Understanding Precautionary Cash at Home and Abroad

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Abstract

In the presence of market frictions, it is optimal for firms to stockpile cash to fund investment projects which may arise in the future. Prior work has documented that firm’s precautionary savings motives predict variation in the size of firm’s cash stockpile. The dramatic run up in cash stockpiles raises the question of why these precautionary motives have become stronger. In the presence of repatriation taxes, foreign and domestic cash are imperfect substitutes. We show that although precautionary motives explain variation in the level of cash held domestically, they provide little explanatory power for the level of foreign cash. Multinational firm’s foreign cash balances are instead explained by low foreign tax rates and the ability to transfer profits within the firm through related party sales. The firms with the greatest incentive and ability to transfer income to low tax jurisdictions do, and this results in stockpiles of cash trapped in foreign subsidiaries.

Note: The statistical analysis of firm-level data on U.S. multinational companies was conducted at the Bureau of Economic Analysis, U.S. Department of Commerce, under arrangements that maintain legal confidentiality requirements. The views expressed in the paper are those of the authors and do not reflect official positions of the U.S. Department of Commerce.
According to recent Flow of Funds estimates, US non-financial corporations are sitting on an aggregate cash and marketable securities position in excess of $3 trillion. This staggering amount has led to policy makers and commentators expressing concern as to why firms are building such large stockpiles despite an economy in recovery and a low interest rate environment which should induce greater investment.

The academic literature has largely focused on the precautionary motive for retaining cash. Due to information asymmetries that may exist in the capital markets at the same time that firms are in particular need of funds, incentives exist to build cash stockpiles that reduce firm dependency on external capital. This need for precautionary cash increases with uncertain investment needs (Martin and Santomero, 1997; Boyle and Guthrie, 2003). As the large run-up in cash is concentrated in arguably the least constrained firms (large, profitable firms with rated debt), prominent papers such as Bates, Kahle, and Stulz (2009) have focused more on the role of increasing investment uncertainty to explain this phenomenon. It is not clear, however, whether all cash is held for precautionary reasons. Where the cash is held can tell us a great deal about its purpose. Many firms’ cash holdings are in risky and potentially illiquid securities (Duchin et al, 2015). Investing excess cash in risky and illiquid securities are not the obvious way to guarantee the firm has capital for valuable future investment opportunities or to minimize expected distress costs. Further, many firms hold vast sums of cash overseas to defer the taxation of foreign earnings (Foley et al, 2006). Given the tax consequences of repatriating overseas cash, it is not clear that foreign cash is a perfect substitute for domestically held precautionary cash – particularly when invested in illiquid securities.

The challenge in the literature has been to differentiate between the cash held for precautionary reasons versus the cash held for tax reasons. Are firms really stockpiling $3 trillion
because they anticipate needing that much for investment purposes but fear rationing? How much is instead being held due to tax incentives? Does the money held for tax purposes also provide precautionary benefits? These are the questions we explore in this paper.

Some have argued that firms do differentiate between cash and marketable securities so that bifurcation could be used to test these different explanations. However, highly liquid risk-free marketable securities are nearly perfect substitutes for cash in fulfilling precautionary motives. Therefore, distinguishing on that dimension is not helpful in illuminating how these two motivations intersect with each other. Instead, our approach is to separate along the dimension of where the cash is held: domestic versus foreign. We argue that domestic cash has no tax benefits arising from deferral of the repatriation tax since corporate taxes (domestic and foreign) have already been paid on these funds. As detailed in Duchin et al (2015), when corporate income tax rates are lower than personal tax rates on financial income, there may be benefits from corporations deferring the payment of operating cash flows out to investors. Yet that behavior doesn’t correspond with holding cash domestically when the US has one of the highest corporate income taxes in the developed world. Thus the benefits of holding cash in the US are to provide operational liquidity and fund precautionary savings.

On the other hand, foreign cash is almost entirely subject to incremental taxation by the US. Equity infusions from the US parent into foreign subsidiaries do not generate tax implications if that capital is returned. However, any distribution of foreign earnings is subject to tax at the positive rate differential between the US tax rate and the foreign tax rate. The high US corporate tax rate means that almost all foreign operating income would generate incremental tax upon repatriation to the US (Graham, Hanlon, and Shevlin, 2015).
We do not know whether foreign cash also serves a precautionary savings role. On the one hand, this money is available in times of capital rationing. On the other hand, should those funds be needed domestically, the firm would need to pay the incremental tax resulting from the repatriation that would occur in order to invest those funds domestically. Note that while firms can structure a transaction avoiding repatriation tax if the proceeds are located in one non-US subsidiary and needed in another non-US subsidiary, should the funds return to the US, they will almost always be subject to tax. Depending upon the location of the funds (some foreign countries have no tax on corporate income making the repatriation tax rate 35%); firms may find that the incremental tax exceeds the positive NPV of the investment and they optimally forego the investment if only foreign funds are available. If this is the case, foreign cash serves as an imperfect substitute for domestic cash. They are substitutes for funding foreign investment but not domestic investment. This generates the empirical question of how important precautionary motives are in explaining foreign cash holdings.

This separation between domestic and foreign cash is not historically possible using publicly available data sources. Some firms have voluntarily disclosed their foreign cash position and for those with particularly large stockpiles, the IRS started in 2010 to require that firms separately report the amount held domestically and the amount held abroad (Harford et al 2015). Therefore, the literature has not so far separately estimated the determinants of domestic versus foreign cash positions. The Bureau of Economic Analysis (BEA) conducts a mandatory survey of U.S. multinational companies that generates the data that is needed to address this shortcoming.\footnote{The company-level data from this survey, which by law are confidential, are collected for the purpose of producing publicly available aggregate statistics on the operations of multinational companies.} From this survey, we are able to measure how much cash and marketable securities firms are holding in each foreign subsidiary. Combining this with the disclosure of
their total cash and marketable securities position and we are able to calculate how much cash is held domestically.

We proceed by first regressing the total cash position of the firm on variables that have previously been documented to explain some of the observed cross-sectional variation in corporate cash positions (Opler et al., 1999, Bates et al., 2009). After showing that the baseline specifications are similar to what has been found in the prior literature, we replicate these specifications separately for the cash held domestically and the cash held abroad. The results are striking. The aggregate cash position is explained by a variety of firm characteristics associated with precautionary motives, such as growth opportunities and leverage. It also is inversely related to the Faulkender and Smith (2015) effective tax rate (an average of the US and foreign tax rates which firms face given the location of their foreign operations). Firms with higher average tax rates hold less cash.

Breaking out the domestic and foreign cash positions separately provides additional insight. For multinationals, the effective tax rate does not explain domestic cash levels. However, for foreign cash holdings, the estimated coefficient is highly negative, both economically and statistically. This implies that firms with lower effective tax rates hold more foreign cash, consistent with the Foley et al (2006) argument that if firms are confronting lower tax rates abroad, their repatriation tax is higher, and this incentivizes the stockpiling of foreign cash. A firm’s strategic choice to reduce its effective tax rate is something we will discuss below but this divergence between drivers of foreign and domestic cash is consistent with firms moving cash abroad when there is less need for precautionary cash. Importantly, proxies for precautionary motives are not relevant for explaining foreign cash.
To fully understand these results, we examine a variety of alternative specifications. Extending the evidence on precautionary cash, we add to the specifications a variety of substitute proxies that have been used elsