreign earnings results in cash flow of one dollar net of the repatriation tax – $1 - (\tau_D - \tau_F) / (1 - \tau_F) = (1 - \tau_D) / (1 - \tau_F)$ – to the parent, and the cash flow is less than one dollar if $\tau_F < \tau_D$. Investing in foreign financial assets and only repatriating earnings on foreign financial assets each year results in a perpetuity of $(1 - \tau_D)R$, where R is the interest rate (because these earnings are taxed by the US each year as they are earned), and its present value could be either higher or lower than the repatriation cash flow $(1 - \tau_D) / (1 - \tau_F)$, depending on the discount rate.

2.2.2. Prior literature

Foley et al. (2007) find that foreign cash holdings of US multinational firms are positively related to the repatriation tax, using proprietary surveys conducted by the Bureau of Economic Analysis (BEA).⁴ Bryant-Kutcher et al. (2008) find that foreign cash held for the purpose of avoiding the repatriation tax is valued less.⁵ They argue that holding foreign cash has all of the costs of holding domestic cash (e.g. agency problems) but not all of the benefits (e.g., accessibility). In a similar vein, Chen (2014) finds that total cash holdings are less valuable for firms with higher repatriation tax. Taking Foley et al. (2007)'s conclusion as given, she argues that higher

³ In reality, however, many foreign financial assets are not really “foreign”. Linebaugh (2013a) observes that some companies hold a large amount of foreign cash in US dollars or in US Treasury because managers do not want their earnings to be affected by exchange rate risk.

⁴ Although foreign cash holdings data have been collected by BEA through surveys since the 1980s, only publicly disclosed foreign cash holdings in 10-K filings are appropriate for valuation purpose. Shareholders cannot value information they cannot access.

⁵ Since they do not observe foreign cash holdings, they examine the valuation of PRE. If the firm has high PRE and excess cash holdings based on an optimal cash holdings model, they assume PRE is held in the form of cash.

repatriation tax signifies higher foreign cash holdings, so her result implies that foreign cash is less valuable than domestic cash. Campbell et al. (2014) (CDKS hereafter) and Thakor (2013) develop two rather different methods to estimate foreign cash holdings and assess the valuation consequences of the estimates. The former study concludes that estimated foreign cash holdings are valued less than estimated domestic cash holdings, but the latter finds the opposite result.

Hanlon et al. (forthcoming) and Edwards et al. (forthcoming) find higher foreign cash holdings are associated with more negative market reactions to the announcement of cash-funded foreign acquisitions. Hanlon et al. (forthcoming) use the repatriation tax as the proxy for foreign cash holdings.⁶ Edwards et al. (forthcoming) use high total cash holdings combined with high PRE as the proxy for high foreign cash holdings.⁷

2.2.3. Hypothesis development

This section discusses several factors that affect foreign cash holdings differently than domestic cash holdings, and first develop hypotheses on how foreign cash holdings are valued relative to domestic cash holdings for a given firm. The natural benchmark for the valuation of foreign cash holdings is the valuation of domestic cash holdings for the exact same firm, as every other firm characteristic is held constant, except for the location of the cash holdings. Next, I examine cross-sectionally how the valuation of foreign cash holdings varies with these factors among multinational firms.

⁶ The repatriation tax used in Hanlon et al. (forthcoming) is a flow-based measure ($\text{Pre-tax foreign income} \times 35\% - \text{Foreign income taxes}$), which represents how much more taxes would be due if earnings of the *current* year were repatriated. Foreign cash, however, is a stock variable, and conceptually should be determined by the stock of the repatriation tax.

⁷ It is worth noting that both papers have to make two crucial assumptions – foreign acquisitions are made by foreign subsidiaries (not the US parent) using foreign cash (not domestic cash). Empirically, it is impossible to verify either assumption because firms usually do not disclose their deal specifics on this level of granularity.

2.2.3.1. Repatriation tax

The foremost difference between domestic and foreign cash is tax basis. Domestic cash is after both US and foreign taxes and ready for use without additional costs. Foreign cash is only after foreign tax and its use triggers the repatriation tax, if the foreign tax rate is lower than the US tax rate. Given the widespread use of tax havens by US multinationals (Dyreng and Lindsey, 2009), many firms will incur the repatriation tax if they access their foreign cash. The different tax basis suggests foreign cash is more expensive to use and less valuable than domestic cash.

In practice, the repatriation tax that firms actually face is rarely as simple as the formula $(\tau_D - \tau_F)/(1 - \tau_F)$. This formula assumes firms have only one foreign subsidiary in one country. In reality, firms usually operate in multiple foreign countries and their foreign subsidiaries all have different degrees of profitability. For example, Pixelworks, Inc., in its 10-K filing for fiscal year 2013, discloses, “Although cash balances held at our foreign subsidiaries would be subject to US taxes if repatriated, we have sufficient US net operating losses to eliminate the liability associated with any such repatriation and foreign taxes due upon repatriation would not be significant.” It is precisely the complex and hypothetical nature that many firms cite as the reason they do not provide an estimate of the repatriation tax.

Also, anecdotal evidence suggests that firms employ tax-planning strategies to circumvent the repatriation tax to bring home foreign cash tax-free. Drucker (2010) discusses several tax-planning quirks nicknamed “Killer B”, “Deadly D” and “Outbound F”, based on the IRS tax code loopholes they take advantage of. For example, “Killer B” stands for the strategy where the US parent issues shares to its foreign subsidiaries in exchange for their cash (a tax-free transaction), and foreign subsidiaries can use the shares as currency to make other acquisitions. Some firms also indicate in their 10-K filings that they will time or structure the repatriation such that minimal tax

will be incurred. For example, Eastman Kodak's 10-K filing in 2010 says "from time to time and to the extent that the Company can repatriate overseas earnings on essentially a tax-free basis." Some firms are also able to pull cash from foreign subsidiaries as short-term loans and incur no taxes, as long as the firms are careful enough not to let these loans cross the boundaries of fiscal quarters and breach IRS rules (Linebaugh, 2013b). As an example, Scientific Games Corp states in its 10-K filings in 2012 that "A significant amount of the cash held by our foreign subsidiaries as of December 31, 2013 could be transferred to the US as intercompany loan repayments and other tax-free basis reductions." Therefore, the repatriation tax might not be as drastic as the face value suggested by the simplified formula. As Stephen Shay, a tax professor of Harvard Law School, put it, "Less money is trapped offshore than thought" (Linebaugh, 2013b).

Investors might not expect firms to actually pay the face value of the repatriation tax, either. Howard (2014) finds that after 2010 (which is exactly my sample period) the repatriation tax is valued less negatively because investors anticipate another possible tax holiday. Foreign cash, therefore, might not be heavily discounted because their use is not expected to be that costly.

A subtler implication of the repatriation tax is the detrimental effect of domestic underinvestment, especially for financially constrained firms. This is also one of the most popular concerns raised by policy makers and politicians who advocate a tax regime overhaul. The idea is that firms without easy access to external funds or sufficient domestic cash flows to finance domestic investment could have tapped into their foreign cash but did not because of the reluctance to pay the repatriation tax. Faulkender and Petersen (2012) indeed find that domestic investment increased for financially constrained firms during the last tax holiday (American Job Creation Act in 2004). They also find, however, that most firms who did repatriate during the tax holiday were

not financially constrained, suggesting that the repatriation tax and foreign cash holdings that go along with it do not cause significant domestic underinvestment in the first place.

Domestic underinvestment is only one side of the coin. The other side of the same coin is foreign overinvestment, which will be discussed below.

2.2.3.2. Agency problems of foreign operations

Agency costs in terms of monitoring and bonding foreign operations are high (Doukas and Travlos, 1988). Managers have incentives to hold on to cash because they do not want to subject themselves to the discipline of the external capital market (Jensen, 1986), and the repatriation tax gives managers a legitimate reason to keep cash offshore but still inside firms. Agency problems, although not specific to foreign operations, is more severe for foreign operations than domestic operations for several reasons. First of all, the disclosure of foreign operations by multinational firms is opaque. Geographic segment reporting is highly aggregated and voluntary, and information on the foreign segments' management is close to non-existent. From the standpoint of investors, the information asymmetry with foreign operations is much worse than domestic operations, and it provides opportunities for managers to abuse foreign resources. Thomas and Hope (2008) find that firms who stop reporting geographic segment earnings after SFAS 131 exhibit empire-building behavior in their foreign operations.

Besides opaque disclosure, multinational firms also have more complex organizational structures (Creal et al., 2013). Multinational firms, usually conglomerates that also diversify in industries (Denis et al., 2002), might allocate internal resources irrationally, and the investment inefficiency can be tied to agency problems (Glaser et al., 2013; Ozbas and Scharfstein, 2010).

In addition to the traditional principal-agent relation between investors and the US parent, there exists an internal principal-agent relation between the US parent and foreign subsidiaries

(Shroff et al., 2014). This additional layer of agency, coupled with the geographic distance, makes foreign operations farther out of reach for investors.

As mentioned earlier, the flip side of domestic underinvestment caused by the repatriation tax is foreign overinvestment. When firms accumulate significant amounts of cash abroad, investors are likely to pressure managers to distribute cash. If managers are reluctant to repatriate and take the tax bite or do not want to relinquish control over cash, they will look for opportunities to spend the foreign cash. Although this strategy per se does not necessarily destroy shareholders' value if returns on foreign investment are more favorable than receiving after-repatriation-tax cash, prior studies suggest that managers do not make the best investment decisions when they have a lot of cash at their disposal (Harford, 1999). Evidence provided by Edwards et al. (forthcoming) and Hanlon et al. (forthcoming) also indicates foreign overinvestment. Foreign cash holdings, therefore, imply investment distortion on both the domestic and foreign fronts.

2.2.3.3. Foreign growth opportunities

Despite the pitfalls of keeping cash offshore, one cannot ignore why firms choose to operate in foreign countries in the first place – foreign countries represent the highest growth for many multinationals. The transaction cost explanation of cash holdings suggests that firms with higher growth opportunities should hold more cash, because it is more important for them to have inexpensive internal funds to finance positive NPV projects. By the same token, if foreign subsidiaries have more growth opportunities than their US parent, it is rational for them to hold more cash. Desai et al. (2011) show that US foreign investment is “dynamically efficient” in the sense that cash flows from foreign affiliates exceed net investments, so foreign investment is a source of funds to the US rather than a sink.

Bodnar and Weintrop (1997) and Collins et al. (1998) find that foreign earnings have a higher earnings response coefficient than domestic earnings, and they attribute this finding to the higher foreign growth opportunities. Creal et al. (2013) provide evidence that there is a “multinational advantage” in the sense that multinational firms are valued more than the sum of imputed value of their country-industry segments, and the value differential increases in foreign sales.⁸ They conclude that the benefits provided by efficient internal capital market dominate the higher agency problems. Given the sheer size of foreign cash holdings and the fact that cash is roughly valued dollar for dollar, it is hard to imagine that foreign cash is discounted by investors but the multinational advantage still exists. These studies taken together suggest that foreign sales or earnings are viewed favorably in the equity market. If everything else foreign is rewarded by investors, it is possible that foreign cash can also be deemed more valuable.

2.2.3.4. Efficient internal capital market

Prior literature on multinational firms demonstrates that multinationals can successfully employ their internal capital market to circumvent market frictions. Desai et al. (2006) show that multinationals actively get around host countries’ capital controls through repatriation of profit. Desai et al. (2004) and Huizinga et al. (2008) find that multinationals shift more debt to high tax-rate countries to take advantage of the tax shield. Desai et al. (2008) find US multinationals’ foreign subsidiaries increase investment more than local firms when the host countries experience currency depreciation, because the subsidiaries can turn to internal capital market for funds. These findings indicate that multinationals are capable of moving their internal funds across borders to

⁸ The study is in the same genre as diversification discount/premium literature where the value of a multi-segment firm is compared with the sum of the value of each segment had it been a stand-alone firm. Denis et al. (2002) find a globalization discount rather than premium for multinational firms, but Creal et al. (2013) point out a methodology weakness in their paper. When calculating the imputed value of each geographic segment, Denis et al. (2002) match it to firms in the same industry in the US. Creal et al. (2013), on the other hand, match each segment with firms in the same industry and the same country, because the contra-factual of the segment would be a stand-alone firm in the same industry and geographic region rather than a firm in the same industry in the US. Using a similar methodology to Denis et al. (2002), Bodnar et al. (1999) also find a globalization premium rather than discount.

maximize the valuation of the entire firm. If multinationals understand that investors value cash more when it resides in certain places, they are motivated to move cash internally to the places where it is mostly valued. In this sense, the valuation of cash holdings should not depend on their locations because geography might not be a significant constraint for multinationals.

2.2.3.5. Hypotheses

My first hypothesis predicts for a given firm how foreign cash is valued relative to domestic cash when all the factors discussed above are taken into account. Given the countervailing forces, I state the hypothesis in the null form:

Hypothesis 1: Foreign cash is valued similarly to domestic cash.

In addition to the average effect, I further explore how the cross-sectional variation in the factors discussed above – the repatriation tax, agency problems of foreign operations, and foreign growth opportunities – will affect the valuation of foreign cash holdings.

The first factor is the repatriation tax. Firms whose foreign tax rate is greater than the US tax rate have binding foreign tax credit status and will not trigger any additional tax costs upon repatriation, but firms with non-binding foreign tax credit status will. Also, firms who offer an estimate of the repatriation tax in their filings do so arguably because the amount is material (Bryant-Kutcher et al., 2008). Therefore, the second hypothesis is predicted as follows:

Hypothesis 2: Firms with non-binding foreign tax credit status have less valuable foreign cash.

Firms who voluntarily disclose their repatriation tax have less valuable foreign cash.

The second factor is agency problems of foreign operations, and I examine this factor through multiple angles, including the disclosure, the organizational complexity, and the decision-rights arrangement of foreign operations. The only publicly available disclosure on foreign

subsidiary level is Exhibit 21, one of the attachments filed with 10-K filings. The SEC requires firms to list the name and location of subsidiaries that are significant operations in Exhibit 21. This disclosure, although small, provides investors a chance to gauge the scope and complexity of foreign operations (Holzer, 2013). The SEC, however, gives firms leeway in deciding what is “significant.” As a result, disclosure of subsidiaries in Exhibit 21 can be strategic, and some multinational firms do not even file Exhibit 21. Holzer (2013) and Gremalich and Whiteaker-Poe (2013) document “the vanishing subsidiary” phenomenon, in which some of the largest US multinational firms disclose fewer and fewer subsidiaries in Exhibit 21. For example, Oracle reported more than 400 subsidiaries in 2010, and the list shrank to eight subsidiaries in 2012. Not knowing how many foreign subsidiaries the multinational firm has and where it operates poses a big challenge for investors to understand and monitor foreign operations. Assuming investors can assess whether firms disclose too few foreign subsidiaries, I predict that investors will discount the value of foreign cash for firms who underreport foreign operations. I use the OSIRIS international database that collects firms’ foreign subsidiaries through company registries in foreign countries as the benchmark against which I compare firms’ own disclosure.⁹ Information asymmetry reduces the value of total cash (Drobetz et al., 2010), and intuitively, information asymmetry with respect to foreign operations should be negatively associated with the value of foreign cash.

Because of operations in different locations, the complex organization of multinational firms makes monitoring managers harder (Bodnar et al., 1999). It is reasonable to assume that the extent of organizational complexity and the difficulty of monitoring increase in the number of

⁹ For example, Apple Inc discloses only two to three Irish subsidiaries each year in Exhibit 21. For such a large firm, it is hard to imagine it has this few material foreign subsidiaries. Apple has more than 50 foreign subsidiaries in OSIRIS.

distinct foreign countries. Morck and Yeung (1991) also use this measure to capture “multinationality”.¹⁰ I expect multinationals operating in more foreign countries to have less valuable foreign cash.

As discussed above, there exists an internal agency between the US parent and foreign subsidiaries. Robinson and Stocken (2013) introduce a simple way of measuring the location of foreign subsidiaries’ decision-rights, a contractual arrangement within multinationals. They argue that if foreign subsidiaries use the local currency instead of the US dollar as the functional currency, it indicates that foreign subsidiaries themselves control their own decision-rights. Using US dollar as the functional currency, on the other hand, indicates a more centralized control by the US parent. Admittedly, the location of decision-rights is not completely congruent with the idea of the internal agency problems. Decentralizing decision-rights might be the optimal organizational form given the business environment rather than the parent’s lack of ability to enforce control over foreign subsidiaries. Still, I argue that these two constructs are related, i.e., when decision-rights largely lie in the hands of the US parent, agency problems between the US parent and foreign subsidiaries are alleviated. From the perspective of investors, centralized decision-rights make foreign cash more accessible in the sense that investors can control it better through monitoring the US parent. The three aspects of agency problems of foreign operations and their effects on foreign cash are summarized as follows:

Hypothesis 3: Foreign cash is valued less when firms underreport foreign subsidiaries in Exhibit 21. Foreign cash is less valuable when firms operate in more foreign countries. Foreign cash is more valuable when the US parent controls foreign subsidiaries’ decision-rights.

¹⁰ Prior studies often use the number of geographic segments to measure complexity (e.g., Li, 2008), but the grouping is rather coarse and the cross-sectional variation is very limited.

Finally, I explicitly examine the effect of foreign growth opportunities on foreign cash holdings. Total cash holdings are shown to be more valuable when firm-level investment opportunities are higher (Pinkowitz and Williamson, 2002). By the same token, the valuation of foreign cash holdings should increase in foreign growth opportunities. Foreign investment opportunities might even spill over to domestic operations, offsetting the domestic underinvestment concern. Desai et al. (2009) show that domestic investment is positively related to foreign investment. To state the hypothesis formally,

Hypothesis 4: Foreign cash is more valuable when foreign growth opportunities are higher.

2.3. Sample selection

Since disclosing foreign cash holdings is a new phenomenon, I focus on US multinational firms in COMPUSTAT from fiscal year 2010 to 2013. To first identify a sample of US multinational firms, I retrieve all firms in COMPUSTAT with non-missing and non-zero “Pretax income-Foreign” (PIFO) and “Income taxes-Foreign” (TXPO).¹¹ Following previous studies on cash holdings, I exclude financial firms (SIC code starting with 6) and utility firms (SIC code starting with 49) because they either hold cash for different purposes or their corporate decisions are heavily regulated. To make sure that the US tax rules indeed apply to firms in my sample, I only include firms incorporated in the US I further require the sample firms to be headquartered in the US, because some US-incorporated firms actually have their major operations in another country. For example, some Chinese firms choose to be incorporated in the US to tap the US capital market, but their entire business is in China, and naturally most of the cash they hold is Renminbi (RMB). It does not make sense to classify such cash as “foreign”.

¹¹ These two items are the only COMPUSTAT variables that can identify the extent of foreign operations (Foley et al., 2007).

The domestic and foreign cash holdings are collected from 10-K filings, and in most cases this breakdown is disclosed in the “Liquidity” section of item 7 – “Management Discussion and Analysis”. Prior studies on cash valuation all use cash and short-term investments in COMPUSTAT (CHE) as the definition for cash. Some firms use a different definition when disclosing foreign cash holdings. Fortunately, firms usually also disclose total cash holdings using their own definition. Here is an example of Valhi Inc.’s 10-K filed on March 17, 2014: “At December 31, 2013, we had an aggregate of \$193.5 million of restricted and unrestricted cash, cash equivalents and marketable securities, 63.2 of which was held outside US” Some of the marketable securities must be long-term, because the value of cash and short-term investments is 157 million in COMPUSTAT. To facilitate the comparison across firms, I make the assumption that the proportion of foreign cash to total cash is the same across all definitions of cash, so foreign cash in this case is calculated as $(63.2/193.5)*157=51.3$ million.¹²

PRE and the repatriation tax (if disclosed) are also collected from 10-K filings, usually under “Income taxes” in “Notes to financial statements.” To further ensure that firms have relatively significant foreign operations such that it is possible for them to have some foreign cash, I only keep firms with positive PRE. Comment letters from the SEC are collected as follows. I first download all the SEC comment letters from EDGAR (filing type is “UPLOAD”) for my sample firms from January 2010 to March 2014. I then write a Perl program to single out the comment letters that mention the word “foreign.” I read all these comment letters and discard the ones unrelated to foreign cash. The other data sources are the usual databases. Financial statement data

¹² About 25% of the sample firms do not use COMPUSTAT’s CHE as definition when disclosing foreign cash holdings. Results are very similar if these observations are excluded.

is from COMPUSTAT, stock return data is from CRSP, institutional ownership data is from Thomson Reuters Institutional Ownership (13-f) database, and analyst data is from I/B/E/S.

Table 2.1, Panel A presents the number of firms in the sample across years. Disclosure of foreign cash in fiscal year 2010 is truly voluntary, and only 12.2% of firms disclose. After the sudden wave of foreign cash comments on filings of fiscal year 2010, disclosure rate jumped from 12.2% in fiscal year 2010 to 48.6% in fiscal year 2011. An increasing number of multinationals became disclosers, with 61% and 68% of them disclosing in fiscal years 2012 and 2013, respectively. The number of foreign cash comments decreased correspondingly. These patterns provide initial evidence that the SEC's review process is effective in changing firms' disclosure of foreign cash holdings.

Panel B shows the distribution of foreign operations. The distributions of domestic and foreign cash are skewed. The average domestic and foreign cash holdings are 708 million and 1232 million, and the median domestic and foreign cash holdings are only 123 million and 167 million. When cash holdings are scaled by total assets, the distributions are much less skewed. On average, domestic cash comprises 10% of total assets, and foreign cash comprises another 10%. The firm with the highest foreign cash holdings, 69.6 billion, is Microsoft, and the firm with the highest domestic cash holdings, 63.8 billion, is GE. Permanently reinvested earnings are on average 15% of total assets, reflecting the large scope of foreign operations. According to firms' own disclosure, the repatriation tax is around 4% of total assets.

2.4. The SEC's comment decision and firms' disclosure decision

This section investigates the dynamics between the SEC and multinational firms concerning the disclosure of foreign cash holdings and asks two questions: (1) How does the SEC choose firms to comment on; and (2) Given the comment (or lack thereof), how do firms respond?

Comments on foreign cash are interesting in the sense that firms' not disclosing foreign cash is not even a disclosure inadequacy. Understanding how the SEC decides which firms to target helps us understand the regulator's interpretation of the foreign cash issue, because presumably the SEC singles out firms whose foreign cash disclosure can aid investors' decision-making the most.

On multinational firms' part, seeing what factors determine foreign cash disclosure reveals the costs and benefits that firms perceive when considering what to tell investors about their foreign cash holdings. Moreover, because of the self-selection, a disclosure determinant model is needed before examining the valuation of foreign cash holdings.

2.4.1. The SEC's comment decision

The SEC review process is mandated by SOX Section 408, which explicitly sets forth several firm characteristics the SEC considers important. Incorporating the findings of Cassell et al. (2013) who study the determinants of the receipt of comment letters (regardless of the specific issues raised by the SEC), I include five aspects in the SEC's comment decision model – factors mentioned by SOX Section 408, profitability, complexity, external corporate governance and internal corporate governance. SOX Section 408 factors include material internal control weakness (*weakness*), restated financial statements (*restatement*), stock return volatility (*highvol*), market capitalization (*size*) and market-to-book ratio (*tobinq*). Profitability is measured by accounting performance (*roa*) and sales growth (*salesgrowth*). Complexity is measured by age (*age*), the number of business segments (*bus_segments*), the number of geographic segments (*geo_segments*), mergers and acquisitions (*ma*), restructuring activities (*restructuring*), external financing (*extfinancing*) and litigation risk (*litigation*). I use Big 4 auditor (*big4*), institutional ownership (*institution*) and analyst following (*analysts*) to measure external corporate governance

mechanisms, and an indicator of whether the CEO is also the Chairman of the board of directors (*duality*) to measure internal corporate governance.¹³

I further predict that variables specifically related to foreign operations or cash holdings will affect the probability of receiving a foreign cash comment. The SEC should prompt firms to disclose foreign cash holdings if their illiquidity is a material issue; that is, the potential repatriation tax is larger. Therefore, firms with non-binding foreign tax credit status (*nonbinding*) are more likely to receive a comment on foreign cash holdings. If firms do disclose the repatriation tax (*taxdisclosure*), however, the SEC should have less incentive to target these firms, because investors already know the costs of using the illiquid foreign cash. Foreign cash holdings should only be an issue when firms hold large amount of total cash to begin with, so I expect that total cash holdings (*totalcash*) are positively related to the probability of receiving a foreign cash comment. Firms with more foreign operations are more likely to concern the SEC because these operations could potentially trap more foreign cash. The designation of PRE is also how most firms get to accumulate offshore cash in the first place.¹⁴ I use PRE (*pre*) to measure the extent of foreign operations. I also include year and industry fixed effects. All variable definitions are detailed in Appendix 1. The Probit model for estimating the probability of receiving a foreign cash comment is as follows:

$$\begin{aligned} \Pr(\text{fcashcomment}_t = 1) = & \Phi(\alpha + \beta_1 \text{weakness}_t + \beta_2 \text{restatement}_t + \beta_3 \text{highvol}_t + \beta_4 \text{size}_t + \beta_5 \text{age}_t + \beta_6 \text{roa}_t \\ & + \beta_7 \text{salegrowth}_t + \beta_8 \text{bus_segments}_t + \beta_9 \text{geo_segments}_t + \beta_{10} \text{tobinq}_t + \beta_{11} \text{ma}_t \\ & + \beta_{12} \text{restructuring}_t + \beta_{13} \text{extfinancing}_t + \beta_{14} \text{litigation}_t + \beta_{15} \text{big4}_t + \beta_{16} \text{institution}_t \\ & + \beta_{17} \text{analysts}_t + \beta_{18} \text{duality}_t + \beta_{19} \text{nonbinding}_t + \beta_{20} \text{totalcash}_t + \beta_{21} \text{pre}_t \\ & + \beta_{22} \text{taxdisclosure}_t + \text{Industry FE} + \text{Year FE} + \varepsilon) \end{aligned} \quad (1)$$

Firms who receive a foreign cash comment on current year's 10-K filings have *fcashcomment*

¹³ Duality is the only significant internal governance determinant in Cassell et al. (2013).

¹⁴ Graham et al. (2011) even use PRE directly as a proxy for foreign cash holdings.

equal to 1, and 0 otherwise. Because firms who already disclose foreign cash holdings are certainly not going to receive a foreign cash comment, I exclude them in this test. The review process for fiscal year 2013 is not yet complete, so I also estimate this model without 2013.

2.4.2. Firms' decision to disclose foreign cash holdings

Given the SEC's comment decision, and firms' understanding of how the SEC makes the decision, firms will react accordingly with other factors of the disclosure decision in mind. If firms can rationally decipher the SEC's decision-making process, they might react pre-emptively by voluntarily disclosing foreign cash holdings even when they have not received a comment yet.¹⁵ Therefore, on top of the SEC's actual comment decision on previous years' 10-K filings (*commentbefore*), I include all the variables in model 1 in the disclosure model. These variables are also important determinants of disclosure in other settings (e.g., Lang and Lundholm, 1993; Li, 2008). The expected signs of several variables are different from model 1, though. I expect *duality* is negatively related to the probability of disclosing foreign cash holdings, although I expect *duality* is positively related to the receipt of a foreign cash comment. More entrenched managers are less likely to accommodate investors' needs for better information, and previous studies find firms with less effective governance are less likely to issue management forecasts (Karamanou and Vafeas, 2005; Ajinkya et al., 2005) and less conservative (Ahmed and Duellman, 2007). Expecting this relation, the SEC is more likely to target these firms on behalf of investors. In a similar vein, although I expect the SEC to pressure firms with high potential repatriation tax, I predict managers of these firms are less likely to disclose. Disclosing foreign cash holdings is essentially revealing a hidden cost, a form of bad news that investors might have been unaware of

¹⁵ It is worth noting that every firm has to be reviewed by the SEC at least once every three years. Since my sample period covers four years, it is not surprising that almost 88% of firms receive comment letters. The issues raised by the SEC in the comment letters can vary drastically though, and that is why it is interesting to investigate the determinants of the specific issues raised.

before, and managers generally tend to withhold bad news (Kothari et al, 2009).¹⁶ The flip side of this argument is that firms object less to disclosing foreign cash holdings if they already divulge the repatriation tax; that is, *taxdisclosure* should be positively related to the likelihood of disclosure.

Brown et al. (2013) document the spillover effect of risk factor comment. To incorporate the possible spillover effect of foreign cash comment, I include a variable *peercomment* that equals 1 if the firm itself does not receive a foreign cash comment, but at least one firm in the same 2-digit SIC industry receives a foreign cash comment on previous year's filings.

I also include several additional variables related to the disclosure decision but not covered by the battery of variables above. In addition to *duality* and *nonbinding*, I add free cash flow (*freecashflow*) as another managerial incentive measure. Thomas and Hope (2008)'s finding that firms not reporting foreign earnings become empire-builders suggests that empire-builders use opaque disclosure to mask their self-serving activities. Empire building is a more severe problem when firms have large amount of free cash flow (Jensen, 1986), and such firms are less likely to promote transparent disclosure. Another important factor related to disclosure is proprietary information. The breakdown of domestic and foreign cash holdings is a more refined disclosure, and firms with higher proprietary costs prefer less refined disclosure. Since proprietary cost proxies at subsidiary level are unavailable, I control for proprietary costs at firm level using R&D expense (*rnd*). The Probit model is as follows:

¹⁶ Although investors might be able to estimate the repatriation tax based on foreign income taxes and pre-tax foreign income, disclosing foreign cash holdings directly is a much more salient way to inform investors of the illiquidity of the cash position. This is especially true considering investors' limited attention and lack of sophistication.

$$\begin{aligned} \Pr(\text{disclosure1}/2_t=1)=\Phi(\alpha+\beta_1\text{commentbefore}_{t-1}+\beta_2\text{peercomment}_{t-1}+\beta_3\text{weakness}_t+\beta_4\text{restatement}_t \\ +\beta_5\text{highvol}_t+\beta_6\text{size}_t+\beta_7\text{age}_t+\beta_8\text{roa}_t+\beta_9\text{salegrowth}_t+\beta_{10}\text{bus_segments}_t \\ +\beta_{11}\text{geo_segments}_t+\beta_{12}\text{tobinq}_t+\beta_{13}\text{ma}_t+\beta_{14}\text{restructuring}_t+\beta_{15}\text{extfinancing}_t \\ +\beta_{16}\text{litigation}_t+\beta_{17}\text{big4}_t+\beta_{18}\text{institution}_t+\beta_{19}\text{analysts}_t+\beta_{20}\text{duality}_t \\ +\beta_{21}\text{nonbinding}_t+\beta_{22}\text{totalcash}_t+\beta_{23}\text{pre}_t+\beta_{24}\text{taxdisclosure}_t+\beta_{25}\text{freecashflow}_t \\ +\beta_{26}\text{rnd}_t+\text{Industry FE}+\text{Year FE}+\varepsilon_t) \end{aligned} \quad (2)$$

The dependent variable is either *disclosure1*, which equals 1 for quantitative disclosure of foreign cash holdings or *disclosure2*, which equals 1 for both quantitative and qualitative disclosure, as some firms only describe the extent of foreign cash holdings (e.g., majority of the cash is held in foreign subsidiaries). The first determinant, *commentbefore*, is the SEC’s comment decision on previous years’ 10-K filings.¹⁷ Since the SEC issued no foreign cash comment when reviewing 10-K filings of fiscal year 2009, all the observations in fiscal year 2010 have *commentbefore* equal to 0. I run model 2 both with and without fiscal year 2010.

2.4.3. Results of the Probit models

Table 2.2, Panel A reports the descriptive statistics of the variables used in the Probit models. About 45% of firms choose to disclose the exact amount of foreign cash and 3% of firms only disclose qualitatively. Fewer firms disclose the repatriation tax, only 15%. Firms in my sample are generally large, old and well-followed by analysts and mostly held by institutions, with a low rate of internal control material weakness (3%) and restatement (5%). Consistent with the idea that multinational firms are complex, 41% of them are involved in M&A activities and 53% of them undergo restructuring. There are 71% of firms with non-binding foreign tax credit status, suggesting that most firms will incur the repatriation tax if they want to access foreign cash.

¹⁷ One can argue that in place of *commentbefore* the determinant could be the probability of getting a comment on foreign cash from the SEC, i.e. the predicted probability from model (1). However, only firms who do not disclose foreign cash holdings can be included in model (1), so the predicted probability of getting a foreign cash comment is only available for these firms. Including the predicted probability in model (2) means the model can only be run among firms who have not disclosed foreign cash holdings in previous years.

Table 2.3 presents the results of the SEC's comment decision. I first only include the general factors affecting the receipt of comment letters in column 1. Consistent with intuition, larger firms are more likely to be targeted. Contrary to the SEC's claim, firms with lower Tobin's Q are more likely to receive a foreign cash comment, but it is exactly low growth firms who tend to accumulate piles of cash because they have limited projects on which to spend money. The negative coefficient on *salesgrowth* further confirms this argument. Firms with fewer business segments and M&A activities are more likely to receive a foreign cash comment, possibly also due to lower growth. It is worth noting that many variables in Cassell et al. (2013) are insignificant here because most firms receive comment letters (with or without foreign cash comment in them) in my sample.¹⁸ In column 2, I add variables more related to foreign cash holdings. The coefficients of *totalcash* and *nonbinding* are not insignificant. Firms with higher permanently reinvested earnings are more likely to receive a comment, and one standard deviation increase in *pre* is associated with 2.2% increase in the probability of being commented on. Disclosing the repatriation tax decreases the probability of receiving a comment by almost 4%.

Table 2.4 provides the results of firms' disclosure decision. The dependent variable is *disclosure1* in the first two columns and *disclosure2* in the last two columns. Receiving a foreign cash comment before increases the probability of disclosure by almost 21%-26%, depending on the specification. Having a peer receive a comment letter increases the probability of disclosure by 8%, although it is insignificant in column 2. Many other factors also play important roles. Firms restating their financial statements are 9% less likely to disclose foreign cash holdings, suggesting transparency is lacking for these firms generally. Larger firms, lower growth firms, and more complex firms with a greater number of business segments and M&A activities are more likely to

¹⁸ I also exclude firms that never receive a comment letter in my sample period so that all the firms receive at least one comment letter (with or without foreign cash comment). The results are qualitatively the same.

disclose foreign cash holdings. Firms who hire Big 4 auditors are 11% more likely to disclose. Firms with high cash holdings and permanently reinvested earnings are more inclined to disclose foreign cash. The coefficient of *duality* is significantly negative, indicating an entrenched CEO is 4.6% less likely to disclose. Further supporting the managerial incentive's effect on disclosure, *freecashflow* is also negative as predicted, although only significantly so in column 2. The coefficient of *nonbinding* is insignificant. Results are similar for *disclosure1* versus *disclosure2*, although the comment letters' spillover effect is more prominent and the number of geographic segments is also positive for *disclosure2*.

2.5. Valuation of disclosed domestic and foreign cash holdings

Having established the disclosure decision by multinational firms conditional on the SEC's intervention, I now move on to the more important task of this paper: the study of how equityholders value foreign cash holdings, using domestic cash holdings as a natural benchmark. The section starts with the models and the results on how foreign cash is valued for a given firm, followed by the cross-sectional variation in firms' characteristics on the value of foreign cash.

2.5.1. Models

Most prior papers on cash valuation use a variant of the model first introduced by Faulkender and Wang (2006). The dependent variable is contemporaneous abnormal returns, and the variable of interest is the change in total cash holdings scaled by market value of equity at the beginning of the year ($\Delta cash$). The coefficient of $\Delta cash$ translates to the market value of one extra dollar of cash. To measure the valuation of domestic and foreign cash holdings, I split $\Delta cash$ into the change in domestic cash holdings, $\Delta dcash$, and the change in foreign cash holdings, $\Delta fcash$. Only firms who disclose the foreign versus domestic breakdown can enter the valuation model. I

employ Heckman two-stage model to control for the self-selection, and the first-stage selection model is the model used in column 1 of Table 2.4.¹⁹ The valuation model is as follows²⁰:

$$ar_{i,t} = \alpha_0 + \alpha_1 \Delta dcash_{i,t} + \alpha_2 \Delta fcash_{i,t} + \alpha_3 \Delta domearnings_{i,t} + \alpha_4 \Delta forearnings_{i,t} + \alpha_5 \Delta netassets_{i,t} + \alpha_6 \Delta rd_{i,t} + \alpha_7 \Delta interest_{i,t} + \alpha_8 \Delta dividends_{i,t} + \alpha_9 cash_{i,t-1} + \alpha_{10} lev_{i,t} + \alpha_{11} netfinancing_{i,t} + \alpha_{12} \Delta cash_{i,t} \times cash_{i,t-1} + \alpha_{13} \Delta cash_{i,t} \times lev_{i,t} + \alpha_{14} \log_assets_{i,t} + \alpha_{15} Mills + industry\ FEs + year\ FEs + \varepsilon_{i,t} \quad (3)$$

The dependent variable $ar_{i,t}$ is the buy-and-hold returns of firm i during fiscal year t minus the buy-and-hold returns of the corresponding Fama-French 5×5 portfolio to which firm i belongs.²¹ Δx is the change in variable x from fiscal year $t-1$ to t . $dcash$ is domestic cash, $fcash$ is foreign cash, and they add up to total cash. $domearnings$ is domestic earnings, which is calculated as earnings before extraordinary items minus $forearnings$. $forearnings$ is foreign after-tax earnings. $netassets$ is total assets net of cash. rd is research and development expense, and missing values in COMPUSTAT are treated as zero. $interest$ is interest expense. $dividends$ is common dividends. $cash_{i,t-1}$ is the lagged cash holdings. lev is market leverage, which is the sum of short- and long-term debt divided by sum of short- and long-term debt and market value of equity. $netfinancing$ is the sum of new equity issues and new debt issues. \log_assets is log of total assets. $Mills$ is the inverse Mill's ratios from the selection model. Except lev , \log_assets and $Mills$, all the other independent variables are scaled by market value of equity at the beginning of fiscal year t . The comparison between α_1 and α_2 answers how foreign cash is valued relative to domestic cash.

¹⁹ Because most variables in the selection model are levels and most variables in the valuation model are changes, technically there is no overlap in the independent variables in the two models. Still, most of the variables in the selection model are expected to affect valuation. It is reasonable to assume that the SEC's comment decision on firms' peers is exogenous to firms' own valuation, so peer firms' receipt of foreign cash comment should serve the identification purpose.

²⁰ I do not include PRE in the model because PRE is part of foreign earnings, already included in the model. Including PRE or ΔPRE in the model does not change any conclusion.

²¹ Because Fama-French 5×5 portfolios are formed at the end of every June but firm i 's fiscal year end can be any month, it is possible that the assignment of the portfolio changes during fiscal year t . Also, lagging the yearly returns by three months following the fiscal year end does not change any conclusion.

In addition to model 3, I evaluate three other specifications. CDKS and Thakor estimate the following model:

$$\begin{aligned}
 ar_{i,t} = & \alpha_0 + \alpha_1 \Delta cash_{i,t} + \alpha_2 dcash_{i,t-1} + \alpha_3 fcash_{i,t-1} + \alpha_4 \Delta cash_{i,t} \times dcash_{i,t-1} + \alpha_5 \Delta cash_{i,t} \times fcash_{i,t-1} + \\
 & \alpha_6 \Delta domearnings_{i,t} + \alpha_7 \Delta forearnings_{i,t} + \alpha_8 \Delta netassets_{i,t} + \alpha_9 \Delta rd_{i,t} + \alpha_{10} \Delta interest_{i,t} + \\
 & \alpha_{11} \Delta dividends_{i,t} + \alpha_{12} lev_{i,t} + \alpha_{13} netfinancing_{i,t} + \alpha_{14} \Delta cash_{i,t} \times lev_{i,t} + \alpha_{15} log_assets_{i,t} + \\
 & \alpha_{16} Mills + industry FEs + year FEs + \varepsilon_{i,t}
 \end{aligned} \tag{4}$$

They focus on the comparison between the coefficients of $\Delta cash_{i,t} \times dcash_{i,t-1}$ and $\Delta cash_{i,t} \times fcash_{i,t-1}$. In the original model of Faulkender and Wang (2006), the coefficient of $\Delta cash_{i,t} \times cash_{i,t-1}$ is negative due to the agency costs of free cash flow.²² CDKS decompose this interaction into $\Delta cash_{i,t} \times dcash_{i,t-1}$ and $\Delta cash_{i,t} \times fcash_{i,t-1}$, and argue that a more negative coefficient on the latter will support the idea that foreign cash is valued less than domestic cash.

A closer look at this specification, however, reveals that it does not answer how foreign cash is valued relative to domestic cash. How one dollar of domestic or foreign cash translates to market value is measured by the coefficients of $\Delta dcash_{i,t}$ and $\Delta fcash_{i,t}$, not by the coefficients of $\Delta cash_{i,t} \times dcash_{i,t-1}$ and $\Delta cash_{i,t} \times fcash_{i,t-1}$. The coefficients of $\Delta cash_{i,t} \times dcash_{i,t-1}$ and $\Delta cash_{i,t} \times fcash_{i,t-1}$ do not have a clear meaning. If $\Delta cash_{i,t}$ is one dollar, does this one dollar change come from domestic or foreign operations? Suppose the coefficient of $\Delta cash_{i,t} \times fcash_{i,t-1}$ is negative, and suppose $\Delta cash_{i,t}$ is all attributed to the change in domestic cash. Then why would the change in domestic cash's effect on market value depend on the existing foreign cash stock? I estimate this specification for the sake of completeness.

Although $\Delta cash_{i,t} \times dcash_{i,t-1}$ and $\Delta cash_{i,t} \times fcash_{i,t-1}$ do not have an intuitive meaning, $\Delta dcash_{i,t} \times dcash_{i,t-1}$ and $\Delta fcash_{i,t} \times fcash_{i,t-1}$ do – they essentially condition the value of one

²² The idea is that if the lagged cash holdings are already high, one extra dollar of cash is not going to be invested in positive NPV projects and might end up being wasted on managers' empire-building, so this one dollar is worth less than one dollar.

additional dollar of domestic and foreign cash on the existing domestic and foreign cash stock.

Therefore, I break *cash* into *dcash* and *fcash* everywhere in model (4). The model is:

$$\begin{aligned} ar_{i,t} = & \alpha_0 + \alpha_1 \Delta dcash_{i,t} + \alpha_2 \Delta fcash_{i,t} + \alpha_3 \Delta domearnings_{i,t} + \alpha_4 \Delta forearnings_{i,t} + \\ & \alpha_5 \Delta netassets_{i,t} + \alpha_6 \Delta rd_{i,t} + \alpha_7 \Delta interest_{i,t} + \alpha_8 \Delta dividends_{i,t} + \alpha_9 dcash_{i,t-1} + \\ & \alpha_{10} fcash_{i,t-1} + \alpha_{11} lev_{i,t} + \alpha_{12} netfinancing_{i,t} + \alpha_{13} \Delta dcash_{i,t} \times dcash_{i,t-1} + \\ & \alpha_{14} \Delta fcash_{i,t} \times fcash_{i,t-1} + \alpha_{15} \Delta dcash_{i,t} \times lev_{i,t} + \alpha_{16} \Delta fcash_{i,t} \times lev_{i,t} + \\ & \alpha_{17} \log_assets_{i,t} + \alpha_{18} Mills + industry FEs + year FEs + \varepsilon_{i,t} \end{aligned} \quad (5)$$

In this model, the comparison between α_1 and α_2 shows for a given firm how foreign cash and domestic cash are valued, and α_{13} and α_{14} show to what extent does the value of an additional dollar of domestic and foreign cash depend on the existing level of domestic and foreign cash.

The final variation I make to the model is to split $\Delta cash$ into $\Delta dcash$ and $\Delta fcash$ in CDKS and Thakor's model (model 4 above).²³ Besides the comparison between the coefficients of $\Delta dcash_{i,t} \times dcash_{i,t-1}$ and $\Delta fcash_{i,t} \times fcash_{i,t-1}$ they examine, I can also examine the coefficients of $\Delta dcash$ and $\Delta fcash$ in the same model:

$$\begin{aligned} ar_{i,t} = & \alpha_0 + \alpha_1 \Delta dcash_{i,t} + \alpha_2 \Delta fcash_{i,t} + \alpha_3 dcash_{i,t-1} + \alpha_4 fcash_{i,t-1} + \alpha_5 \Delta dcash_{i,t} \times dcash_{i,t-1} + \\ & \alpha_6 \Delta fcash_{i,t} \times fcash_{i,t-1} + \alpha_7 \Delta domearnings_{i,t} + \alpha_8 \Delta forearnings_{i,t} + \alpha_9 \Delta netassets_{i,t} + \\ & \alpha_{10} \Delta rd_{i,t} + \alpha_{11} \Delta interest_{i,t} + \alpha_{12} \Delta dividends_{i,t} + \alpha_{13} lev_{i,t} + \alpha_{14} netfinancing_{i,t} + \\ & \alpha_{15} \Delta dcash_{i,t} \times lev_{i,t} + \alpha_{16} \log_assets_{i,t} + \alpha_{17} Mills + industry FEs + year FEs + \varepsilon_{i,t} \end{aligned} \quad (6)$$

2.5.2. Main results

In Table 2.5, column 1 reports the result of estimating model 3. The coefficient of $\Delta dcash_{i,t}$ is 1.211, and the coefficient of $\Delta fcash_{i,t}$ is a slightly bigger 1.236, but the coefficients are not significantly different from each other. This result suggests that foreign cash is valued similarly to

²³ The downside of model 5 is that there are many interactions involving domestic and foreign cash. Domestic cash and foreign cash are highly correlated both in level and change forms, and so are the interactions involving them. Therefore, I use model 3 in the following tests with respect to cross-sectional variation in firms' characteristics.

the same firm's domestic cash. It appears that the positive effect of high growth opportunities cancels out the negative effects of the repatriation tax and agency problems.

CDKS and Thakor's specification (model 4) is in column 2. I find results consistent with CDKS and inconsistent with Thakor – the coefficient of $\Delta cash_{i,t} \times fcash_{i,t-1}$ is significantly more negative than $\Delta cash_{i,t} \times dcash_{i,t-1}$ at 1% level. The fact that I can replicate CDKS' result using my sample and their specification makes an important point: although my sample is relatively small, the test still has power. The difference between my conclusion using model 3 and CDKS' conclusion using model 4 can only be attributed to the specification.

Column 3 of Table 2.5 reports the results of model 5. I find the negative coefficient of $\Delta cash_{i,t} \times fcash_{i,t-1}$ in CDKS' regression actually captures the effect of $\Delta fcash_{i,t} \times fcash_{i,t-1}$. The negative coefficient of $\Delta fcash_{i,t} \times fcash_{i,t-1}$ indicates that when foreign subsidiaries have already accumulated a lot of cash, one extra dollar of foreign cash is not going to add much value to the firm, presumably because it is more likely to be abused. Holding a lot of foreign cash indicates that these subsidiaries have not found investment opportunities, arguably the very reason that could make foreign cash more valuable than domestic cash. $\Delta fcash_{i,t} \times fcash_{i,t-1}$ (or in CDKS' case, $\Delta cash_{i,t} \times fcash_{i,t-1}$), however, does not tell us *directly* how foreign cash is valued relative to domestic cash. In this specification, the coefficient of $\Delta fcash_{i,t}$, 2.054, is actually weakly different from the coefficient of $\Delta dcash_{i,t}$, 0.869. However, due to the interactions in this specification (namely the interactions with $dcash_{i,t-1}$, $fcash_{i,t-1}$ and $lev_{i,t}$), the coefficients of $\Delta fcash_{i,t}$ and $\Delta dcash_{i,t}$ do not represent the market value of one additional dollar of domestic and foreign cash directly. I multiply the coefficients of the interactions and the mean of $dcash_{i,t-1}$, $fcash_{i,t-1}$ and $lev_{i,t}$, and add the results to the main coefficients of $\Delta fcash_{i,t}$ and $\Delta dcash_{i,t}$. For an average multinational firm, one dollar of domestic cash is valued 1.268, and one dollar of foreign cash is valued 1.801 (p value

of the F test is 0.2846). Once again, foreign cash is valued higher than domestic cash but not statistically so. I also try excluding all the interactions, and the (unreported) coefficients of $\Delta fcash_{i,t}$ and $\Delta dcash_{i,t}$ are 1.373 and 1.323 respectively, not significantly different. Foreign cash is by no means discounted relative to domestic cash *for the same firm*.

The last column shows the result of model 6. $\Delta fcash_{i,t}$ has a bigger, albeit insignificantly different, coefficient than $\Delta dcash_{i,t}$, reaffirming what has been found so far. The coefficient of $\Delta cash_{i,t} \times fcash_{i,t-1}$ is still significantly more negative than $\Delta cash_{i,t} \times dcash_{i,t-1}$.

Consistent with prior literature, in all the models $\Delta forearnings_{i,t}$ is significantly positive and has coefficient larger than 1, but $\Delta domearnings_{i,t}$ is never significantly different from 0. Along with the comparison between coefficients of $\Delta fcash_{i,t}$ and $\Delta dcash_{i,t}$, there is no evidence suggesting investors discount any aspect of foreign operations.

Overall, the results show that the benefits of keeping cash offshore must be significant enough to counterbalance the downsides. At first glance, the results seem to be at odds with the findings of Hanlon et al. (forthcoming) and Edwards et al. (forthcoming) who indicate that foreign investment funded by foreign cash is not very efficient. However, their studies look at foreign cash that is actually spent, but my study focuses on foreign cash that has not been spent yet. In fact, to support both studies' finding that market reactions to the announcement of foreign investment are negative, investors must have expected the unspent foreign cash to be used on favorable foreign investment opportunities to begin with, but get disappointed when the investment is actually revealed. In other words, my finding documents the expectation of the use of foreign cash, and Hanlon et al. (forthcoming) and Edwards et al. (forthcoming) document the realization of the use of foreign cash.

An alternative explanation is the difference in sample periods. I examine the recent years when foreign cash is closely watched by the policy makers and the media, and the disclosure of foreign cash has gradually become the new norm. With this level of publicity, managers might become more disciplined in using foreign cash. Most years in the samples of Hanlon et al. (forthcoming) and Edwards et al. (forthcoming) are before the public's sudden interest in foreign cash, and the opaqueness associated with foreign cash provides opportunities to abuse it.

2.5.3. Firms' characteristics and the valuation of foreign cash holdings

This section explores the cross-sectional variation in firms' characteristics that affect the value of foreign cash differently than domestic cash, including the repatriation tax, agency problems of foreign operations and foreign growth opportunities. I expand model 3 as follows:

$$ar_{i,t} = \alpha_0 + \alpha_1 \Delta \text{cash}_{i,t} + \alpha_2 \Delta \text{fcash}_{i,t} + \alpha_3 \text{characteristic}_{i,t} + \alpha_4 \Delta \text{cash}_{i,t} \times \text{characteristic}_{i,t} + \alpha_5 \Delta \text{fcash}_{i,t} \times \text{characteristic}_{i,t} + \alpha_6 \Delta \text{domearnings}_{i,t} + \alpha_7 \Delta \text{forearnings}_{i,t} + \alpha_8 \Delta \text{netassets}_{i,t} + \alpha_9 \Delta \text{rd}_{i,t} + \alpha_{10} \Delta \text{interest}_{i,t} + \alpha_{11} \Delta \text{dividends}_{i,t} + \alpha_{12} \text{cash}_{i,t-1} + \alpha_{13} \text{lev}_{i,t} + \alpha_{14} \text{netfinancing}_{i,t} + \alpha_{15} \Delta \text{cash}_{i,t} \times \text{cash}_{i,t-1} + \alpha_{16} \Delta \text{cash}_{i,t} \times \text{lev}_{i,t} + \alpha_{17} \log_assets_{i,t} + \alpha_{18} \text{Mills} + \text{industry FEs} + \text{year FEs} + \varepsilon_{i,t} \quad (7)$$

characteristic_{i,t} is one of the firm characteristics detailed below. The coefficient of interest is α_5 .

2.5.3.1. Repatriation tax

The first measure of the repatriation tax is firms' nonbinding foreign tax credit status, used in prior tax literature (Klassen and Laplante, 2012; Krull, 2004). The variable, *nonbinding*, is equal to 1 if firms' estimated foreign tax rate is less than the US statutory tax rate 35% and 0 otherwise.²⁴ Foreign tax rate is the average of foreign income tax/foreign pretax income over 1 and up to 5 years.²⁵ The second measure is the indicator variable, *taxdisclosure*, for voluntary disclosure of

²⁴ Foreign income can sometimes be negative. I follow prior literature and truncate the calculated foreign tax rate at zero and one.

²⁵ Using the current year's estimated foreign tax rate does not change the results. Sometimes the estimated foreign tax rate is bigger than 35% but the firm actually discloses its expected repatriation tax in the 10-K filings. I will change nonbinding from 0 to 1 when this is the case. Using (35%-foreign tax rate) rather than the indicator variable *nonbinding* generates similar results. I also try using marginal tax rate calculated by Graham (1996) instead of 35% in a smaller sample, and the results are very similar.

the repatriation tax in 10-K filings. The test variable is $\Delta fcash_{i,t} \times nonbinding_{i,t}$ or $\Delta fcash_{i,t} \times taxdisclosure_{i,t}$. If the repatriation tax affects the valuation of foreign cash holdings (either through the tax channel or through the investment distortion channel), and the two proxies can accurately reflect the extent of the repatriation tax, α_5 will be negative. I do not expect the valuation of domestic cash holdings to depend on the repatriation tax, i.e., α_4 is expected to be insignificant.

Table 2.6 reports the results. In the first column, the interaction $\Delta fcash_{i,t} \times nonbinding_{i,t}$ is positive but insignificant, and surprisingly, the interaction $\Delta dcash_{i,t} \times nonbinding_{i,t}$ is significantly positive. This pattern also holds true in the second column where $taxdisclosure_{i,t}$ is the proxy for the repatriation tax. Both $\Delta dcash_{i,t} \times taxdisclosure_{i,t}$ and $\Delta fcash_{i,t} \times taxdisclosure_{i,t}$ are significantly positive. Neither proxy generates the expected negative coefficient. These results are inconsistent with the conclusion of Chen (2014), who finds that the valuation of *total* cash holdings decreases in the repatriation tax. One likely explanation is that neither $nonbinding_{i,t}$ nor $taxdisclosure_{i,t}$ captures only the repatriation tax, or at least the repatriation tax investors expect firms to actually pay. The insignificant coefficient of $\Delta fcash_{i,t} \times nonbinding_{i,t}$ is somewhat consistent with Howard (2014) who finds investors in my sample period anticipate another tax holiday and do not expect to pay much of the repatriation tax. It might also indicate that the repatriation tax status is correlated with other institutional factors of low-tax foreign countries that can offset the negative effect of the repatriation tax on foreign cash. The result in the second column implies that firms who voluntarily disclose the repatriation tax are more transparent in general, such that their cash holdings, domestic or foreign, are valued higher.²⁶

²⁶ Huang and Zhang (2012) also find total cash holdings are more valuable for more transparent firms, using AIMR score to measure transparency.

2.5.4. Agency problems of foreign operations

I assess agency problems of foreign operations through three aspects – the disclosure, the organizational complexity, and the location of decision-rights. The degree to which firms hide foreign subsidiaries from investors is used to measure the disclosure aspect of foreign operations. I use two variables that require different levels of reasoning from investors. The first variable, $noex21_{i,t}$, is an indicator variable equal to 1 if the firm does not mention foreign subsidiaries in Exhibit 21 or does not file Exhibit 21. This variable does not demand too much of investors' ability to know the truth about the actual number of foreign subsidiaries because not showing any foreign subsidiaries is very likely to indicate firms are withholding information.²⁷ The second variable asks more from investors. I extract foreign subsidiaries from the OSIRIS international database and use this information as a proxy for all significant foreign operations. OSIRIS collects foreign subsidiaries through different countries' company registries, because even private firms like subsidiaries need to register with a foreign local registry. This is not a perfect proxy, however, because the comprehensiveness of foreign subsidiaries depends on data provider's data collection ability.²⁸ Some subsidiaries in OSIRIS are not really firms, such as foundations, research institutes and pension funds. I delete all these observations, and other subsidiaries not controlled by the US parent (i.e., ownership is below 50%). The OSIRIS database is also not a complete panel; the current version identifies foreign subsidiaries on varying dates, from 2010-2014. The program I use on Exhibit 21 can only count country names, and cannot accurately count the number of foreign subsidiaries because often a country name appears in subsidiary name once and in location once. I therefore count the number of unique foreign countries in OSIRIS and Exhibit 21, and decide whether firms choose to underreport foreign subsidiaries by comparing these two. To facilitate

²⁷ I only keep firms with positive PRE in my sample, so all of them should have at least some significant foreign operations.

²⁸ There are some cases where firms disclose more foreign subsidiaries in Exhibit 21 than the OSIRIS database.

comparison, I count the number of foreign countries in Exhibit 21 of fiscal year 2010 through 2013 combined. If the number in Exhibit 21 is lower than the number in OSIRIS, the indicator variable, $hide_i$, is set to 1. Although not perfect, this measure does pick up the cases where rather sizable firms only report very few foreign subsidiaries.

The next variable, $forcountries_{i,t}$, measures the organizational complexity. $forcountries_{i,t}$ is the number of distinct foreign countries where firms have significant operations.²⁹ The last variable, $central_{i,t}$, measures agency problems within multinational firms. Following Robinson and Stocken (2013), the decision-rights are considered decentralized if foreign subsidiaries use the local currency rather than the US dollar as the functional currency.³⁰ Such practice will result in non-zero translation adjustment in accumulated comprehensive income, and the consolidated translation adjustment is the change in COMPUSTAT item RECTA. Firms with zero change in RECTA are considered having centralized decision-rights, with $central_{i,t}$ equal to 1.

Table 2.7 reports the results. In the first column, the proxy is $noex21_{i,t}$. As predicted in hypothesis 3, the interaction between $noex21_{i,t}$ and $\Delta fcash_{i,t}$ is significantly negative, and the interaction between $noex21_{i,t}$ and $\Delta dcash_{i,t}$ is not significant. The caveat here is that my sample is relatively small, and only 4% of the sample fails to report any foreign subsidiaries. The coefficient of $\Delta fcash_{i,t} \times noex21_{i,t}$, -2.013, is rather negative, and the coefficient on $\Delta fcash_{i,t} + \Delta fcash_{i,t} \times noex21_{i,t}$ is not significantly different from 0. The magnitude basically says foreign cash has no value if firms do not disclose any foreign subsidiaries in Exhibit 21. The second

²⁹ I use the number of foreign countries disclosed in Exhibit 21 rather than the number of foreign countries reported in the OSIRIS database because the former is what investors actually have. Another reason is the OSIRIS data are cross-sectional with subsidiaries identified at different times between 2010 and 2014. Using the number of foreign countries in the OSIRIS generates qualitatively similar results.

³⁰ It is possible that the choice of the functional currency is related to local growth opportunities. For example, some emerging markets have high growth but volatile local currency, so multinational firms that operate in these markets might prefer using the U.S. dollar as the functional currency in financial reporting. In other words, the centralized decision-rights might pick up foreign growth opportunities. To address this issue, I control for foreign growth in the valuation model, and the conclusion stays the same.

proxy for disclosure $hide_i$ is in the second column. The coefficient on $\Delta fcash_{i,t} \times hide_i$ is significantly negative and the coefficient on $\Delta fcash_{i,t} + \Delta fcash_{i,t} \times hide_i$ is not significantly different from 0. Almost 30% of firms are identified as underreporting foreign subsidiaries according to this variable, so this result reinforces the finding in the first column. In the third column, the test variable is $forcountries_{i,t}$. The interaction $\Delta fcash_{i,t} \times forcountries_{i,t}$ is negative, as predicted at the 10% percent level. The coefficient suggests that if the firm operates in one more foreign country, one dollar in foreign cash loses 5 cents in value in the eyes of investors. In the last column, the proxy is the location of decision-rights, $central_{i,t}$. The interaction $\Delta fcash_{i,t} \times central_{i,t}$ is significantly positive and the interaction $\Delta dcash_{i,t} \times central_{i,t}$ is insignificant. Foreign cash in firms with centralized decision-rights is valued twice as high as foreign cash in decentralized firms.

2.5.5. Foreign growth opportunities

The main results in Table 2.5 imply that foreign growth opportunities must be significant. This section explicitly explores the effect of foreign growth opportunities on the valuation of foreign cash holdings. The majority of multinational firms reports geographic segment sales. I use sales growth in non-US segments to measure foreign growth opportunities. I also calculate sales growth in US segments, and use it as a corroborating test because presumably the valuation of foreign cash holdings should not vary with domestic growth opportunities. I expect α_5 to be positive when $characteristic_{i,t}$ is foreign growth, $forgrowth_{i,t}$, and insignificant when $characteristic_{i,t}$ is domestic growth, $domgrowth_{i,t}$.

Table 2.8 presents the results. In the first column, the interaction $\Delta fcash_{i,t} \times forgrowth_{i,t}$ is highly significant at 1% level. The coefficient of $\Delta fcash_{i,t} \times forgrowth_{i,t}$ indicates 1% foreign sales growth is associated with 5 cents additional value for each foreign dollar. Interestingly, $\Delta dcash_{i,t} \times forgrowth_{i,t}$ is also significantly positive at 5% level, although the coefficient is smaller

than $\Delta fcash_{i,t} \times forgrowth_{i,t}$. Desai et al. (2009) find that investment in foreign subsidiaries stimulates investment in domestic operations. The positive coefficient on $\Delta dcash_{i,t} \times forgrowth_{i,t}$ seems to suggest that higher foreign growth opportunities benefit the US as well, making domestic cash holdings more valuable. When I replace $forgrowth_{i,t}$ with $domgrowth_{i,t}$ in the second column, $\Delta fcash_{i,t} \times domgrowth_{i,t}$ is insignificant as expected, but even $\Delta dcash_{i,t} \times domgrowth_{i,t}$ is insignificant. Note that $forgrowth_{i,t}$ is also significantly positive but $domgrowth_{i,t}$ is not. The results essentially suggest that investors not only value foreign growth more than domestic growth, but also condition the valuation of cash holdings on foreign growth but not on domestic growth. The descriptive statistics in Table 2.2, Panel B might partially explain investors' fixation on foreign growth – the average foreign sales growth is more than 11% but the average domestic sales growth is less than 5%.

2.6. Foreign cash estimates

Using the time period before firms widely disclose foreign cash holdings, Thakor (2013) and CDKS (2014) develop two rather different methods to estimate foreign cash holdings. They both use variations on model 4 above, but arrive at opposite conclusions. Since their sample selection and period are also different, it is hard to pin down the cause of the different conclusions. I apply both methods to my sample firms to eliminate the sample difference, and re-examine the valuation of the estimated foreign cash holdings. This section discusses the results.

The (unreported) Pearson correlations between Thakor's domestic and foreign cash estimates and the actual domestic and foreign cash (voluntarily disclosed) are 0.81 and 0.58, respectively. Pearson correlations between CDKS' domestic and foreign estimates and the actual domestic and foreign cash are 0.57 and 0.56, respectively. It seems that Thakor's method provides a more accurate breakdown of total cash.

Table 2.9, Panel A reports the results of model 4, with Thakor's estimates in column 1 and CDKS's estimates in column 2. In column 1, neither $\Delta cash \times dcash_estimate_{i,t-1}$ nor $\Delta cash \times fcash_estimate_{i,t-1}$ is significant. The F-test shows that the two interactions are not significantly different from each other either. The results in column 2, however, are consistent with CDKS' findings – $\Delta cash \times fcash_estimate_{i,t-1}$ is significantly more negative than $\Delta cash \times dcash_estimate_{i,t-1}$. Even with the same sample and model specification, the two estimates still generate different conclusions, so the culprit has to be the methods of estimating foreign cash.

Table 2.9, Panel B reports the results of estimating model 3, my revised specification. Interestingly, Thakor's estimates generate the result that foreign cash is valued more than domestic cash, exactly Thakor (2013)'s conclusion. On the contrary, CDKS' estimates show that foreign cash and domestic cash are valued similarly, my main finding in Table 2.5 using actual foreign and domestic cash holdings.

To sum up, valuing estimated foreign cash holdings is sensitive to the estimation method. The results suggest that CDKS' estimates behave more closely as the actual values in the valuation models than Thakor's estimates, although the correlations suggest otherwise.

2.7. Treasury's crackdown on inversions and market reactions

Recently, the market has witnessed a new wave of inversion deals in which a US firm acquires a foreign target and relocates overseas for tax purposes. US multinationals are incentivized to invert to avoid paying US taxes on future foreign earnings, but more importantly, they can also potentially escape the repatriation tax on existing foreign earnings (Fleischer, 2014). Because foreign cash becomes cheaper to use for the soon-to-be inverted firms, inversions are

largely funded by foreign cash.³¹ Therefore, inversions are especially attractive to firms who have accumulated a large amount of foreign cash.

In the wake of this new trend, on September 22, 2014, the Treasury Department issued a notice of proposed regulations aimed at reducing some of the tax benefits of inversions. Treasury achieves this goal by making it much harder for inverted firms to avoid the repatriation tax on existing foreign earnings.³² This regulation shock not only affects US multinationals with pending inversions, but also affects other multinationals that could have considered inversions. Treasury's crackdown also signals the regulator's determination to curb repatriation tax avoidance in general. Foreign-cash-rich firms might be negatively affected by Treasury's announcement because the repatriation tax becomes harder to circumvent.

The reduced tax benefits of inversions, however, imply that the new rules will help deter deals that lack synergy (Fleischer, 2014), so Treasury's announcement might not be unequivocally bad news. Arguably, the deterrent effect is more prominent for foreign-cash-rich firms who are more likely to engage in deals purely driven by tax purposes.

I examine US multinationals' market reactions to Treasury's announcement on September 22, 2014. Specifically, I separate firms who are involved in inversions and firms who are not, as the change in investors' expectations caused by Treasury's announcement is clearly different. I further split firms into high (low) foreign cash group if their foreign cash to total cash ratio is above (below) the median. Since a sizable percentage of firms does not disclose foreign cash holdings, I put them in a separate group. Acquirers in pending inversions or firms who indicate interest in

³¹ After Treasury's new rules, Medtronic decided to follow through with its acquisition of Covidien, but it would have to borrow 16 billion to finance the deal rather than using foreign cash, as it had previously planned (Mattioli and Rockoff, 2014).

³² In fact, three out of the four actions in the "Fact Sheet" issued by Treasury illegalize some of the strategies inverted firms might use to avoid the repatriation tax.

inversions are listed in Table 2.10, Panel A. Four of them disclose foreign cash holdings in the most recent filings, and as expected, they all have a significant amount of cash trapped overseas.

Market-adjusted returns on September 22, 2014 are reported in Panel B of Table 2.10.³³ Not surprisingly, firms related to inversions fall by -0.61%, but other multinationals unrelated to inversions also fall by a comparable -0.50%. Interestingly, the loss among multinationals not involved in inversions is significantly more negative for firms who do not disclose foreign cash holdings (-0.77%) than firms who do (-0.33%). Among the disclosers, the low foreign cash group falls by a bigger amount (-0.50%) than the high foreign cash group (-0.17%), although the difference is not statistically significant. Assuming that the non-disclosers on average have lower foreign cash holdings than the disclosers, this pattern essentially says that multinationals with higher foreign cash holdings lose less from Treasury's crackdown. The results together suggest that the market interprets the regulation shock as a more general signal to curb tax avoidance on foreign cash, since all the multinationals suffer losses. Firms with high foreign cash holdings suffer less, although they are more likely to consider inversions. A possible explanation is that Treasury's new rules help prevent these firms from engaging in deals only designed to avoid taxes.³⁴

2.8. Conclusion

US multinational firms hold over half their cash in foreign countries, presumably because bringing back foreign earnings triggers the repatriation tax. This phenomenon stokes heated discussions among policy makers on whether the current tax code distorts corporate investments and therefore needs an overhaul. This paper argues and shows that although the tax issue jump-

³³ Because the event is rather recent and CRSP has not been updated to this date, I calculate returns from stock prices collected from Yahoo Finance. Market returns are returns on S&P 500 index.

³⁴ Salix Pharmaceuticals cancelled merger with Cosmo Technologies on October 3, 2014, blaming Treasury's new move. Its stock rose by 1.1% that day (S&P 500 also rose by 1.1%). AbbVie announced that its board was weighing the impact of Treasury rules and reconsidering the deal with Shire on October 15, 2014. AbbVie's stock rose by 0.9% (S&P 500 fell by 0.81%).

starts the discussion of foreign cash, the discussion of foreign cash does not necessarily revolve around the tax issue. Firms could hold foreign cash for legitimate operational reasons regardless of the tax consequences, and investors expect them to do so.

Among firms who disclose domestic and foreign cash holdings separately, I examine the valuation of foreign cash holdings. I find that *for a given firm* foreign cash is valued similarly to domestic cash. I do find that the value of additional foreign cash depends on the existing foreign cash level whereas the value of additional domestic cash is independent of the existing domestic cash level, indicating more severe agency problems for foreign operations. Foreign cash is less valuable when the disclosure of foreign operations is lacking and when foreign operations are more complex, but more valuable when the US parent has tighter control over foreign subsidiaries. Highlighting the importance of foreign growth opportunities, firms with faster-growing foreign segments have more valuable foreign cash holdings.

Overall, the results suggest that foreign cash holdings are only a concern when investors have limited control over them. With effective monitoring and disclosure of foreign operations, keeping cash offshore in the presence of high foreign growth opportunities can benefit the US multinational firms.

Chapter 3: Conference presentations and the firm's information environment

3.1. Introduction

Conference presentations, unlike firm-initiated conference calls and press releases, are initiated by a variety of third parties, and have gained increasing popularity in recent years. The current consensus is that conference presentations contain information and help improve investor recognition, and these effects vary with the conference's milieu (Bushee et al., 2011). Relatively few empirical papers have considered different types of conference presentations' effects on the capital market. Most existing studies focus only on conferences hosted by brokerages, presumably because they are the most common. This focus ignores the variation in the information disclosed in different conferences and its implications for a firm's information environment. Furthermore, existing studies conclude that broker-hosted conferences tilt the playing field towards conference participants through close or exclusive access to managers. If the counterfactual to having many broker-hosted conferences, however, is having fewer or no broker-hosted conferences, the information environment may have been even worse. This paper contributes to existing literature by contrasting different conferences and directly examining their impact on analyst forecasts, stock price informativeness, and liquidity.

The most salient feature of this study is that I include three types of conferences classified into categories based on sponsor: broker-hosted conferences, trade shows, and investor relation conferences. I argue that the key differences across these three types of conferences are the relative amount of involvement of analysts versus managers, and the uncertainty of the disclosure. Broker-hosted conferences are held by analysts, and throughout the conference, the hosting analyst and other analysts in the audience can ask presenting firms questions. The dominant presence of

analysts could rein in managers' incentives to be opportunistically biased. Conference materials such as webcasts or transcripts are also most accessible for broker-hosted conferences, reducing processing costs for investors. For conferences held by industry organizations, commonly known as trade shows, the presenting managers take the leading role. Without the facilitation and probing questions from analysts, managers might feel free to oversell their new products and hype investors' expectations for future sales. Unlike broker-hosted conferences, in trade shows managers release a large dose of new product-related fundamental information. If the market has not formed proper expectations about these new products beforehand, trade shows potentially change the true underlying fundamentals the market is betting on by revealing new and uncertain new product lines. I group all of the other conferences hosted by investor relation firms, analyst societies, consulting firms, stock exchanges, etc. together and name them investor relation conferences (IR conferences hereafter). These hosts are closer to the capital market than industry organizations but less so than brokerages. The varying degree of monitoring by analysts and the information uncertainty suggest broker-hosted conferences should have the most positive effect on investors' information precision, and trade shows should have the least positive, or even a negative effect.

Conference presentations also change investors' information distribution by interacting with private information in the market. To what extent public information complements private information depends on how public disclosure stimulates the acquisition of private information or the ability to better process the public disclosure (Kim and Verrecchia, 1991, 1994). More precise public disclosures such as broker-hosted conferences discourage the collection of private information because they create limited trading opportunities to warrant the effort. More uncertain disclosures, such as trade shows, motivate investors to acquire private information or become better information processors. I therefore hypothesize that trade shows (broker-hosted conferences)

act more (less) like a complement to private information, and are associated with higher (lower) information asymmetry.

Using 121,004 conference presentations at 10,367 conferences from 2004 to 2012, I investigate the relationship between three types of conference presentations and three categories of information environment proxies: analyst forecast properties, stock price informativeness, and liquidity. Because most conferences are by invitation, presentations at conferences are not randomly assigned. I include firm fixed effects in all of the regressions and explore within firm variations. I find that analyst forecasts are more accurate and less dispersed in periods when firms present at broker-hosted conferences more frequently, and the improved accuracy is not limited to the hosting analysts. By contrast, the frequency of presentations at trade shows decreases analyst forecast accuracy and increases analyst forecast dispersion.

In the price informativeness analysis, conference presentations at broker-hosted conferences are associated with lower idiosyncratic risk, but trade show presentations are associated with higher idiosyncratic risk. As corroborating evidence, broker-hosted conferences are also associated with higher future earnings response coefficient (FERC), but trade shows are associated with lower FERC.

In the liquidity analysis, broker-hosted conferences are associated with lower price impact and bid-ask spread, as documented by Green et al. (2014a). Trade shows are associated with higher price impact, but are unrelated to the bid-ask spread. These results partially support the hypothesis that trade shows complement informed investors' private information but broker-hosted conferences are a substitute for private information. IR conferences behave like broker-hosted conferences in terms of analyst forecast properties and liquidity, but the effects are not as substantial.

To further explore the difference in disclosure incentives across the three types of conferences, I examine stock returns following conference presentations. In support of managers' optimistically biased disclosure at trade shows, I find price reversal only exists after trade show presentations.

The universally positive effects of broker-hosted conferences highlight the importance of analysts as a crucial information intermediary. The predominantly negative effects of trade shows suggest that such disclosures are not simply signals about fundamentals, because even noisy signals should still help investors update their beliefs rather than harm them. Trade shows signify a change in fundamentals. The price reversal result indicates that managers' disclosure incentives at trade shows are also a culprit. These results echo the findings of Bushee et al. (2013b) who provide evidence that complex language used by analysts in conference calls is informative, but complex language used by managers obfuscates disclosure and increases information asymmetry.

The remainder of this paper is organized as follows. Section 3.2 describes the relevant literature and develops the hypotheses. Section 3.3 outlines the sample selection. Section 3.4 describes the key variables and models. Section 3.5 presents the empirical results. Section 3.6 investigates the stock returns following conference presentations. Section 3.7 concludes.

3.2. Literature review and hypothesis development

3.2.1. Prior literature

Bushee et al. (2011) provide the only existing paper that examines multiple types of conferences. They classify conferences into different categories based on sponsor and location, which they label the "disclosure milieu," because such factors affect participants' interactions with managers. They find that conferences hosted by top brokerage houses and product market sponsors, or held in money centres and destination cities have the largest market reactions. They also find

that conferences hosted by top brokers are associated with larger changes in institutional ownership, and conferences hosted by product market sponsors are associated with smaller changes in analyst following than other conferences. Motivated by Bushee et al.'s findings, this paper acknowledges and incorporates heterogeneity among conferences.

Several other papers examine broker-hosted conferences from different angles. Most of them find that broker-hosted conferences provide selective access to managers for either analysts or investors. Bushee et al. (2013a) find that trade size increases during one-on-one meetings or breakout sessions between investors and managers, and such transactions have significant potential trading gains. Green et al. (2014b) find that the hosting analysts issue more informative recommendations and more accurate analyst forecasts for firms they host, compared with the non-hosting analysts, which suggests that the hosting relationship allows closer access to managers' private information.³⁵ They also find, however, that the hosting analysts' advantage exists even before firms come to their conferences. This indicates that invitations to broker-hosted conferences are more likely the result of an unobservable long-lasting relationship rather than the start of a new relationship. Green et al. (2014a) show that the hosting brokerages' commission revenue increases following their conferences, especially when conference presentations are more informative. They conclude that investors reward brokerages for facilitating disclosures. Markov et al. (2011) find that the price run-up before analysts initiate coverage on a firm with a Buy recommendation is more significant among firms who attend broker-hosted conferences. They interpret that either the initiating analysts or managers leak upcoming analyst initiation to investors in broker-hosted conferences. Subasi (2011) finds institutional investors increase their position in future takeover

³⁵ It is worth noting that forecast accuracy used in Green et al. (2014b) is analyst-level rather than firm-level as examined in this study.

targets when these firms present at broker-hosted conferences, indicating that institutions gain private deal information from presenting managers.³⁶

The closest studies to this paper are Green et al. (2014a) and Subasi and Uzmanoglu (2011). These studies both provide evidence that broker-hosted conference presenters' liquidity increases and cost of capital decreases following the conferences. It is worth noting that one of Subasi and Uzmanoglu's arguments for the decrease in cost of capital is more accurate firm-level analyst forecasts, however, they do not provide any empirical evidence.

3.2.2. Hypothesis development

Firms with better disclosure practice have a lower cost of capital because they have lower information asymmetry and higher liquidity (Diamond and Verrecchia, 1991), or because investors require a lower risk premium for bearing less information risk (Easley and O'Hara, 2004). Prior literature on disclosure generally focuses on firm-initiated disclosures such as conference calls and management forecasts. Conference presentations, however, are not entirely initiated or controlled by firms themselves because conferences are organized by a third-party. This disclosure channel is interesting because the nature of the disclosed information depends on the format of the conferences – a new dimension of voluntary disclosure. This paper examines the frequency of presentations at different types of conferences and conference presentations' effects on firms' information environments. I first investigate the relationship between conference presentations and analyst forecast properties, and then the relationship between conference presentations and stock market outcomes.

³⁶ Empirically Subasi (2011) does not know which institutions actually go to the conferences and which do not, so he can only examine the aggregate institutions' positions. Also, he downplays the fact that firms are invited to the conferences rather than randomly assigned to go. If the factors influencing a brokerage's decision to invite firms are correlated with the characteristics of a potential target, and the institutions bet on possible targets based on the same characteristics, then the brokers' invitations and institutions' bets are results of independent decisions.

3.2.2.1. Major differences across conferences

Conferences differ in two major ways: the relative involvement of analysts and managers, and the nature of disclosed information.

First, conferences sponsored by a specific type of organization have a unique intended audience and entail a certain mixture of participant involvement. Conferences sponsored by brokerages are the most capital-market-oriented and analysts play the most dominant role. Usually, one analyst affiliated with the hosting brokerage house facilitates presentations throughout the conference. Following each firm's presentation, analysts and investors in the audience are free to ask managers questions. Some conferences have one-on-one meetings and breakout sessions where the hosting analyst arranges private meetings between institutional investors and presenting managers. I argue that the active involvement of analysts and other capital market participants in broker-hosted conferences helps curb managers' opportunistic disclosure incentives. Managers have an incentive to push forwards good news and withhold or obfuscate bad news (Kothari et al., 2009; Li, 2008). Prior studies show that non-GAAP earnings disclosure, voluntary disclosure around equity offerings and tone in earnings press releases can be optimistically misleading (Lougee and Marquardt, 2004; Lang and Lundholm, 2000; Huang et al., 2014). Managers also tend to be overconfident, and overconfident CEOs optimistically bias their disclosure (Schrand and Zechman, 2012) and delay loss recognition (Ahmed and Duellman, 2013). Analysts, however, help discipline firms' disclosures (Yu, 2008) and impound bad news into stock prices (Hong et al., 2000).

In contrast to broker-hosted conferences, trade shows do not target the capital market directly and involve information intermediaries the least. Bushee et al. (2011) find a limited

increase in investor recognition after trade shows.³⁷ Without analysts guiding the presentations and asking probing questions, or the pressure to satisfy institutional investors during private meetings, managers' self-serving incentives are less restrained and the disclosure is more likely to be opportunistically biased. IR conferences have a capital market focus that falls somewhere between broker-hosted conferences and trade shows. Firms go to these conferences to increase their visibility and advertise themselves, and some of the conferences are largely social events (e.g. CEO forums organized by universities). They are unlike trade shows where managers promote their new products and take center stage, and also unlike broker-hosted conferences where analysts play a prominent role. Therefore, managers' disclosure incentives are relatively modest during IR conferences.

Because of the capital market focus, broker-hosted conferences are also webcast and transcribed much more frequently than IR conferences and trade shows, and these materials are available to the public either through the presenting firms' websites or third-party financial service companies such as Thomas Reuters. The difference in information gathering efforts from financial service companies is likely because the demand for materials of capital-market-oriented events is higher. In this sense, information disclosed at broker-hosted conferences is the most widespread and requires the least processing costs for investors. Discipline from capital market participants along with low processing costs suggests that broker-hosted conferences offer the highest quality information out of all the conferences. Information quality at trade shows is the lowest, and IR conferences fall somewhere in the middle.

Second, firms disclose different types of information at the three types of conferences. Broker-hosted conferences are relatively frequent and conferences held by different brokerages

³⁷ Trade shows are called "product market conferences" in Bushee et al. (2011).

can be scheduled close together. The presentation, at least the prepared portion, will not change drastically from conference to conference. Indeed, conferences that occur after the firm's own analyst/investor day trigger smaller market reaction, indicating a decrease in new information conveyed by the later conferences (Kirk and Markov, 2014). This does not imply that firms do not need to attend all the broker-hosted conferences, however, because each conference presents a new collection of analysts who may ask different questions.³⁸ By contrast, trade shows happen less frequently and are often more information-laden. Bushee et al. (2011) find that trade shows trigger the biggest market reaction among all the conferences.

More importantly, information uncertainty differs for the three types of conferences. Given that the audience is comprised of analysts, the foremost purpose of broker-hosted conferences is to resolve the uncertainty of earnings, and managers provide financial information to help analysts with their forecasts. In contrast, the information conveyed at trade shows is often new product or new investment related non-financial information, and therefore might create more uncertainty about earnings than it resolves. New products or ideas have an inherently uncertain prospect in terms of sales, and prior studies show that analysts and investors are usually thrown off by non-financial information (Simpson, 2010; Hirshleifer et al., 2012; Rajgopal et al., 2003; Daniel and Titman, 2006). Since IR conferences serve more of a marketing purpose where firms talk broadly about their outlook, they do not resolve as much uncertainty as broker-hosted conferences or create as much uncertainty as trade shows.

3.2.2.2. Hypotheses

Because of the difference in the involvement of capital market participants and the nature of disclosed information, there exists an ordering in the restraint of managerial incentives,

³⁸ Broker-hosted conferences usually do not invite analysts who do not work for the hosting broker.

processing costs and information uncertainty across the conferences. I therefore expect their effects on investors' information precision measured by analyst forecast errors and dispersion to vary accordingly. Prior findings in other settings have shown that when managers are well governed, when analysts are in close contact with managers, and when information is more certain, analysts issue more accurate forecasts (Byard et al., 2006; Chen and Matsumoto, 2006; Zhang, 2006). Lower processing costs are associated with less disagreement (Indjejikian, 1991). Broker-hosted conferences have all of these features, and more presentations at such conferences should be related to more accurate analyst forecasts and lower forecast dispersion. Trade shows are on the opposite end of the spectrum on all fronts, so they should have less positive effects on analyst forecast accuracy and consensus than broker-hosted conferences. I expect IR conferences' effect on analyst forecast accuracy and consensus to fall between broker-hosted conferences and trade shows.

Although less positive than broker-hosted conference presentations, it is unclear whether trade show presentations will hurt analyst forecasts. If managers provide useful product-related information, trade show presentations can still bring investors' expectations closer to the true fundamentals. Non-financial information has long been found to be value-relevant (e.g. Hand, 2005) and indicative of future earnings (e.g. Ittner and Larcker, 1998). Dhaliwal et al. (2012) find that one type of non-financial information, the corporate social responsibility report, is associated with more accurate analyst forecasts. In terms of Bayes rule, having an additional signal (with non-zero precision) should always improve analysts' information precision with respect to true fundamentals.

Even if trade show presentations provide a useful signal, analysts may not be able to use it in their forecasts, given the wealth of other information sources they have. Simpson (2010) shows

that non-financial indicators in wireless industry are correlated with future analyst forecast errors. In a similar vein, Bonacchi et al. (2014) find that their consumer equity metric based on several non-financial indicators for subscription-based enterprises are also correlated with future analyst forecast errors. These findings suggest that analysts do not account (at least entirely) for the implications of non-financial signals.³⁹

Moreover, it is possible that trade show presentations reveal the firm's business is changing so much that earnings uncertainty increases. For example, before the trade show the existing product lines would have a gross profit of \tilde{x} . However, when a new product line is introduced at the trade show, the total gross profit to be forecast now becomes $\tilde{x} + \tilde{y}$. Analysts have to forecast another piece, \tilde{y} , that they have less knowledge about, and this creates more room to make errors and disagree with each other. In this way, trade show presentations are not purely a public signal that updates analysts' belief of underlying fundamentals. Rather, trade shows change the fundamentals themselves. Therefore, trade show presentations can even decrease analyst forecast accuracy and consensus because analysts need to forecast for a more uncertain and complicated firm after the trade show.

In summation, it is intuitive to predict that broker-hosted conferences improve analyst forecast properties given the existing evidence of broker-hosted conferences' positive effect on the hosting analysts' forecasts (Green et al., 2014b). The effects of trade shows, although less positive than broker-hosted conferences, depend on the degree to which they signify the change in

³⁹ These papers examine future analyst forecast errors because the non-financial information they are interested in is disclosed in 10-Ks filed after fiscal year end. To see whether analysts use this information, they can only examine forecasts for the following year. In my setting, conferences happen throughout a year, so I can examine analyst forecasts for the same year.

fundamentals and transform the target that analysts forecast for. To state the first hypothesis formally:

H1: The number of broker-hosted conferences (trade shows) firms present at is most (least) positively related to analyst forecast accuracy and consensus among analysts; the number of IR conferences firms present at has an effect that falls between the other two types of conferences.

Next, I examine the stock market outcomes of conference presentations, specifically, price discovery and liquidity. I use stock returns' idiosyncratic risk and future earnings response coefficient (FERC) to measure stock price informativeness, and use Amihud's (2002) price impact and the bid-ask spread to measure liquidity.

Conferences can affect idiosyncratic risk through information risk (O'Hara, 2003; Easley and O'Hara, 2004) and uncertainty (Pastor and Veronesi, 2003). Easley and O'Hara (2004) use a rational expectations model to show that investors require a higher risk premium if information on the asset is shifted from public to private. They argue that uninformed traders will consistently hold worse portfolios (too many bad news assets and too few good news assets) than informed traders, so they demand compensation for bearing information risk. O'Hara (2003) posits that information risk provides an explanation for why idiosyncratic risk matters for asset pricing, and Easley et al. (2002) find that probability of informed trading (PIN), their proxy for information risk, is a priced factor in stock returns. These results suggest that information risk is one type of idiosyncratic risk, and, consistent with this conjecture, Rajgopal and Venkatachalam (2011) find that poor financial reporting quality is associated with higher idiosyncratic risk. Given the ordering of information quality across the three types of conferences, I expect conference presentations' effect on idiosyncratic risk to vary inversely with their information quality.

The variation in uncertainty created by the conferences also implies different degrees of idiosyncratic risk. Pastor and Veronesi (2003) model investors' learning throughout a firm's lifetime wherein uncertainty of profitability is gradually resolved. They find that idiosyncratic risk increases in uncertainty and empirically find young firms whose uncertainty is high do indeed have higher idiosyncratic volatility. Because broker-hosted conference presentations help the participating analysts achieve more accurate forecasts (Green et al., 2014b) and institutional investors place more profitable trades (Bushee et al., 2013a), it is reasonable to assume that these presentations resolve uncertainty about earnings and should decrease idiosyncratic risk.

As previously discussed, whether trade shows resolve uncertainty or create new uncertainty relies on whether the news at trade shows represents a change in fundamentals. If the market has anticipated the introduction of the new product line and has been forecasting for $\tilde{x} + \tilde{y}$ before the trade show, then the trade show simply serves as a signal for $\tilde{x} + \tilde{y}$ and resolves the uncertainty. If, however, the market has only been forecasting for \tilde{x} , the trade show creates more uncertainty by introducing \tilde{y} . I expect trade shows to either decrease idiosyncratic risk but to a smaller extent than other conferences due to poorer information quality, or increase idiosyncratic risk due to uncertainty about new products.

The literature that examines stock returns' synchronicity with the market (R^2 of market model) argues that the idiosyncratic component of stock returns represents firm-specific news and reflects good information quality (e.g. Hutton et al., 2009). According to this explanation, it appears that broker-hosted conferences should be most positively related to idiosyncratic risk, not most negatively, as predicted above. Roll (1988), however, argues that idiosyncratic risk (or

synchronicity) measures the quality of private information, not the quality of public information such as conference presentations.

With the controversial interpretation of R^2 , or idiosyncratic risk, some papers use another measure of price informativeness, future earnings response coefficient (FERC), to strengthen their findings (e.g. Durnev et al., 2003; Teoh et al., 2008; Ferreira and Laux, 2007). An informed price is more forward-looking and better reflects news about future earnings. Better quality and timelier disclosures are found to be associated with higher FERC (Lundholm and Myers, 2002; Choi et al., 2011). Based on the ordering of information quality across the conferences, broker-hosted conferences should be most positively associated with FERC. Trade shows may be either positively or negatively associated with FERC, but the relation should be less positive than broker-hosted and IR conferences. To state the second hypothesis formally:

H2: The number of broker-hosted conferences (trade shows) firms present at is most (least) negatively correlated with idiosyncratic risk and most (least) positively correlated with FERC; the effect of the number of IR conferences on idiosyncratic risk and EFRC is between broker-hosted conferences and trade shows.

Conferences also differ in the way they distribute information among investors. I now turn to how conferences affect information asymmetry among investors as it manifests itself through liquidity. When information distribution among traders becomes more uneven, uninformed traders will price protect themselves by widening the bid-ask spread, and each trade will have a bigger price impact (Kyle, 1985). The relationship between public disclosures and information asymmetry depends on how public disclosures interact with private information in the market. Most empirical findings dictate that public information takes away some of the informational advantage from informed investors and brings uninformed investors to a more even playing field

(e.g. Healy et al., 1999; Leuz and Verrecchia, 2000). Less information asymmetry increases liquidity, which in return decreases the cost of capital (Diamond and Verrecchia, 1991). In some situations, however, public information benefits informed traders more than uninformed traders such that the former's informational advantage over the latter is further widened by public information. In this case, public information acts as a complement to private information rather than a substitute for private information (Lundholm, 1988), and information asymmetry (liquidity) will increase (decrease) following public disclosure. Empirically, the bid-ask spread widens during earnings announcements (Krinsky and Lee, 1996) and the increase in information asymmetry persists for some firms (Gow et al., 2012). Blankspoor et al. (2014) find firms' liquidity deteriorates after the adoption of XBRL format.

The degree to which a public disclosure complements private information depends on how the public disclosure motivates investors to acquire private information beforehand (Kim and Verrecchia, 1991), or how able investors are at interpreting the public disclosure into their own private information (Kim and Verrecchia, 1994).

In anticipation of a scheduled conference, investors expect the public disclosure to create trading opportunities, so they collect private information before the public disclosure in the hope of benefiting from trading (Kim and Verrecchia, 1991). Acquisition of private information by some investors creates information asymmetry. When public information gets rather precise, investors do not have incentives to acquire private information because upon the public disclosure, everyone's belief will converge and there will be limited room for disagreement and trading opportunities.⁴⁰ Broker-hosted conferences provide high-quality public information that helps

⁴⁰ Extremely imprecise public information does not motivate acquisition of private information either, because the disclosure will not stir the market enough to create disagreement and investors therefore do not bother to collect private information before the

enhance consensus among investors, and therefore should not motivate much acquisition of private information before the conferences. Trade shows disclose information of relatively lower quality and leave open the possibility of more disagreement, so they should encourage more acquisition of private information and cause more information asymmetry.⁴¹

Alternatively, Kim and Verrecchia (1994) suggest that investors may vary in terms of their ability to interpret the public disclosure. That is, some investors are capable of processing the public disclosure into private information and gain an informational advantage over other investors. The incentive to better process public information is stronger when public information is less reliable and uncertain (Lin et al., 2014). When public disclosure is more precise, as in broker-hosted conferences, investors are discouraged from becoming better information processors and information asymmetry is lower. Trade shows represent less precise public disclosures and information-laden events that may create a high level of earnings uncertainty. These features are more likely to motivate investors to become information processors and increase information asymmetry.

When public disclosure is less precise, it complements private information more and creates higher information asymmetry. Therefore, trade shows (broker-hosted conferences) act more (less) like a complement to private information. Or, stated differently, trade shows (broker-hosted conferences) act less (more) like a substitute for private information. Green et al.'s (2014a)

public disclosure. That is, the relationship between private information acquisition and the precision of public information is an inverse-U shape.

⁴¹ Although private information acquisition first increases in the precision of public information and then decreases in the precision of public information (inverse-U), Green et al. (2014a) find that information asymmetry decreases after broker-hosted conferences (i.e. the public disclosure is a substitute for rather than complement to existing private information), suggesting broker-hosted conference presentations are rather precise and probably lie in the downward-sloping portion of the inverse-U. Therefore, other conferences with less precise information are likely to incur more private information acquisition and information asymmetry.

finding that information asymmetry decreases after broker-hosted conferences suggests that they serve as a substitute for private information.⁴²

Empirically, Spiegel and Wang (2005) demonstrate that idiosyncratic risk is positively related to illiquidity. This finding is intuitive since most anomalies are concentrated in high idiosyncratic risk stocks because arbitrageurs shy away from them due to their large price impact (Hong et al., 2000; Hou et al., 2005; Mashruwala et al., 2006). The prediction regarding conference presentations' effect on illiquidity should echo the prediction with respect to idiosyncratic risk. To state the last hypothesis formally:

H3: The number of broker-hosted conferences (trade shows) firms present at is most (least) negatively related to illiquidity; the effect of IR conferences is between broker-hosted conferences and trade shows.

3.3. Sample selection

Conference presentations from 2004 to 2012 are retrieved from the Bloomberg Corporate Events Database. The conference name, date, presenting firms' name and stock ticker are provided by the database. I manually code sponsors based on conference names and classify conferences into the three types.⁴³ There are 121,004 conference presentations at 10,367 conferences during the sample period. I match firms in CRSP/Compustat merged database with conference presentation data using both ticker and company name. Analyst data is from I/B/E/S, and for broker-hosted conferences I merge the brokerage name with the brokerage code in I/B/E/S to

⁴² This paper focuses on how frequency of presentations affects liquidity, and more importantly, this paper is able to compare the effects of presentations at different conferences in the same model.

⁴³ Bushee et al. (2011) classify conferences into two large categories: product market sponsors and capital market sponsors. Product market sponsors include trade associations, consulting firms, media organizations, individual companies, and universities. Capital market sponsors include top brokerage houses, other brokerage houses, analyst societies, investor relation firms and stock exchanges. I essentially regroup the sponsors into three types: brokerage houses (top + other), trade associations and all the others. Having three groups of conferences provides a balance between variation across categories and sufficient observations in each category.

identify which analysts are affiliated with the hosts. I use the Thomson One database to identify whether a conference presentation has a transcript. Management forecast and earnings call data is collected from Capital IQ. Institutional ownership data is from Thomson Reuters Institutional Holdings (13f) database. The sample for analyst forecast properties includes 27,409 firm-years. The idiosyncratic risk and liquidity analysis includes 25,090 firm-years. The FERC analysis has 25,422 firm-years. The sample sizes differ due to the availability of test and control variables.

3.4. Key variables and models

3.4.1. Number of conferences

The test variable is the number of conferences the firm presents at each year. $Confs - Broker_{i,t}$ is the number of broker-hosted conferences firm i attends during year t . I further break this variable into $Confs - Broker - Tran_{i,t}$ and $Confs - Broker - NoTran_{i,t}$, representing the number of broker-hosted conferences with transcripts and without transcripts respectively. The number of trade shows is $Confs - Trade_{i,t}$, and the number of IR conferences is $Confs - IR_{i,t}$. The time periods over which I count the number of conferences are slightly different across tests. In the analyst forecast properties test, the time period is between the annual earnings announcement date of year $t-1$ and earnings announcement date of year t . In the idiosyncratic risk and liquidity tests, the time period is fiscal year t . In the FERC test, the time period is 3 months after fiscal year end of year $t-1$ through 3 months after fiscal year end of year t . Results are very similar if the time period is defined as fiscal year t for every test.

3.4.2. Analyst forecast properties analysis

Define the average absolute analyst forecast errors, $Errors_{i,t}$, as:

$$Errors_{i,t} = \frac{1}{N} \sum_{j=1}^N |Forecast_{i,t,j} - EPS_{i,t}| / P_{i,t} \quad (1)$$

Where $Forecast_{i,t,j}$ is the last forecast by analyst j before earnings of year t is announced, and N is the number of analysts covering firm i in year t. I use the latest forecast before earnings announcement because I count the number of conferences between two earnings announcement dates and I want to give analysts enough chance to update their forecasts. Both $Forecast_{i,t,j}$ and $EPS_{i,t,j}$ are collected from I/B/E/S and adjusted for stock splits. The average absolute analyst forecast errors are scaled by stock price at the end of fiscal year t. Dispersion of analyst forecasts is the standard deviation of $Forecast_{i,t,j}$ scaled by stock price:

$$Dispersion_{i,t} = \sqrt{\text{Var}(Forecast_{i,t,j})} / P_{i,t} \quad (2)$$

$$\text{Where } \text{Var}(Forecast_{i,t,j}) = \sum_{j=1}^N (Forecast_{i,t,j} - \overline{Forecast_{i,t}})^2 / N - 1.$$

To support my assertion that conference presentations are mainly a public disclosure medium that benefits not only the hosting analysts, but also other analysts as long as conference materials are easily accessible, I also calculate $Errors_{i,t}$ for analysts unaffiliated with the hosts. I first gather all of the broker-hosted conferences firm i attends during year t, and then exclude all of the analysts working for the hosting brokerages when calculating $Errors_{i,t}$ in (1). I label this variable $Errors - No Host_{i,t}$.

I follow previous studies to control for other variables that are related to analyst forecast properties (e.g. Lang and Lundholm, 1996; Lehavy et al., 2011; De Franco et al., 2011), including size (*Size*), analyst following (*Analyst*), earnings loss (*Loss*), institutional ownership (*Institution*), growth opportunities (*Growth*), R&D (*R&D*), and variability of earnings and returns (*Ret Volatility* and *Earn Volatility*). Detailed variable definitions are described in the Appendix. It is worth noting that most conferences are invitation-only. If some omitted firm characteristics correlated with analyst forecast properties or other outcome variables and these characteristics also affect the invitation decision of the sponsors or the participation decision of the firms, then the frequency of conference presentations could pick up the effect of these characteristics.⁴⁴ To alleviate this endogeneity concern, I include firm fixed effects in all regressions in this paper, so as to explore within firm variation across time. I also include year fixed effects. The model for analyst forecast properties is as follows:

$$\text{Errors}_{it} \text{ or Dispersion}_{it} = \alpha + \beta_1 \text{Confs-Broker}_{it} + \beta_2 \text{Confs-Trade}_{it} + \beta_3 \text{Confs-IR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Analyst}_{it} + \beta_6 \text{Institution}_{it} + \beta_7 \text{Loss}_{it} + \beta_8 \text{Growth}_{it} + \beta_9 \text{R\&D}_{it} + \beta_{10} \text{Ret Volatility}_{it} + \beta_{11} \text{Earn Volatility}_{it} + \text{Firm FEs} + \text{Year FEs} + \varepsilon_{it} \quad (3)$$

Among the three coefficients of conference presentations, β_1 (β_2) is expected to be the most (least) negative, and β_3 lies in the middle. When the dependent variable excludes analysts affiliated with the hosts, the model is as follows:

$$\text{Errors-No Host}_{it} = \alpha + \beta_1 \text{Confs-Broker-Trans}_{it} + \beta_2 \text{Confs-Broker-No Trans}_{it} + \beta_3 \text{Confs-Trade}_{it} + \beta_4 \text{Confs-IR}_{it} + \beta_5 \text{Size}_{it} + \beta_6 \text{Analyst}_{it} + \beta_7 \text{Institution}_{it} + \beta_8 \text{Loss}_{it} + \beta_9 \text{Growth}_{it} + \beta_{10} \text{R\&D}_{it} + \beta_{11} \text{Ret Volatility}_{it} + \beta_{12} \text{Earn Volatility}_{it} + \text{Firm FEs} + \text{Year FEs} + \varepsilon_{it} \quad (4)$$

⁴⁴ Indeed, Green et al. (2014a) show that the number of brokerage houses inviting a firm is related to the firm's institutional ownership and intangible assets.

I predict β_1 (β_3) to be the most (least) negative, and β_4 to be in the middle. I do not have a prediction for β_2 .

3.4.3. Idiosyncratic risk analysis

Following Rajgopal and Venkatachalam (2011), I use the Fama-French three-factor model to calculate idiosyncratic volatility. In each month, I estimate the model using daily returns, and the variance of residuals times the number of trading days is the monthly variance of excess returns. For each year, idiosyncratic risk is the average of the 12 monthly variances of excess returns.

In the R^2 literature, studies usually use the inverse synchronicity measure, which is some transformation of R^2 from the market model (e.g. $\ln((1-R^2)/R^2)$). Inverse synchronicity and idiosyncratic risk are similar constructs, but Li et al. (2013) show that the two measures are not econometrically equivalent. Specifically, $\ln((1-R^2)/R^2)$ can be rewritten as $\ln(\sigma_e^2/\beta^2*\sigma_{rm}^2)$, where σ_e^2 is the variance of residuals from the market model (idiosyncratic risk), and σ_{rm}^2 is the variance of expected returns. In other words, inverse synchronicity is essentially idiosyncratic risk scaled by systematic risk, and Li et al. (2013) provide evidence that the scaling can partially explain the prior conflicting conclusions using the two constructs. I use both idiosyncratic risk and inverse synchronicity to be comprehensive. Inverse synchronicity is measured as $\ln((1-R^2)/R^2)$ following prior studies, where R^2 is the average monthly R^2 s from the Fama-French three-factor model.

Following Rajgopal and Venkatachalam (2011), I also include control variables that capture firms' fundamentals, investor sophistication, and information dissemination practice other than conference presentations. These are size (*Size*), leverage (*Lev*) and book-to-market ratio (*BM*), cash flows (*CFO*) of prior year and one year ahead, volatility of cash flow (*VCFO*), analyst following (*Analyst*), institutional ownership (*Institution*), squared stock returns (Ret^2), squared

analyst forecast revisions ($Frev^2$) as a proxy for other channels of information, contemporaneous stock performance (Ret), and earnings quality measure based on Dechow and Dichev (2002), DD .

The model is as follows:

$$\begin{aligned} Irisk_{it} \text{ or } Invsynch_{it} = & \alpha + \beta_1 \text{Cons-Broker}_{it} + \beta_2 \text{Cons-Trade}_{it} + \beta_3 \text{Cons-IR}_{it} + \beta_4 DD_{it-1} + \\ & \beta_5 BM_{it-1} + \beta_6 \text{Size}_{it-1} + \beta_7 \text{Lev}_{it-1} + \beta_8 \text{CFO}_{it-1} + \beta_9 \text{CFO}_{it+1} + \\ & \beta_{10} \text{VCFO}_{it-1} + \beta_{11} \text{Analyst}_{it-1} + \beta_{12} \text{Institution}_{it-1} + \beta_{13} \text{Ret}_{t-1}^2 + \\ & \beta_{14} \text{Ret}_t + \beta_{15} \text{Frev}_{t-1}^2 + \text{Firm FEs} + \text{Year FEs} + \varepsilon_{it} \end{aligned} \quad (5)$$

I predict the ordering among β_1 , β_2 and β_3 to be $\beta_1 < \beta_3 < \beta_2$.

3.4.4. Future earnings response coefficient (FERC) analysis

I use FERC as the second measure of price informativeness, and the basic idea behind FERC is as follows:

$$r_t = a + b_0 \Delta E_t + \sum_{\tau} b_{\tau} \Delta E_{t+\tau} + \sum_{\tau} c_{\tau} r_{t+\tau} + u_t \quad (6)$$

Current returns r_t reflect contemporaneous earnings surprise, ΔE_t , and the change in expectations of future earnings. Change in realized future earnings $\Delta E_{t+\tau}$ is used as a proxy for change in expectations of future earnings, and future returns $r_{t+\tau}$ are included to correct the measurement errors in model (6) (Lundholm and Myers, 2002). The coefficient b_0 is earnings response coefficient (ERC), and $\sum_{\tau} b_{\tau}$ is usually labelled future earnings response coefficient (FERC).

Although both ERC and FERC capture the earnings-returns relationship, FERC highlights how forward-looking the firm's disclosure practice is, and is often used to measure price informativeness. Expanding ΔE_t and $\Delta E_{t+\tau}$ into earnings of prior year, current year, and future years in (6), I add interactions between future earnings $E_{t+\tau}$ and the frequency of conference

presentations to examine whether the relationship between current returns r_t and future earnings $E_{t+\tau}$ is strengthened or weakened by the conferences.

In order to argue that conference presentations improve price informativeness above and beyond firms' other disclosure channels, I include two indicator variables: whether firms hold earnings conference calls (*call*) and whether managers make forecasts (*MForecast*).⁴⁵ Kimbrough (2005) finds that conference calls result in more timely analyst and investor reactions to the future implications of currently reported earnings. Choi et al. (2011) show that firms issuing management forecasts have higher FERC. The interactions between the two indicator variables and prior, current, future earnings, and future returns are also in the model. The specific model is as follows:

$$\begin{aligned}
 \text{Ret}_{it} = & \alpha + \beta_1 \text{Earn}_{it-1} + \beta_2 \text{Earn}_{it} + \beta_3 \text{Earn}_{it+1,t+3} + \beta_4 \text{Ret}_{it+1,t+3} + \beta_5 \text{Confs-Broker}_{it} + \\
 & \beta_6 \text{Confs-Broker}_{it} \times \text{Earn}_{it-1} + \beta_7 \text{Confs-Broker}_{it} \times \text{Earn}_{it} + \\
 & \beta_8 \text{Confs-Broker}_{it} \times \text{Earn}_{it+1,t+3} + \beta_9 \text{Confs-Broker}_{it} \times \text{Ret}_{it+1,t+3} + \beta_{10} \text{Confs-Trade}_{it} + \\
 & \beta_{11} \text{Confs-Trade}_{it} \times \text{Earn}_{it-1} + \beta_{12} \text{Confs-Trade}_{it} \times \text{Earn}_{it} + \beta_{13} \text{Confs-Trade}_{it} \times \text{Earn}_{it+1,t+3} + \\
 & \beta_{14} \text{Confs-Trade}_{it} \times \text{Ret}_{it+1,t+3} + \beta_{15} \text{Confs-IR}_{it} + \beta_{16} \text{Confs-IR}_{it} \times \text{Earn}_{it-1} + \\
 & \beta_{17} \text{Confs-IR}_{it} \times \text{Earn}_{it} + \beta_{18} \text{Confs-IR}_{it} \times \text{Earn}_{it+1,t+3} + \beta_{19} \text{Confs-IR}_{it} \times \text{Ret}_{it+1,t+3} + \\
 & \beta_{20} \text{Call}_{it} + \beta_{21} \text{Call}_{it} \times \text{Earn}_{it-1} + \beta_{22} \text{Call}_{it} \times \text{Earn}_{it} + \beta_{23} \text{Call}_{it} \times \text{Earn}_{it+1,t+3} + \\
 & \beta_{24} \text{Call}_{it} \times \text{Ret}_{it+1,t+3} + \beta_{25} \text{MForecast}_{it} + \beta_{26} \text{MForecast}_{it} \times \text{Earn}_{it-1} + \\
 & \beta_{27} \text{MForecast}_{it} \times \text{Earn}_{it} + \beta_{28} \text{MForecast}_{it} \times \text{Earn}_{it+1,t+3} + \beta_{29} \text{MForecast}_{it} \times \text{Ret}_{it+1,t+3} + \\
 & \text{Firm FEs} + \text{Year FEs} + \varepsilon_{it}
 \end{aligned} \tag{8}$$

For future earnings, I sum up earnings from t+1 through t+3 following Lundholm and Myers (2002) because the model is already quite large and adding future earnings year by year will make it much larger. I predict β_8 (β_{13}) to be the most (least) positive, and β_{18} to be in the middle.

Because larger, well-followed firms have higher FERC and those firms also present at more conferences, the frequency of conference presentations could reflect a size effect. I therefore also

⁴⁵ AIMR rating scores are not available for my sample period.

estimate the specification including size and analyst following, plus their interactions with earnings and stock returns.

3.4.5. Liquidity analysis

I use the price impact measure introduced by Amihud (2002) and the bid-ask spread to measure illiquidity because these two proxies are available for a large sample of firms.⁴⁶ Amihud's measure, Illiq, is as follows:

$$\text{Illiq}_{it} = \frac{1}{N_{it}} \sum_{d=1}^{N_{it}} \frac{|R_{id}|}{\text{Vol}_{id}} \quad (9)$$

Where N_{it} is the number of trading days for firm i during year t ; $|R_{id}|$ is the absolute stock return for firm i in year t on date d , i.e. the absolute percentage price change; Vol_{id} is the dollar trading volume for firm i in year t on date d . This variable measures the average daily price impact given one dollar trading volume.

Daily bid-ask spread is measured following Lang et al. (2012):

$$\text{Bidask}_{id} = \log \left(\frac{\text{Ask}_{id} - \text{Bid}_{id}}{(\text{Ask}_{id} + \text{Bid}_{id}) / 2} \right) \quad (10)$$

Bid-ask spread for firm i in year t , Bidask_{it} , is the median of all the Bidask_{id} in year t .⁴⁷

The dependent variable in illiquidity analysis is either Illiq_{it} or Bidask_{it} , and I use control variables from the idiosyncratic risk analysis above. The model is as follows:

⁴⁶ I also use PIN as the dependent variable in a reduced sample, and the results are similar to using the bid-ask spread as the dependent variable.

⁴⁷ Using mean of daily bid-ask spread in year t generates similar results.

$$\begin{aligned}
\text{Illiq}_{it} \text{ or Bidask}_{it} = & \alpha + \beta_1 \text{Cons-Broker}_{it} + \beta_2 \text{Cons-Trade}_{it} + \beta_3 \text{Cons-IR}_{it} + \beta_4 \text{DD}_{it-1} + \\
& \beta_5 \text{BM}_{it-1} + \beta_6 \text{Size}_{it-1} + \beta_7 \text{Lev}_{it-1} + \beta_8 \text{CFO}_{it-1} + \beta_9 \text{CFO}_{it+1} + \\
& \beta_{10} \text{VCFO}_{it-1} + \beta_{11} \text{Analyst}_{it-1} + \beta_{12} \text{Institution}_{it-1} + \beta_{13} \text{Ret}_{t-1}^2 + \\
& \beta_{14} \text{Ret}_t + \beta_{15} \text{Frev}_{t-1}^2 + \text{Firm FEs} + \text{Year FEs} + \varepsilon_{it}
\end{aligned} \tag{11}$$

3.5. Results

This section reports the empirical results of the association between different types of conference presentations and analyst forecast properties, price informativeness, and liquidity. Descriptive statistics of the variables used in the three tests are reported in Table 3.1, and all of the continuous variables are winsorized at 1% and 99%. Average analyst forecast errors are less than 2% of stock price, and analysts affiliated with the hosting brokerages are no more accurate than unaffiliated analysts.⁴⁸

Broker-hosted conferences are the most common type of conference. Firms on average attend three broker-hosted conferences a year, one with a transcript and two without. They average one trade show every four years and one IR conference every other year. Idiosyncratic risk is comparable to Li et al. (2013), although inverse synchronicity with the market is somewhat smaller. Illiquidity is larger than other studies because the sample selection requirement is modest and many small firms are included. For example, the median of illiquidity is 0.009 here, but is 0.002 for conference call holders in Bushee et al. (2013). The distribution of illiquidity is also skewed even after winsorizing at 1% and 99%. Regression results stay the same if I winsorize this variable at 5% and 95%.⁴⁹ The average bid-ask spread is 0.003. Slightly more than 40% of the firms hold earnings conference calls, and 30% of the firms issue management forecasts.

⁴⁸ The forecast errors are smaller than other studies, for example, De Franco et al.'s (2011) 5% and Hefflin et al.'s (2003) 3%, because I use each analyst's latest forecast before earnings announcement rather than the consensus calculated by I/B/E/S. The mean and median of analyst forecast dispersion is close in magnitude to Lang and Lundholm (1996).

⁴⁹ Using the logarithm transformation of illiquidity yields qualitatively similar results.

Table 3.2 presents the results for analyst forecast properties. The dependent variable is absolute forecast errors in the first two columns, and dispersion in the last column. As seen in column 1, *Confs-Broker* is significantly negatively related to forecast errors, consistent with the hypothesis that analysts make more accurate forecasts when firms present at broker-hosted conferences frequently. One standard deviation increase in the *Confs-Broker* is associated with 0.11% decrease in forecast errors, a relatively sizable effect considering the unconditional mean of forecast errors being 1.9%.⁵⁰ *Confs-Trade* is positively correlated with absolute forecast errors, indicating analysts are less accurate when firms present more often at trade shows. One standard deviation increase in *Confs-Trade* is associated with 0.07% increase in forecast errors. This result suggests that trade show presentations are not simply a signal for existing fundamentals, but represent change in fundamentals themselves. Analysts have trouble forecasting new pieces of fundamentals that they do not expect before the trade shows. *Confs-IR* is significantly negative, indicating IR conferences behave more similarly to broker-hosted conferences. The coefficient of *Confs-IR* is smaller than *Confs-Broker* as predicted, but they are not statistically different.

In column 2, after excluding analysts associated with the hosting brokerages and breaking down *Confs-Broker* into *Confs-Broker-Trans* and *Confs-Broker-No Trans*, I find that *Confs-Broker-Trans* is negatively correlated with *Errors-No Host* but *Confs-Broker-No Trans* is insignificant. This result suggests that conference presentations do not benefit analysts who are physically in the conferences exclusively, but also benefit uninvited analysts as long as the conference materials are easily available. *Confs-Trade* remains significantly negative. In column 3, *Confs-Broker* significantly reduces analyst forecast dispersion, although the economic

⁵⁰ The effect associated with one more conference is small, though. Presenting at one more broker-hosted conference decreases forecast errors by only 0.03% of stock price.

magnitude is small. *Confs-IR* is also significantly negative at the 10% level, and the coefficient of *Confs-Trade* is once again significantly positive, indicating analysts disagree more when new product disclosure with high uncertainty arises, corroborating the result of forecast accuracy. Most control variables have the expected signs: loss and growth are positively related to forecast errors and dispersion, and size is negatively related to both. The only surprising exception is analyst following, which decreases accuracy. Taken together, the results indicate that broker-hosted conferences, especially the ones transcribed, improve the accuracy and consensus of analysts, but trade shows hurt both. Broker-hosted conference presentations serve as a high quality signal for existing fundamentals, but trade show presentations change the fundamentals analysts forecast for and thereby make their jobs harder. IR conferences are closer to broker-hosted conferences in terms of their effect on analysts, but the effect is not as significant.

Table 3.3 provides the results of the first price informativeness measure. The dependent variable is idiosyncratic risk in column 1 and inverse synchronicity in column 2. Although Li et al. (2013) demonstrate that they are not always interchangeable, in my sample they behave consistently. The three conference variables and most control variables have the same sign for both measures. Specifically, *Confs-Broker* is negatively associated with idiosyncratic risk and inverse synchronicity, *Confs-Trade* is positively associated with both, and *Confs-IR* is unrelated with either measure. Once again, *Confs-Broker* and *Confs-Trade* have opposite relations with the dependent variables. Given the previous result that *Confs-Broker* helps improve analyst forecast accuracy and consensus, it is reasonable to expect its impact on price informativeness to be positive. Similarly, since *Confs-Trade* harms analyst forecast accuracy and consensus, it is not surprising that its effect on price informativeness is also negative. The result of trade shows is consistent with Pastor and Veronesi's model that uncertainty about profitability increases idiosyncratic risk. Taken

together, Table 3.3 shows that inverse synchronicity does not capture disclosure quality because the conferences that help analyst forecasts decrease the measure, and the conferences that harm analyst forecasts increase the measure. The results also support Chan and Chan (2014) who find price is more informative when stock return synchronicity is high.

Table 3.4 presents the results for the second price informativeness measure, FERC. As a benchmark, the first column does not include indicators for earnings conference calls and management forecasts. In column 1, the interaction between *Confs-Broker* and $Earn_{t+1,t+3}$ is significantly positive. Consistent with prior results, current stock returns reflect more future earnings news when firms present at more broker-hosted conferences. Interestingly, $Confs-Broker \times Earn_t$ is significantly negative, indicating current earnings news is substituted by future earnings news in current stock returns (Lundholm and Myers, 2002). This further confirms lower idiosyncratic risk and inverse synchronicity represent reduced noise rather than a lack of firm-specific information. The interaction between *Confs-Trade* and $Earn_{t+1,t+3}$ is negative albeit insignificant. The second column includes other disclosure channels, earnings conference calls, and management forecasts. The results with respect to the interactions of *Confs-Broker* and current/future earnings remain unchanged, and $Confs-Trade \times Earn_{t+1,t+3}$ is now significantly negative at 5% level. This result reinforces what has been found about trade shows so far: they decrease analyst forecast accuracy, increase analyst forecast dispersion, increase idiosyncratic risk, and they also make stock price incorporate less future earnings news. IR conferences do not affect the relationship between current returns and future earnings, although there is some evidence in column 2 that they are associated with higher ERC. To rule out the possibility that a size effect drives the results, I control for size and analyst following in column 3. Although the magnitude decreases slightly, coefficients of $Confs-Broker \times Earn_{t+1,t+3}$ and $Confs-Trade \times Earn_{t+1,t+3}$ are

significantly positive and negative at 10% level. Both earnings calls and management forecasts are associated with higher FERC. This set of results is reassuring because the conclusions here are exactly the same as idiosyncratic risk or inverse synchronicity.

The results of illiquidity are reported in Table 3.5. The dependent variable is *Illiq* in column 1, and *Bidask* in column 2. The pattern of the coefficients in column 1 resonates with the results of analyst forecast properties: *Confs-Broker* is the most negative, *Confs-IR* is also negative but less so, and *Confs-Trade* is positive. This result indicates that broker-hosted conferences are a substitute for private information. More conferences of this type even the information distribution in the market and reduce information asymmetry. Trade shows, however, are information-laden events that either stimulate the acquisition of private information or motivate investors to become better information processors. Consequently, trade shows complement private information and more conferences of this type increase information asymmetry. In some sense, broker-hosted conferences behave similarly to other voluntary disclosure channels (e.g., management forecasts) but trade shows behave similarly to earnings announcements. The coefficient of *Confs-Broker* indicates that presenting at one more broker-hosted conference is associated with a 0.0478 decrease in *Illiq*. This is not a small effect because the Q1 to Q3 spread in *Illiq* is 0.146. Presenting at one more trade show is associated with 0.1561 increase in *Illiq*. In column 2, *Confs-Broker* is also significantly negative, consistent with Green et al. (2014a). One more broker-hosted conference is associated with a 0.0042 decrease in log of the bid-ask spread – a rather small effect given the Q1 to Q3 spread of 2.11. Neither *Confs-Trade* nor *Confs-IR* is significantly related to the bid-ask spread.

In summation, broker-hosted conferences have a positive effect on all of the information environment proxies across the board. By contrast, trade shows have a negative effect on all of the

proxies except the bid-ask spread. IR conferences are closer to broker-hosted conferences in some aspects, but the effects are generally milder. These results suggest that how conference presentations affect the information environment largely depends on the structure of the conferences and the nature of the information disclosed.

3.6. Conference presentations and stock price reversal

The results above are reminiscent of the findings of Savor (2012) who uses analysts' report issuance to categorize large price change events into information-based events and no-information events. He finds that information-based events (i.e. price changes accompanied by analyst reports) correlate more with future earnings than no-information events (i.e. price changes not accompanied by analyst reports), and at an aggregate level the ratio of no-information events to information-based events is correlated with volatility. Assume analysts hosting a conference and analysts issuing a report are comparable activities (Green et al, 2014a), empirically it seems that broker-hosted conferences behave like information-based events, and trade shows that do not involve analysts much behave like no-information events. Savor's (2012) main conclusion is that investors overreact to no-information events but underreact to information-based events, as evidenced by price reversal following no-information events and price drift following information-based events. Although he does not pinpoint the exact reason for this phenomenon, in my setting I posit that managers' opportunistic disclosure incentives are most (least) restrained in broker-hosted conferences (trade shows). Biased disclosure should be followed by price reversal as investors initially overreact to the unduly optimistic disclosure by managers (Huang et al., 2014). Therefore, I expect trade show presentations to trigger more price reversal. Following Savor (2012), I examine stock returns immediately after conference presentations with the model:

$$AR_{i,t} = \alpha + \beta_1 AR_0 + \beta_2 Size + \beta_3 BM + \beta_4 MOM + \beta_5 Volumn + \varepsilon \quad (12)$$

The test variable, AR_0 is the abnormal returns on the conference presentation date. The dependent variable, $AR_{1,t}$ is the accumulative abnormal returns following conference presentations over the window $[1,t]$, t being 5 or 10.⁵¹ Abnormal returns are the excess returns from the Carhart (1997) 4-factor model. The model is estimated using 255 trading days ending on day -31, with at least 30 observations. Several variables affecting stock returns are controlled for, including size, book-to-market ratio, momentum, and trading volume. Size and book-to-market ratio are measured one trading day before the conference presentation date, momentum is the buy-and-hold stock returns in the previous 12 months, and trading volume is traded shares as a percentage of outstanding shares on the conference presentation date. Some conference presentation dates coincide with earnings announcements. Since earnings announcements are known to generate drift and they are also much more significant events than conference presentations, I exclude these dates. Detailed variable definitions are described in the Appendix. A significant negative β_1 will indicate reversal as investors correct their beliefs in the days following the events. A positive β_1 will suggest initial underreaction. I run model (9) for each type of conference separately, and I also stack the three types of conference together by creating an indicator variable *Trade* and interacting it with AR_0 .

Descriptive statistics for the tests are shown in Panel A of Table 3.6. Panel B shows the regression results of model (12) for the three types of conferences in the first 6 columns, and in the last two columns all conferences are stacked together. For broker-hosted conferences, the coefficient of AR_0 is insignificantly negative for window $[1,5]$ and insignificantly positive for window $[1,10]$. For IR conferences, the coefficient of AR_0 for both windows is insignificantly

⁵¹ Savor (2012) examines four windows, $[1,5]$, $[1,10]$, $[1,20]$ and $[1,40]$. I only keep the two shorter windows because the price impact of conference presentations is usually not as big as 10%, as in Savor (2012), so presumably the price drift or reversal takes less time. Another reason for using shorter windows is that some firms go to conferences rather frequently, and the longer window might cover the market reaction to the next event. In untabulated results, I examine the two longer windows and find no results for any type of conferences.

negative. The coefficients of AR_0 are significantly negative for both windows for trade shows. In the last two columns, the interactions between *Trade* and AR_0 are also negative. Therefore, investors tend to overreact to trade show presentations where analysts are less involved and managers are free to tout their new products.

A caveat to these results is that conference presentations are not large price change events. On average, the market reaction on the conference presentation date is mild, only 0.1%, as shown in Table 3.6 Panel A. AR_0 at broker-hosted conferences is not significantly different from trade shows, but significantly higher than IR conferences (results untabulated). Although the regressions suggest price reversal following trade shows, it is important to note that the initial market reaction is small to begin with.

3.7. Conclusion

This paper studies how conference presentations of different types affect firms' information environments. When firms present more often at broker-hosted conferences, analyst forecasts are more accurate and less dispersed, stock idiosyncratic risk is lower, FERC is higher, the price impact is lower and the bid-ask spread is lower. By contrast, the frequency of trade show presentations has the opposite effect on all of these aspects except the bid-ask spread. Presentations at conferences held by neither brokers nor trade organizations behave similarly to broker-hosted conferences in some of the tests, but the effects are not as strong. Further investigation into trade shows reveals that investors tend to overreact to firms' presentations at trade shows.

These results indicate that broker-hosted conference presentations are high quality disclosure that improves both information precision and information distribution in the market. The findings that trade show presentations not only have a less positive effect on the information environment than broker-hosted conference presentations but actually have a negative effect

suggest that trade shows are not simply another signal for the existing fundamentals. Trade shows reveal new products or new investments that change the fundamental truth that the market is betting on.

Chapter 4: Conclusion

Disclosures by firms can affect investors either through investors' use of disclosures to monitor firms' decision-making, or through direct capital market consequences. This dissertation examines two types of new disclosures and studies the stewardship role and the valuation role respectively. Although the disclosure requirement in the US is already rather stringent- to a point that some commentators argue that it imposes excessive costs on firms listed in the US- the regulators still constantly demand new information from firms. These new disclosures afford investors the opportunity to assess formerly opaque aspects of operations, and empower investors to better monitor managers. Chapter 2 takes advantage of a new phenomenon, the disclosure of foreign cash holdings, and investigates how investors of US multinational firms value foreign cash holdings, especially relative to domestic cash holdings. Despite the significance of foreign operations and their liquidity condition, investors can only access and monitor foreign cash holdings when they become publicly disclosed. Using the same firm's domestic cash as the benchmark, I find that foreign cash is not discounted by investors. To further shed light on this result, I provide cross-sectional evidence that firms who need to incur significant repatriation tax to bring back foreign cash to the US do not have less valuable foreign cash than firms who can access foreign cash relatively tax-free. Therefore, the foremost reason that renders foreign cash different from domestic cash, the repatriation tax, is not a significant factor in the eyes of investors, possibly because they expect either sophisticated tax-planning by firms or another tax holiday. That is, for investors, who actually have a stake in the multinational firms, foreign and domestic cash are not as different as policymakers or the media make them out to be.

Although the valuation of cash holdings is a relatively large literature, no prior study attempts to decompose cash into domestic and foreign parts due to lack of disclosure. Chapter 2 is

the first study to value the actual foreign cash holdings and provide direct evidence on the subject. Chapter 2 is also the first study to point out the semi-voluntary nature of foreign cash disclosure, as many firms are pressured into disclosing foreign cash by the SEC's comment letters. One important caveat is that the conclusion drawn from this study is only as good as the valuation model. I use the model that is specifically designed to value cash holdings and widely used in prior accounting and finance literature. However, one can argue that there is potential measurement error or misspecification in the model.⁵² I try variants of the model and add different control variables, and the conclusion remains the same. Whether we can further improve the cash valuation model remains an open question and a topic for future research.

Aside from the regulators' demand, new disclosures can also arise from market forces. One of such disclosures is conference presentations, where a variety of organizations hold conferences and invite managers to present in front of a targeted audience. This channel has grown increasingly popular due to its cost-efficient way to bring together managers and conference participants such as investors, analysts and business associates. Chapter 3 examines this understudied voluntary disclosure and its effect on firms' information environments, including analyst forecast properties, stock price informativeness and liquidity. I find that the effect of conference presentations on presenting firms' information environments depend on the sponsors. Only broker-hosted conferences have a consistently positive effect on all aspects of the information environment examined. Conferences held by investor relation firms, analyst societies, the media etc.- that is, conferences aimed at marketing firms rather than facilitating information exchange- either have mildly positive or insignificant relation with the information environment proxies. Conferences

⁵² The variable of interest in the valuation model is the change in cash holdings. The implied assumption is that the best predictor of cash holdings in the current year is cash holdings in the last year, so the change in cash holdings represents the shock, or the surprise component (similar to using the change in earnings as a measure of earnings surprise). However, this could be a noisy proxy that contains measurement errors, and the estimated coefficients might be attenuated relative to the true coefficients.

held by trade associations actually hurt analyst forecasts, create more idiosyncratic risk and reduce stock liquidity, possibly due to the unreliable disclosure at such conferences caused by CEOs' incentive to exaggerate the prospect of new products or the inherently uncertain nature of product-related news. These results highlight the importance of the disclosure venue. Only conferences facilitated by the most capital-market-oriented party are the most effective at improving the information environment, whereas more marketing-like conferences have a limited effect. For future researchers who intend to use conference presentations as disclosure policy measure, Chapter 3 shows that it is important to classify conferences into different categories. Future research could also further explore conference presentations through delving into the conference transcripts and pinpoint the exact information disclosed at different types of conferences.

Tables

Table 2.1: Domestic and foreign cash holdings disclosure across years

This table describes sample distribution across years and descriptive statistics of variables of interest hand-collected from 10-K filings of US multinational firms in fiscal year 2010 to 2013 on COMPUSTAT.

Panel A: Disclosure rate and the comments on foreign cash by the SEC

Fiscal Year	No. of Disclosed Firms	No. of Total Firms	Disclosure Rate	No. of Comments	Comment Rate^a
2010	102	836	12.20%	92	12.53%
2011	405	834	48.56%	41	9.56%
2012	554	905	61.22%	14	4.00%
2013	270	400	67.50%	1	N/A ^b

a. Comment Rate=No. of Comments/(No. of Total Firms-No. of Disclosed Firms).

b. All the information is as of March 28, 2014, so the SEC's review process for fiscal year 2013 is incomplete.

Panel B: Descriptive statistics for hand-collected data from 10-K filings

Variable	N	Min	Q1	Mean	Median	Q3	Max	Std. dev.
Domestic Cash	1331	0	27.4	708	123	414	63,751	2,665
Domestic Cash/TA	1331	0	0.017	0.103	0.063	0.14	0.828	0.121
Foreign Cash	1331	0	46.6	1232	167	572	69,620	4,823
Foreign Cash/TA	1331	0	0.032	0.104	0.073	0.144	0.720	0.099
Foreign/Total	1331	0	0.317	0.557	0.572	0.805	1.000	0.287
PRE	2975	0.1	34.6	1891	186	853	108,000	6,806
PRE/TA	2975	0	0.036	0.154	0.107	0.23	0.916	0.15
Repatriated Tax	443	0	5.8	642	40	251	24,400	2,291
Repatriated Tax/TA	443	0	0.003	0.037	0.019	0.056	0.198	0.046

Table 2.2: Descriptive statistics

This table includes descriptive statistics for variables used in the analyses of the SEC's comment decision, US multinational firms' disclosure of foreign cash holdings decision and the valuation of foreign cash holdings. All the continuous variables are winsorized at 1% and 99% level. Variable definitions are presented in Appendix A.

Panel A: Descriptive statistics for the SEC's comment decision and the firms' disclosure decision

Variable	N	Min	Q1	Mean	Median	Q3	Max	Std. dev.
disclosure1	2975	0.000	0.000	0.447	0.000	1.000	1.000	0.497
disclosure2	2975	0.000	0.000	0.478	0.000	1.000	1.000	0.500
fcashcomment	1644	0.000	0.000	0.090	0.000	0.000	1.000	0.286
commentbefore	2975	0.000	0.000	0.107	0.000	0.000	1.000	0.309
peercomment	2975	0.000	0.000	0.604	1.000	1.000	1.000	0.489
weakness	2975	0.000	0.000	0.029	0.000	0.000	1.000	0.167
restatement	2975	0.000	0.000	0.050	0.000	0.000	1.000	0.218
highvol	2975	0.000	0.000	0.496	0.000	1.000	1.000	0.500
size	2975	1.658	6.523	7.718	7.679	8.873	13.348	1.797
age	2975	0.220	2.597	2.996	3.013	3.685	4.489	0.850
roa	2975	-0.976	0.025	0.051	0.056	0.091	0.480	0.086
bus_segments	2975	1.000	1.000	2.556	2.000	4.000	10.000	1.831
geo_segments	2975	1.000	2.000	4.215	4.000	5.000	29.000	2.770
tobinq	2975	0.446	1.217	1.909	1.580	2.183	13.798	1.119
salesgrowth	2975	-0.807	0.009	0.112	0.078	0.179	4.645	0.220
ma	2975	0.000	0.000	0.406	0.000	1.000	1.000	0.491
restructuring	2975	0.000	0.000	0.527	1.000	1.000	1.000	0.499
extfinancing	2975	-0.581	-0.064	-0.020	-0.021	0.012	0.966	0.102
litigation	2975	0.000	0.000	0.346	0.000	1.000	1.000	0.476
big4	2975	0.000	1.000	0.919	1.000	1.000	1.000	0.273
institution	2975	0.001	0.656	0.754	0.804	0.909	1.000	0.207
analysts	2975	0.000	1.609	2.211	2.303	2.833	4.025	0.841
duality	2975	0.000	0.000	0.496	0.000	1.000	1.000	0.500
totalcash	2975	0.001	0.066	0.190	0.144	0.269	0.897	0.161
pre	2975	0.000	0.036	0.154	0.107	0.229	0.916	0.150
taxdisclosure	2975	0.000	0.000	0.149	0.000	0.000	1.000	0.356
nonbinding	2975	0.000	0.000	0.711	1.000	1.000	1.000	0.453
freecashflow	2975	-0.553	0.050	0.085	0.083	0.123	0.746	0.074
rnd	2975	0.000	0.000	0.058	0.018	0.088	1.831	0.091

Panel B: Descriptive statistics for valuation models

Variable	N	Min	Q1	Mean	Median	Q3	Max	Std. dev.
ar	544	-0.714	-0.184	0.012	0.001	0.149	3.818	0.342
Δcash	544	-0.525	-0.020	0.006	0.009	0.037	0.453	0.080
Δdcash	544	-0.501	-0.024	-0.004	0.000	0.020	0.281	0.067
Δfcash	544	-0.246	-0.005	0.010	0.007	0.024	0.413	0.051
Δdomearnings	544	-0.922	-0.011	0.003	0.001	0.013	0.723	0.089
Δforearnings	544	-0.379	-0.008	-0.002	0.001	0.007	0.665	0.052
Δnetassets	544	-1.126	-0.005	0.051	0.034	0.089	1.638	0.191
Δrd	544	-0.089	0.000	0.002	0.001	0.004	0.069	0.010
Δinterest	544	-0.051	-0.001	0.001	0.000	0.001	0.198	0.012
Δdividends	544	-0.426	0.000	0.004	0.000	0.002	0.440	0.036
cash _{t-1}	544	0.003	0.078	0.189	0.143	0.237	1.346	0.175
dcash _{t-1}	544	0.000	0.018	0.093	0.053	0.116	1.115	0.126
fcash _{t-1}	544	0.000	0.033	0.096	0.067	0.122	0.652	0.096
lev	544	0.000	0.040	0.151	0.120	0.227	0.781	0.141
netfinancing	544	-0.635	-0.042	-0.002	-0.011	0.011	0.907	0.113
log_assets	544	3.435	6.932	8.040	8.014	9.140	12.222	1.600
noex21	544	0.000	0.000	0.039	0.000	0.000	1.000	0.193
hide	544	0.000	0.000	0.285	0.000	1.000	1.000	0.452
forcountries	523	1.000	8.000	20.532	17.000	29.000	94.000	16.563
central	523	0.000	0.000	0.057	0.000	0.000	1.000	0.233
forgrowth	448	-0.327	0.012	0.114	0.064	0.131	9.198	0.472
domgrowth	448	-0.500	-0.005	0.046	0.040	0.083	1.557	0.145
nonbinding	544	0.000	0.000	0.724	1.000	1.000	1.000	0.447
taxdisclosure	544	0.000	0.000	0.176	0.000	0.000	1.000	0.382

Table 2.3: Determinants of the SEC's comment decision

This table reports the results of the Probit model of how likely a firm receives a comment on foreign cash holdings from the SEC. Marginal effects reported above correspond to the change in probability of receiving a comment on foreign cash holdings from the SEC given one standard deviation change in the independent variables. Z-statistics in the brackets are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively.

Variable	All Years (1)	Exclude Year 2013 (2)	All Years (3)	Exclude Year 2013 (4)
weakness	0.035 [0.929]	0.037 [0.905]	0.033 [0.903]	0.035 [0.888]
restatement	0.037 [1.619]	0.04 [1.626]	0.039* [1.710]	0.043* [1.743]
highvol	0.016 [0.992]	0.019 [1.073]	0.018 [1.096]	0.021 [1.201]
size	0.064*** [4.076]	0.070*** [4.127]	0.060*** [3.735]	0.066*** [3.814]
age	-0.008 [-0.966]	-0.009 [-1.014]	-0.011 [-1.250]	-0.012 [-1.308]
roa	0.002 [0.269]	0.002 [0.221]	-0.003 [-0.345]	-0.004 [-0.439]
bus_segments	-0.018** [-2.474]	-0.020** [-2.562]	-0.015** [-2.021]	-0.017** [-2.092]
geo_segments	0.006 [1.098]	0.007 [1.126]	0.004 [0.761]	0.005 [0.772]
tobinq	-0.019* [-1.888]	-0.021* [-1.915]	-0.022* [-1.895]	-0.024* [-1.932]
salesgrowth	-0.016* [-1.761]	-0.017* [-1.790]	-0.014 [-1.618]	-0.016* [-1.647]
ma	-0.025* [-1.647]	-0.025 [-1.523]	-0.021 [-1.358]	-0.02 [-1.222]
restructuring	0.022 [1.531]	0.022 [1.418]	0.019 [1.346]	0.018 [1.216]
extfinancing	-0.001 [-0.163]	-0.001 [-0.102]	-0.001 [-0.197]	-0.001 [-0.150]
litigation	0.013 [0.754]	0.011 [0.550]	0.012 [0.674]	0.009 [0.453]
big4	-0.014 [-0.510]	-0.016 [-0.542]	-0.01 [-0.381]	-0.011 [-0.409]
institution	0.012 [1.445]	0.013 [1.395]	0.012 [1.477]	0.013 [1.425]
analysts	-0.006 [-0.466]	-0.007 [-0.455]	-0.005 [-0.346]	-0.005 [-0.363]
duality	0.001 [0.054]	0.003 [0.228]	-0.006 [-0.445]	-0.004 [-0.281]
totalcash			0.005 [0.576]	0.006 [0.645]
pre			0.022*** [3.498]	0.024*** [3.534]
taxdisclosure			-0.041* [-1.828]	-0.044* [-1.831]
nonbinding			0.013 [0.779]	0.017 [0.979]
Industry & Year FE	Yes	Yes	Yes	Yes
Observations	1644	1513	1644	1513
Pseudo R-square	15.36%	14.11%	16.74%	15.61%

Table 2.4: Determinants of firms' disclosure decision

This table reports the results of the Probit model of how likely a firm chooses to disclose its foreign cash holdings. Marginal effects reported above correspond to the change in probability of disclosing foreign cash holdings given one standard deviation change in the independent variables. Z-statistics in the brackets are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively.

Variable	All Years	Exclude Year 2010	All Years	Exclude Year 2010
	Disclosure1 (1)	Disclosure1 (2)	Disclosure2 (3)	Disclosure2 (4)
commentbefore	0.225*** [5.367]	0.256*** [5.265]	0.213*** [4.839]	0.235*** [4.742]
peercomment	0.084*** [3.195]	0.051 [1.404]	0.099*** [3.787]	0.060* [1.681]
weakness	0.03 [0.581]	0.056 [0.844]	0.048 [0.975]	0.083 [1.337]
restatement	-0.092** [-2.365]	-0.144*** [-2.948]	-0.089** [-2.421]	-0.125*** [-2.675]
highvol	-0.003 [-0.181]	-0.012 [-0.520]	-0.02 [-1.076]	-0.031 [-1.339]
size	0.060*** [2.790]	0.062** [2.296]	0.067*** [3.128]	0.066** [2.449]
age	-0.008 [-0.695]	-0.008 [-0.530]	-0.006 [-0.525]	-0.005 [-0.358]
roa	0.008 [0.613]	0.01 [0.598]	-0.001 [-0.106]	-0.002 [-0.128]
bus_segments	0.023** [2.012]	0.034** [2.391]	0.026** [2.305]	0.040*** [2.892]
geo_segments	0.020 [1.518]	0.019 [1.132]	0.027** [2.257]	0.029* [1.799]
tobinq	-0.027** [-2.114]	-0.029* [-1.870]	-0.031** [-2.522]	-0.032** [-2.113]
salesgrowth	-0.007 [-0.681]	0.004 [0.378]	-0.004 [-0.450]	0.007 [0.658]
ma	0.050*** [2.613]	0.056** [2.326]	0.060*** [3.132]	0.059** [2.561]
restructuring	-0.021 [-1.017]	-0.03 [-1.191]	-0.014 [-0.731]	-0.018 [-0.734]
extfinancing	-0.016* [-1.872]	-0.023** [-2.038]	-0.014 [-1.617]	-0.020* [-1.819]
litigation	-0.041 [-1.151]	-0.043 [-0.971]	-0.041 [-1.179]	-0.048 [-1.116]
big4	0.109** [2.441]	0.123** [2.285]	0.115*** [2.592]	0.128** [2.462]

Variable	All Years	Exclude Year 2010	All Years	Exclude Year 2010
	Disclosure1 (1)	Disclosure1 (2)	Disclosure2 (3)	Disclosure2 (4)
institution	0.009 [0.813]	0.016 [1.153]	0.004 [0.379]	0.01 [0.729]
analysts	-0.026 [-1.505]	-0.026 [-1.179]	-0.023 [-1.292]	-0.019 [-0.904]
duality	-0.046** [-2.135]	-0.048* [-1.822]	-0.045** [-2.137]	-0.052** [-2.016]
totalcash	0.056*** [3.924]	0.066*** [3.536]	0.057*** [4.017]	0.071*** [3.834]
pre	0.056*** [4.348]	0.068*** [4.148]	0.069*** [5.225]	0.083*** [4.775]
taxdisclosure	0.013 [0.424]	0.026 [0.686]	0.011 [0.349]	0.026 [0.683]
nonbinding	-0.011 [-0.508]	-0.026 [-0.917]	0.01 [0.442]	-0.002 [-0.071]
freecashflow	-0.011 [-1.002]	-0.025* [-1.691]	-0.011 [-1.000]	-0.023 [-1.554]
rnd	0.001 [0.091]	-0.005 [-0.363]	-0.007 [-0.563]	-0.015 [-1.025]
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	2975	2139	2975	2139
Pseudo R-square	23.08%	12.15%	24.31%	13.92%

Table 2.5: Valuation of domestic and foreign cash holdings

This table reports the results of the valuation of domestic and foreign cash holdings. t-statistics reported under the coefficients are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively. Variables of interests are in boldface type.

Variable	(1)	(2)	(3)	(4)
Δdcash	1.211** [2.574]		0.869* [1.874]	1.620*** [3.406]
Δfcash	1.236*** [3.004]		2.054*** [3.473]	1.808*** [3.374]
Δ cash		1.671*** [3.731]		
Δ domearnings	0.087 [0.359]	0.069 [0.303]	0.061 [0.247]	0.083 [0.361]
Δ forearnings	1.756** [2.152]	1.743** [2.296]	1.673** [2.202]	1.738** [2.312]
Δ netassets	0.333 [1.641]	0.398* [1.812]	0.360* [1.694]	0.391* [1.777]
Δ rd	1.509 [0.738]	1.769 [0.868]	1.536 [0.763]	1.718 [0.844]
Δ interest	1.459 [1.058]	1.750 [1.204]	1.680 [1.172]	1.718 [1.200]
Δ dividends	1.178*** [3.462]	1.221*** [4.455]	1.173*** [3.823]	1.216*** [4.376]
cash _{t-1}	0.394** [2.365]			
dcash _{t-1}		0.664*** [2.742]	0.635*** [2.610]	0.644*** [2.867]
fcash _{t-1}		0.129 [0.872]	0.158 [0.923]	0.138 [0.900]
lev	-0.144 [-1.103]	-0.141 [-1.100]	-0.156 [-1.218]	-0.144 [-1.123]
netfinancing	-0.506* [-1.879]	-0.580** [-2.061]	-0.537* [-1.942]	-0.564** [-1.970]
Δ cash \times cash _{t-1}	-0.156 [-0.169]			
Δcash\timesdcash_{t-1}		1.257 [1.276]		1.283 [1.265]
Δcash\timesfcash_{t-1}		-5.300*** [-2.612]		-5.513*** [-2.496]
Δdcash\timesdcash_{t-1}			1.283 [1.619]	

Variable	(1)	(2)	(3)	(4)
$\Delta\text{fcash}\times\text{fcash}_{t-1}$			-4.801*** [-3.400]	
$\Delta\text{cash}\times\text{lev}$	1.304 [1.276]	1.889* [1.674]		1.876* [1.667]
$\Delta\text{dcash}\times\text{lev}$			1.853 [1.369]	
$\Delta\text{fcash}\times\text{lev}$			1.375 [1.336]	
log_assets	0.028*** [2.875]	0.030*** [3.103]	0.031*** [3.124]	0.030*** [3.098]
Mills	0.093 [1.583]	0.082 [1.411]	0.085 [1.393]	0.082 [1.414]
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	544	544	544	544
Adj. R-Squared	25.63%	28.75%	27.69%	28.67%
F tests				
$\Delta\text{dcash}=\Delta\text{fcash}$	p-val=0.952		p-val=0.084	p-val=0.675
$\Delta\text{cash}\times\text{dcash}_{t-1}=\Delta\text{cash}\times\text{fcash}_{t-1}$	p-val=0.007			
$\Delta\text{dcash}\times\text{dcash}_{t-1}=\Delta\text{fcash}\times\text{fcash}_{t-1}$			p-val=0.000	p-val=0.012

Table 2.6: Repatriation tax and the valuation of foreign cash holdings

This table reports the results of the relationship between the repatriation tax and the valuation of foreign cash holdings. t-statistics reported under the coefficients are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively. Variables of interests are in boldface type.

Variable	(1)	(2)
Δ cash	0.454 [0.789]	0.622 [1.121]
Δ fcash	0.551 [0.663]	0.211 [0.413]
nonbinding	-0.011 [-0.370]	
Δ cash \times nonbinding	1.198** [2.495]	
Δfcash\timesnonbinding	0.946 [1.121]	
taxdisclosure		0.020 [0.505]
Δ cash \times taxdisclosure		1.910** [2.102]
Δfcash\timestaxdisclosure		3.079** [2.271]
Δ domearnings	0.029 [0.114]	0.087 [0.389]
Δ forearnings	1.673** [2.091]	1.474*** [2.746]
Δ netassets	0.339* [1.652]	0.390* [1.869]
Δ rd	1.099 [0.532]	1.325 [0.724]
Δ interest	1.609 [1.206]	1.036 [0.808]
Δ dividends	1.054*** [2.761]	1.221*** [3.118]
cash _{t-1}	0.399** [2.447]	0.265** [2.531]
lev	-0.157 [-1.194]	-0.096 [-0.781]
netfinancing	-0.490* [-1.772]	-0.587** [-2.122]
Δ cash \times cash _{t-1}	-0.415 [-0.465]	-0.011 [-0.015]
Δ cash \times lev	1.375 [1.341]	2.109** [2.202]
log_assets	0.030*** [3.081]	0.021** [2.274]
Mills	0.095 [1.623]	0.088 [1.590]
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	544	544
Adj. R-Squared	26.21%	31.26%

Table 2.7: Agency problems of foreign operations and the valuation of foreign cash holdings

This table reports the results of the relationship between agency problems of foreign operations and the valuation of foreign cash holdings. t-statistics reported under the coefficients are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively. Variables of interests are in boldface type.

Variable	(1)	(2)	(3)	(4)
Δ dcash	1.001** [2.118]	1.256** [2.547]	1.442** [2.231]	1.126** [2.057]
Δ fcash	1.324*** [3.020]	1.965*** [3.196]	2.266*** [2.628]	1.126*** [2.591]
noex21	-0.163** [-2.397]			
Δ dcash \times noex21	-2.851 [-1.232]			
Δfcash\timesnoex21	-2.876* [-1.936]			
hide		-0.051* [-1.698]		
Δ dcash \times hide		-0.420 [-0.789]		
Δfcash\timeshide		-2.013* [-1.943]		
forcountries			0.001 [0.929]	
Δ dcash \times forcountries			-0.034 [-1.472]	
Δfcash\timesforcountries			-0.052* [-1.781]	
central				-0.068 [-1.277]
Δ dcash \times central				-0.301 [-0.255]
Δfcash\timescentral				1.817** [2.210]
Δ domearnings	0.120 [0.476]	0.010 [0.040]	0.114 [0.451]	0.021 [0.083]
Δ forearnings	1.544** [2.220]	1.765** [2.529]	1.580*** [2.744]	1.789** [2.131]
Δ netassets	0.320 [1.599]	0.337* [1.650]	0.351* [1.679]	0.321 [1.583]
Δ rd	1.325 [0.687]	1.264 [0.685]	1.166 [0.551]	1.412 [0.690]
Δ interest	1.277 [0.974]	1.437 [1.032]	1.272 [0.974]	1.719 [1.196]
Δ dividends	1.181*** [3.465]	1.254*** [3.645]	1.248*** [3.834]	1.225*** [3.428]
cash _{t-1}	0.489*** [2.977]	0.398*** [2.666]	0.526*** [3.022]	0.406** [2.457]
lev	-0.195 [-1.549]	-0.188 [-1.465]	-0.175 [-1.393]	-0.186 [-1.418]

Variable	(1)	(2)	(3)	(4)
netfinancing	-0.462*	-0.504*	-0.492*	-0.479*
	[-1.721]	[-1.872]	[-1.752]	[-1.775]
$\Delta\text{cash}\times\text{cash}_{t-1}$	0.681	0.035	0.701	-0.050
	[0.715]	[0.046]	[0.759]	[-0.051]
$\Delta\text{cash}\times\text{lev}$	0.851	1.390	1.567	1.912
	[0.951]	[1.435]	[1.501]	[1.118]
log_assets	0.027***	0.031***	0.024**	0.032***
	[2.664]	[3.038]	[2.133]	[2.977]
Mills	0.129**	0.112**	0.143**	0.086
	[2.208]	[1.987]	[2.339]	[1.438]
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	544	544	523	523
Adj. R-Squared	27.83%	28.29%	30.43%	26.28%

Table 2.8: Foreign growth opportunities and the valuation of foreign cash holdings

This table reports the results of the relationship between growth opportunities and the valuation of foreign cash holdings. t-statistics reported under the coefficients are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively. Variables of interests are in boldface type.

Variable	(1)	(2)
Δ dcash	0.867* [1.710]	1.335** [2.501]
Δ fcash	0.802** [2.038]	1.252*** [2.876]
forgrowth	0.071** [2.062]	
Δ dcash \times forgrowth	3.145** [2.010]	
Δfcash\timesforgrowth	5.164*** [2.699]	
domgrowth		-0.189 [-1.527]
Δ dcash \times domgrowth		-0.091 [-0.066]
Δfcash\timesdomgrowth		1.224 [1.462]
Δ domearnings	0.030 [0.132]	0.005 [0.023]
Δ forearnings	0.952*** [2.613]	0.826** [2.201]
Δ netassets	0.311 [1.525]	0.318 [1.569]
Δ rd	0.657 [0.350]	0.539 [0.274]
Δ interest	0.515 [0.333]	0.668 [0.455]
Δ dividends	1.376*** [3.167]	1.323*** [3.313]
cash _{t-1}	0.368** [2.367]	0.355** [2.169]
lev	-0.158 [-1.160]	-0.210 [-1.546]
netfinancing	-0.577** [-2.110]	-0.555** [-2.081]
Δ cash \times cash _{t-1}	0.650 [1.044]	0.091 [0.131]
Δ cash \times lev	0.877 [0.976]	0.508 [0.498]
log_assets	0.026** [2.437]	0.025** [2.287]
Mills	0.129* [1.898]	0.141** [2.083]
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	448	448
Adj. R-Squared	20.16%	17.96%

Table 2.9: Valuation of estimated foreign cash holdings

This table reports the results of the valuation of estimated domestic and foreign cash holdings. t-statistics reported under the coefficients are based on standard errors clustered at firm level. *, **, and *** denote significance at 10%, 5% and 1% level, respectively. Variables of interests are in boldface type.

Panel A: The valuation model used in Thakor and CDKS

Variable	Thakor	CDKS
Δ cash	1.002*** (3.924)	1.001*** (4.507)
Δ domearnings	0.358*** (3.085)	0.357*** (3.095)
Δ forearnings	1.006*** (5.115)	0.829*** (4.155)
Δ netassets	0.188*** (2.992)	0.220*** (3.278)
Δ rd	-0.439 (-0.501)	-0.343 (-0.380)
Δ interest	-0.142 (-0.108)	0.171 (0.134)
Δ dividends	0.768*** (3.686)	0.748*** (3.470)
dcash_estimate _{t-1}	0.203*** (3.014)	0.210** (2.426)
fcash_estimate _{t-1}	-0.962** (-2.102)	0.165* (1.692)
lev	-0.279*** (-4.797)	-0.304*** (-5.278)
netfinancing	-0.326*** (-2.636)	-0.350*** (-2.745)
Δ cash \times dcash_estimate _{t-1}	-0.238 (-0.526)	1.029* (1.856)
Δ cash \times fcash_estimate _{t-1}	2.367 (0.940)	-1.098** (-2.063)
Δ cash \times lev	0.402 (0.672)	0.511 (0.919)
log_assets	0.013*** (2.617)	0.014*** (2.625)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,461	1,461
Adj. R-Squared	19.23%	19.20%
F tests		
Δ cash \times dcash _{t-1} = Δ cash \times fcash _{t-1}	p-val=0.308	p-val=0.007

Panel B: My alternative specification of the valuation model

Variable	Thakor	CDKS
Δ dcash_estimate	0.764*** (3.557)	1.078*** (4.133)
Δ fcash_estimate	1.739*** (3.967)	1.052*** (3.304)
Δ domearnings	0.370*** (3.127)	0.340*** (3.020)
Δ forearnings	1.169*** (5.542)	0.824*** (4.117)
Δ netassets	0.199*** (3.071)	0.215*** (3.156)
Δ rd	-0.387 (-0.414)	-0.372 (-0.409)
Δ interest	-0.215 (-0.162)	-0.017 (-0.012)
Δ dividends	0.769*** (3.621)	0.769*** (3.581)
cash _{t-1}	0.174** (2.500)	0.182*** (2.617)
lev	-0.297*** (-5.133)	-0.297*** (-5.186)
netfinancing	-0.314** (-2.471)	-0.357*** (-2.767)
Δ cash \times cash _{t-1}	0.085 (0.182)	-0.194 (-0.415)
Δ cash \times lev	0.673 (1.255)	0.279 (0.443)
log_assets	0.015*** (2.802)	0.014*** (2.728)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,461	1,461
Adj. R-Squared	18.63%	18.66%
F tests		
Δ dcash= Δ fcash	p-val=0.015	p-val=0.908

Table 2.10: Market reactions to Treasury’s crackdown on tax inversions

This table lists the firms involved in inversions and market reactions of US multinational firms, involved in inversions or not, to Treasury’s announcement on September 22, 2014.

Panel A: US Acquirers in Pending or Rumored Inversion Deals

Company Names	Foreign Cash/Total Cash
Medtronic	98%
Mylan	61%
Hospira	44%
Applied Materials	41%
AbbVie	Not disclosed
Auxilium Pharmaceuticals	Not disclosed
Salix Pharmaceuticals	Not disclosed
Burger King Worldwide	Not disclosed
Chiquita Brands	Not disclosed

Panel B: Market-adjusted Returns on September 22, 2014

	Total	Disclosure		Non-Disclosure
Involved in inversion deals	-0.0061 9	-0.0105 4		-0.0026 5
Not involved in inversion deals	-0.0050 910	High Foreign -0.0017 279	Low Foreign -0.0050 280	-0.0077 351

Table 3.1: Descriptive statistics

This table reports descriptive statistics on the variables used in the tests. All the continuous variables are winsorized at 1% and 99%. Variable definitions are presented in Appendix B.

Panel A: Descriptive statistics for analyst forecast properties

Variable	N	Mean	Q1	Median	Q3	Std. Dev.
Errors	27,409	0.019	0.002	0.005	0.014	0.047
Errors-No Hosts	26,910	0.018	0.002	0.005	0.014	0.044
Dispersion	24,746	0.013	0.002	0.004	0.012	0.029
Confs-Broker	27,409	2.790	0.000	1.000	4.000	3.558
Confs-Broker-Trans	27,409	0.814	0.000	0.000	0.000	2.094
Confs-Broker-No Trans	27,409	1.976	0.000	1.000	3.000	2.792
Confs-Trade	27,409	0.249	0.000	0.000	0.000	0.896
Confs-IR	27,409	0.416	0.000	0.000	0.000	1.512
Size	27,409	6.810	5.463	6.690	7.998	1.845
Analyst	27,409	9.657	3.000	7.000	14.000	8.422
Institution	27,409	0.594	0.352	0.647	0.856	0.303
Loss	27,409	0.192	0.000	0.000	0.000	0.394
Growth	27,409	0.134	0.027	0.093	0.190	0.215
R&D	27,409	0.066	0.000	0.000	0.058	0.147
Ret Volatility	27,409	0.120	0.069	0.102	0.150	0.074
Earn Volatility	27,409	1.465	0.462	0.801	1.508	2.368

Panel B: Descriptive statistics for idiosyncratic risk and information asymmetry analysis

Variable	N	Mean	Q1	Median	Q3	Std. Dev.
Idiosyncratic Risk	25,090	0.022	0.005	0.011	0.024	0.031
Inverse Synch	25,090	0.710	0.153	0.657	1.349	0.732
Illiq	25,090	1.793	0.001	0.009	0.147	8.397
Bidask	25,090	-5.983	-7.053	-6.232	-4.943	1.373
Confs-Broker	25,090	2.340	0.000	0.000	4.000	3.536
Confs-Trade	25,090	0.211	0.000	0.000	0.000	0.832
Confs-IR	25,090	0.307	0.000	0.000	0.000	1.124
DD	25,090	0.055	0.024	0.040	0.070	0.049
BM	25,090	0.598	0.269	0.476	0.775	0.548
Size	25,090	6.205	4.739	6.143	7.568	2.070
Lev	25,090	0.197	0.005	0.153	0.317	0.204
CFO	25,090	0.046	0.022	0.080	0.136	0.185
VCFO	25,090	0.082	0.027	0.048	0.089	0.106
Institution	25,090	0.520	0.200	0.559	0.822	0.332
Analyst	25,090	5.549	1.000	3.000	8.000	6.387
Frev ²	25,090	0.499	0.000	0.023	0.203	1.638
Ret	25,090	0.125	-0.239	0.050	0.353	0.580
Ret ²	25,090	0.518	0.021	0.100	0.350	1.378

Panel C: Descriptive statistics for returns and future earnings analysis

Variable	N	Mean	Q1	Median	Q3	Std. Dev.
Ret _t	25,422	0.116	-0.246	0.033	0.329	0.595
Ret _{t+1,t+3}	25,422	0.174	-0.436	-0.013	0.476	0.926
Earn _t	25,422	0.079	-0.014	0.046	0.076	0.690
Earn _{t+1,t+3}	25,422	0.421	-0.114	0.125	0.267	2.560
Earn _{t-1}	25,422	0.043	-0.006	0.043	0.072	0.668
Confs-Broker	25,422	1.962	0.000	0.000	3.000	3.150
Confs-Trade	25,422	0.204	0.000	0.000	0.000	0.886
Confs-IR	25,422	0.233	0.000	0.000	0.000	0.709
Call	25,422	0.437	0.000	0.000	1.000	0.496
MForecast	25,422	0.313	0.000	0.000	1.000	0.464
Size	25,422	6.287	4.819	6.204	7.621	2.053
Analyst	25,422	4.920	0.000	3.000	7.000	5.909

Table 3.2: Conference presentations and analyst forecast accuracy and dispersion

This table reports the results of analyst forecast properties. Firm and year fixed effects are included for each model. Coefficient *t*-statistics are in parentheses. The standard errors are clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the appendix. Coefficients of interest are in boldface type.

Variables	(1) Errors _t	(2) Errors-No Host _t	(3) Dispersion _t
Confs-Broker_t	-0.0003** (-2.308)		-0.0002** (-1.974)
Confs-Broker-Trans_t		-0.0004** (-2.385)	
Confs-Broker-No Trans_t		-0.0001 (-0.558)	
Confs-Trade_t	0.0008*** (3.386)	0.0006*** (2.865)	0.0004** (2.476)
Confs-IR_t	-0.0002** (-2.107)	-0.0002* (-1.877)	-0.0001* (-1.798)
Size _t	-0.0243*** (-19.244)	-0.0222*** (-19.956)	-0.0169*** (-19.890)
Analyst _t	0.0004*** (3.995)	0.0004*** (3.723)	0.0004*** (6.400)
Institution _t	0.0014 (0.468)	-0.0002 (-0.081)	-0.0018 (-0.913)
Loss _t	0.0367*** (18.316)	0.0355*** (18.877)	0.0194*** (15.086)
Growth _t	0.0127*** (3.870)	0.0107*** (3.711)	0.0056*** (2.777)
R&D _t	0.0028 (0.293)	-0.0005 (-0.049)	-0.0126* (-1.851)
Ret Volatility _t	0.0114 (1.430)	0.0093 (1.270)	0.0152*** (2.703)
Earn Volatility _t	0.0001 (0.116)	0.0000 (0.005)	0.0001 (0.125)
Firm FEs	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes
No. of Obs	27,409	26,910	24,746
Adj. R-Square	45.58%	46.49%	45.51%

Table 3.3: Conference presentations and idiosyncratic risk

This table reports the results of idiosyncratic risk. Firm and year fixed effects are included for each model. The standard errors are clustered at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the appendix. Coefficients of interest are in boldface type.

Variables	(1) Irisk	(2) Invsynch
Confs-Broker_t	-0.0003*** (-3.476)	-0.0045*** (-2.663)
Confs-Trade_t	0.0004*** (2.929)	0.0203*** (3.801)
Confs-IR_t	0.0001 (1.166)	0.0020 (0.655)
DD _{t-1}	-0.0142 (-1.630)	-0.3391** (-2.534)
BM _{t-1}	0.0052*** (5.448)	0.0164 (1.472)
Size _{t-1}	-0.0116*** (-16.450)	-0.2072*** (-17.779)
Lev _{t-1}	0.0126*** (5.269)	-0.0179 (-0.498)
CFO _{t-1}	-0.0194*** (-7.689)	-0.0631** (-2.090)
CFO _{t+1}	0.0011 (0.406)	-0.0103 (-0.373)
VCFO _{t-1}	0.0268*** (4.994)	0.1165* (1.848)
Analyst _{t-1}	0.0002*** (5.302)	0.0023** (2.117)
Institution _{t-1}	-0.0073*** (-3.772)	-0.3719*** (-10.742)
Ret ² _{t-1}	0.0004*** (3.063)	-0.0089*** (-4.198)
Ret _t	-0.0032*** (-5.933)	-0.0663*** (-9.876)
FREV ² _{t-1}	0.0001 (1.100)	-0.0036* (-1.917)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
No. of Obs	25,090	25,090
Adj. R-Square	59.08%	79.55%

Table 3.4: Conference presentations and future earnings response coefficient (FERC)

This table reports the results of the returns-earnings relation. Coefficient t-statistics are reported in the parentheses below the coefficients using standard errors clustered at the firm level. Firm and year fixed effects are included. Detailed variable definitions are in the Appendix. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables of interests are in boldface type.

Variables	(1)	(2)	(3)
Earn _{t-1}	-0.244*** (-11.226)	-0.172*** (-8.294)	-0.096** (-2.095)
Earn _t	0.083*** (4.720)	0.079*** (4.508)	0.220*** (3.648)
Earn _{t+1,t+3}	0.042*** (8.159)	0.029*** (6.549)	0.059*** (3.032)
Ret _{t+1,t+3}	-0.208*** (-29.633)	-0.212*** (-23.790)	-0.308*** (-14.557)
Confs-Broker _t	-0.015*** (-5.668)	-0.010*** (-3.768)	0.009*** (3.966)
Confs-Broker _t ×Earn _{t-1}	-0.024*** (-2.657)	-0.006 (-0.934)	-0.003 (-0.590)
Confs-Broker _t ×Earn _t	-0.034*** (-4.595)	-0.026*** (-3.014)	-0.014* (-1.850)
Confs-Broker_t×Earn_{t+1,t+3}	0.008** (2.532)	0.005** (2.364)	0.003* (1.650)
Confs-Broker _t ×Ret _{t+1,t+3}	-0.000 (-0.219)	0.000 (0.112)	0.005*** (3.025)
Confs-Trade _t	0.012** (2.454)	0.014*** (2.838)	0.015*** (3.711)
Confs-Trade _t ×Earn _{t-1}	-0.100** (-2.106)	-0.110** (-2.372)	-0.076** (-2.000)
Confs-Trade _t ×Earn _t	-0.082 (-1.344)	-0.079 (-1.351)	-0.059 (-1.203)
Confs-Trade_t×Earn_{t+1,t+3}	-0.028 (-1.338)	-0.038** (-1.985)	-0.032* (-1.932)
Confs-Trade _t ×Ret _{t+1,t+3}	0.003 (0.281)	0.004 (0.419)	-0.004 (-0.422)
Confs-IR _t	0.003 (0.486)	0.005 (0.718)	0.001 (0.236)
Confs-IR _t ×Earn _{t-1}	-0.084** (-2.077)	-0.046 (-1.408)	-0.012 (-0.464)
Confs-IR _t ×Earn _t	0.073 (1.609)	0.072* (1.655)	0.018 (0.468)
Confs-IR_t×Earn_{t+1,t+3}	0.006 (0.296)	-0.024 (-1.373)	-0.011 (-0.685)
Confs-IR _t ×Ret _{t+1,t+3}	-0.005 (-0.594)	-0.003 (-0.404)	0.002 (0.291)
Call _t		-0.167*** (-5.283)	-0.019 (-1.187)
Call _t ×Earn _{t-1}		-0.229*** (-6.275)	0.041 (0.628)
Call _t ×Earn _t		0.044 (0.863)	-0.020 (-0.235)
Call _t ×Earn _{t+1,t+3}		0.084*** (3.649)	0.130*** (3.611)

Variables	(1)	(2)	(3)
Call _t ×Ret _{t+1,t+3}		-0.012 (-1.169)	0.014 (1.430)
MForecast _t		-0.093*** (-5.005)	-0.043 (-1.603)
MForecast _t ×Earn _{t-1}		-0.077 (-0.987)	-0.091** (-2.541)
MForecast _t ×Earn _t		0.025 (0.250)	0.040 (0.780)
MForecast _t ×Earn _{t+1,t+3}		0.214*** (4.910)	0.062*** (2.898)
MForecast _t ×Ret _{t+1,t+3}		0.016 (1.512)	0.004 (0.422)
Size _t			-0.549*** (-38.020)
Size _t ×Earn _{t-1}			0.012** (2.094)
Size _t ×Earn _t			-0.018** (-2.464)
Size _t ×Earn _{t+1,t+3}			-0.006*** (-2.809)
Size _t ×Ret _{t+1,t+3}			0.005 (1.530)
Analyst _t			0.001 (0.991)
Analyst _t ×Earn _{t-1}			-0.012*** (-2.884)
Analyst _t ×Earn _t			0.005 (0.934)
Analyst _t ×Earn _{t+1,t+3}			0.006*** (4.149)
Analyst _t ×Ret _{t+1,t+3}			-0.001 (-1.059)
Firm FEs	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes
No. of Obs	25,422	25,422	25,422
Adj. R-Squared	34.60%	36.75%	54.04%

Table 3.5: Conference presentations and liquidity

This table reports the results of illiquidity. Firm and year fixed effects are included for each model. The standard errors are clustered at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the appendix. Coefficients of interest are in boldface type.

Variables	(1) Illiq	(2) Bidask
Confs-Broker_t	-0.0478*** (-3.132)	-0.0042** (-2.456)
Confs-Trade_t	0.1561*** (4.216)	-0.0021 (-0.670)
Confs-IR_t	-0.0447** (-2.260)	0.0025 (0.942)
DD _{t-1}	-2.0829 (-0.735)	-0.0007 (-0.005)
BM _{t-1}	1.8074*** (5.191)	0.0631*** (5.297)
Size _{t-1}	-2.3317*** (-10.171)	-0.5953*** (-49.106)
Lev _{t-1}	-0.7356 (-1.132)	0.0748* (1.911)
CFO _{t-1}	-1.7919** (-2.433)	-0.1322*** (-4.243)
CFO _{t+1}	0.5241 (0.778)	0.0787*** (2.750)
VCFO _{t-1}	2.9801** (2.075)	-0.0016 (-0.024)
Analyst _{t-1}	0.1011*** (8.209)	-0.0057*** (-5.213)
Institution _{t-1}	0.5856 (1.075)	-0.5650*** (-12.976)
Ret ² _{t-1}	0.0214 (0.676)	-0.0070*** (-3.402)
Ret _t	-1.3685*** (-9.284)	-0.2846*** (-41.114)
FREV ² _{t-1}	-0.1843*** (-8.388)	-0.0008 (-0.387)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
Observations	25,090	25,090
Adj. R-Squared	47.89%	94.61%

Table 3.6: Stock price reversal following conference presentations

This table reports the results of price reversals following conference presentations. Standard errors are clustered by the trading date, and t-statistics are reported in the parentheses below the coefficients. Detailed variable definitions are in the Appendix. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables of interests are in boldface type.

Panel A: Descriptive statistics

Variable	N	Mean	Q1	Median	Q3	Std. Dev.
AR ₀	114,690	0.001	-0.011	0.000	0.012	0.025
AR _{1,5}	114,690	0.001	-0.025	0.000	0.026	0.053
AR _{1,10}	114,690	0.001	-0.035	0.000	0.037	0.074
Size	114,690	7.207	5.860	7.067	8.364	1.868
BM	114,690	0.505	0.225	0.392	0.653	0.424
MOM	114,690	0.150	-0.165	0.080	0.347	0.526
Volume	114,690	0.011	0.004	0.008	0.014	0.012

Panel B: Regression analysis

Variables	Broker		Trade		IR		All	
	(1) AR _{1,5}	(2) AR _{1,10}	(3) AR _{1,5}	(4) AR _{1,10}	(5) AR _{1,5}	(6) AR _{1,10}	(7) AR _{1,5}	(8) AR _{1,10}
AR₀	-0.005 (-0.307)	0.013 (0.703)	-0.086** (-2.386)	-0.154*** (-2.918)	-0.034 (-1.040)	-0.048 (-1.128)	-0.008 (-0.502)	0.006 (0.334)
AR₀*Trade							-0.083** (-2.120)	-0.160*** (-2.932)
Size	-0.000* (-1.673)	-0.000 (-1.410)	0.001** (2.044)	0.001* (1.812)	-0.000** (-2.078)	-0.000 (-0.442)	-0.000 (-1.561)	-0.000 (-0.888)
BM	0.001 (1.206)	0.004*** (3.504)	0.003 (1.046)	0.010*** (2.615)	0.004*** (3.009)	0.007*** (3.574)	0.001** (2.301)	0.005*** (4.984)
MOM	-0.000 (-0.589)	0.000 (0.492)	-0.002 (-1.156)	0.000 (0.113)	-0.001 (-0.814)	0.001 (0.377)	-0.001 (-1.042)	0.000 (0.602)
Volume	0.038 (1.384)	-0.029 (-0.834)	-0.079 (-1.130)	0.038 (0.399)	0.038 (0.525)	-0.033 (-0.363)	0.031 (1.224)	-0.024 (-0.756)
No. of Obs	93,183	93,183	8,326	8,326	13,181	13,181	114,690	114,690
Adj. R-Square	0.02%	0.05%	0.31%	0.47%	0.22%	0.18%	0.04%	0.09%

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Appendix A: Variable definitions for Chapter 2

Variables for valuation of cash holdings tests	
ar	= The firm's buy-and-hold return during year t minus the buy-and-hold return of corresponding Fama-French 25 portfolios to which the firm belongs to during year t.
dcash	= Domestic cash holdings scaled by market value of equity at the beginning of year t. Domestic cash is collected from 10-K filings.
fcash	= Foreign cash holdings scaled by market value of equity at the beginning of year t. Foreign cash is collected from 10-K filings.
cash	= Total cash holdings scaled by market value of equity at the beginning of year t. Cash is CHE.
domearnings	= Domestic earnings scaled by market value of equity at the beginning of year t. Domestic earnings are the difference between earnings before extraordinary items and foreign earnings. Earnings before extraordinary items are (IB+XINT+TXDI+ITCI), and foreign earnings are defined below.
forearnings	= Foreign earnings scaled by market value of equity at the beginning of year t. Foreign earnings are (PIFO-TXFO-TXDFO).
netassets	= Net assets scaled by market value of equity at the beginning of year t. Net assets are total assets net of cash, (AT-CHE).
rd	= R&D expense scaled by market value of equity at the beginning of year t. R&D expense is XRD, and it is set to zero if XRD is missing.
interest	= Interest expense scaled by market value of equity at the beginning of year t. Interest expense is XINT.
dividends	= Common dividends scaled by market value of equity at the beginning of year t. Common dividends are DVC.
lev	= Market leverage calculated as debt to sum of debt and market value of equity (debt/(PRCC_F*CSHO+ debt)). Debt equals sum of short-term and long-term debt. debt=DLTT+DLC.
netfinancing	= Net financing calculated as sum of new equity issues and new debt issues. New equity issues are (SSTK-PRSTKC). New debt issues are (DLTIS-DLTR).
log_assets	= Log of total assets. Total assets are AT.
noex21	= Indicator variable equal to 1 if the firm does not mention foreign subsidiaries in its Exhibit 21 or does not file an Exhibit 21, and 0 otherwise.
hide	= Indicator variable equal to 1 if the firm underreports foreign subsidiaries in its Exhibit 21 and 0 otherwise. Whether the firms underreports foreign subsidiaries is determined as follows: I first extract foreign subsidiaries from OSIRIS international database. I delete all the foreign subsidiaries that are not firms (foundation, research institute, pension fund etc.) and not owned by the parent by at least 50%. I count the number of unique foreign countries the firm operates in. I then count the number of unique foreign countries the firm reports in its Exhibit 21 from 2010 to 2013 (because OSIRIS data is not a panel and the date when foreign subsidiaries are identified varies from calendar year 2010 to 2014). If the number of unique foreign countries in Exhibit 21 is smaller than the number of unique foreign countries in OSIRIS, the firm is considered underreporting foreign subsidiaries. The number of foreign countries is used instead of the number of foreign subsidiaries because my Perl program can only count how many times a certain country name appears in a text file. Exhibit 21 usually has two columns: subsidiary name and location. If the foreign subsidiary is called Sears Canada and its location is Canada, the word Canada will be counted twice even though there is only one Canadian subsidiary.
forcountries	= Number of foreign countries the firm operates in. Foreign countries are extracted from Exhibit 21.

central	=	Indicator variable equal to 1 if the US parent of the multinational firm controls its foreign subsidiaries' decision-rights, and 0 otherwise. Foreign subsidiaries are considered to have their own decisions-rights if they use the local currency as the functional currency instead of US dollar. When foreign subsidiaries use the local currency, the translation adjustment in accumulated comprehensive income will be non-zero. Translation adjustment is the change in RECTA in COMPUSTAT.
forgrowth	=	Sales growth rate for foreign segments, calculated as $\sqrt[n]{\frac{Sales_t}{Sales_{t-n}}} - 1$, where n is equal to 1 to 5 depending on the length of the time series. Sales for foreign segments are from COMPUSTAT Segment file.
domgrowth	=	Sales growth rate for the US segments, calculated as $\sqrt[n]{\frac{Sales_t}{Sales_{t-n}}} - 1$, where n is equal to 1 to 5 depending on the length of the time series. Sales for the US segments are from COMPUSTAT Segment file.
nonbinding	=	Indicator variable that equals 1 if the firm's foreign tax rate is lower than the US statutory tax rate 35%, and 0 otherwise. Foreign tax rate is calculated as the 1 to 5 years' average of foreign income tax to foreign income (TXFO/PIFO), depending on the length of the time series.
taxdisclosure	=	Indicator variable that equals 1 if the firm discloses the repatriation tax, and 0 otherwise.

Variables for comment and disclosure determinant model

disclosure1	=	Indicator variable for quantitative disclosure. It equals one if the firm discloses the exact foreign cash balances in year t, and 0 otherwise.
disclosure2	=	Indicator variable for quantitative and qualitative disclosure. It equals one if the firm either discloses the exact foreign cash balances or qualitatively describe the extent of foreign cash holdings in year t, and 0 otherwise.
fcashcomment	=	Indicator variable that equals 1 if the firm receives a comment from the SEC that urges the firm to disclose its foreign cash holdings, and 0 otherwise.
commentbefore	=	Indicator variable that equals 1 if the firm's foreign cash issue in the filings of previous years is commented on by the SEC.
weak	=	Indicator variable that equals 1 if the firm's internal control has material weakness, and 0 otherwise.
restatement	=	Indicator variable that equals 1 if the firm restates its earnings, and 0 otherwise.
highvol	=	Indicator variable that equals 1 if the firm's monthly stock return volatility is above the sample median, and 0 otherwise.
size	=	Log of market value of equity (log(PRCC_F*CSHO)).
age	=	Log of the firm's age as of the fiscal year end of year t. Firm i's age is the number of years since the first time the firm appears in CRSP.
roa	=	Income before extraordinary items to total assets (IB/AT).
bus_segments	=	Number of business segments.
geo_segments	=	Number of geographic segments.
tobinq	=	Market value of equity plus total liabilities divided by total assets ((PRCC_F*CSHO+LT)/AT).
salesgrowth	=	Growth in total sales calculated as $\sqrt[n]{\frac{Sales_t}{Sales_{t-n}}} - 1$, where n is equal to 1 to 5 depending on the length of the time series.
ma	=	Indicator variable that equals 1 if the firm is involved in a merger or acquisition (non-zero AQP), and 0 otherwise.

restructuring	=	Indicator variable that equals 1 if the firm has non-zero restructuring costs (RCP), and 0 otherwise.
extfinancing	=	External financing defined as the sum of equity and debt financing scaled by total assets. Equity financing=sales of common and preferred stock-purchases of common stock-dividends (SSTK-PRSTKC-DV). Debt financing=long-term debt issuance-long-term debt reduction-change in current debt (DLTIS-DLTR-DLCCH).
litigation	=	Indicator variable that equals 1 if the firm is in a high litigation risk industry, and 0 otherwise. High litigation risk industries are defined by SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961 or 7370-7374).
big4	=	Indicator variable that equals 1 if the firm has a Big 4 auditor in year t, and 0 otherwise.
institution	=	Institutional ownership before fiscal year end of year t, from Thomson Reuters 13f database.
analysts	=	Log(1+the number of analysts following the firm during year t). The number of analysts is collected from I/B/S/E, and firms not covered by I/B/S/E are assumed to have no analyst.
duality	=	Indicator variable that equals 1 if the firm's CEO is also its chairman of the board of directors, and 0 otherwise.
totalcash	=	Total cash to total assets (CHE/AT).
pre	=	Permanently reinvested earnings to total assets. Permanently reinvested earnings are collected from 10-K filings.
freecashflow	=	Free cash flow to total assets. Free cash flow is operating cash flow minus cash dividends (OANCF-DV).
rnd	=	R&D expense divided by sales (XRD/SALE). Missing value of XRD is set to zero.

Appendix B: Variable definitions for Chapter 3

Confs-Broker	=	Number of broker-hosted conference attended by the firm during year t. In the analyst accuracy analysis, year t is from the earnings announcement of year t-1 to the earnings announcement of year t. In the idiosyncratic risk analysis, year t is the fiscal year t. In the returns and earnings relation analysis, year t is from three months following year t-1 fiscal year end to three months following year t fiscal year end.
Confs-Broker-Trans	=	Number of broker-hosted conference with transcripts attended by the firm during year t.
Confs-Broker-No Trans	=	Number of broker-hosted conference without transcripts attended by the firm during year t.
Confs-Trade	=	Number of trade shows attended by the firm during year t.
Confs-IR	=	Number of conference sponsored by neither brokerages nor trade associations attended by the firm during year t.
Errors	=	Average absolute analyst forecast errors for the firm during year t. Analyst forecast error is the latest forecast for each analyst before the earnings announcement minus the actual earnings, scaled by stock price at the end of fiscal year. Forecasts, earnings and stock price are adjusted for stock splits.
Errors-No Hosts	=	Similar to Errors, except the analysts affiliated with the hosts whose conferences the firm attends during year t are excluded before the average is calculated.
Size	=	Logarithm of market value of equity at the end of fiscal year t. ($\log(\text{PRCC}_F * \text{CSHO})$).
Analyst	=	Number of analysts who issue at least a forecast during year t.
Institution	=	Percentage of institutional ownership at the end of the calendar quarter closest to year t fiscal year end.
Loss	=	Indicator variable equal to 1 if income before extraordinary items (IB) is less than zero, and 0 otherwise.
Growth	=	Sales growth calculated as follows: $(1 + \text{Growth})^n = \text{Sale}_t / \text{Sale}_{t-n}$, n being 1 to 5 depending on the length of the time series.
R&D	=	R&D expense (XRD) scaled by sales. It is set to zero when missing.
Ret Volatility	=	Standard deviation of the previous 48 months of stock returns.
Earn Volatility	=	Standard deviation of the previous 16 quarterly earnings.
Irisk	=	Idiosyncratic risk measured as average monthly variance of excess returns from the Fama and French three-factor model. Each month the following regression is run using daily returns: $R_{i,t} - R_{f,t} = \alpha + \beta_{i,m}(R_{m,t} - R_{f,t}) + \beta_{i,smb}SMB_t + \beta_{i,hml}HML_t + \epsilon_{i,t}$. Monthly variance equals $\text{Var}(\epsilon_{i,t}) \times$ the number of trading days in month t. For each year, the idiosyncratic risk is the average of 12 monthly variances.

Invsynch	= Inverse synchronicity measured as $\log((1-R^2)/R^2)$, R^2 is the average of 12 monthly R^2 s during each year, and R^2 is from the regression described above.
DD	= Accrual quality by Dechow and Dichev (2002) augmented by Francis et al. (2005) and McNichols (2002). For each of Fama and French (1997)'s 49 industry groups every year, the following regression is run: $TCA_{it} = \phi_0 + \phi_1 CFO_{it-1} + \phi_2 CFO_{it} + \phi_3 CFO_{it+1} + \phi_4 \Delta REV_{it} + \phi_5 PPE_{it} + \varepsilon_{it}$. The inverse earnings quality is measured as the standard deviation of the residuals over year t-4 to year t, $\sigma(\varepsilon_{it-4,t})$. TCA is total current accruals, Δ Current Assets- Δ Current Liabilities- Δ Cash+ Δ Short-term Debt (Δ ACT- Δ LCT- Δ CHE+ Δ DLC). CFO is the net income before extraordinary items minus total current accruals plus depreciation and amortization expense. (IB-TCA+DP). Δ REV is change in sales (Δ SALE). PPE is the gross value of property, plant and equipment (PPEGT).
BM	= Book value of equity to market value of equity at the end of fiscal year (CEQ/(PRCC_F*CSHO)).
Lev	= Short-term and long-term debt to total assets at the end of fiscal year ((DLC+DLTT)/AT).
CFO	= Cash flow from operating activities scaled by total assets (OANCF/AT).
VCFO	= Standard deviation of CFO from year t-4 to t.
Frev ²	= Squared forecast revision. Forecast revision is defined as the first two-year-ahead median consensus forecast three months after fiscal year t-2's end minus the first one-year-ahead median consensus forecast three months after fiscal year t-1's end.
Ret _t	= Buy-and-hold returns during year t.
Ret _{t+1,t+3}	= Future buy-and-hold returns from year t+1 to year t+3.
Earn _t	= Net income before extraordinary items (IB) scaled by market value of equity at the end of year t-1.
Earn _{t+1,t+3}	= Sum of net income before extraordinary items (IB) from year t+1 to year t+3 scaled by market value of equity at the end of year t-1.
Call	= Indicator variable equal to 1 if the firm holds at least one earnings call during year t, and 0 otherwise.
MForecast	= Indicator variable equal to 1 if the firm makes at least one management forecast during year t, and 0 otherwise.
AR ₀	= Excess daily return on the presentation date from Carhart (1997) four-factor model. The estimation period is [-286, -31], with 0 being the presentation date. At least 30 observations are required for estimating the model.
AR _{1,t}	= Cumulative excess daily return over [1,t], with 0 being the presentation date and t being either 5 or 10.
Trade	= Indicator variable equal to 1 if the conference presentation is at a trade show, and 0 otherwise.

Size (price reversals)	=	Logarithm of market value of equity on the day before the presentation date.
BM (price reversals)	=	Book value of equity to market value of equity on the day before the presentation date.
MOM	=	Buy-and-hold returns over the 12 months before the presentation.
Volume	=	Trading volume scaled by total shares outstanding on the presentation date.
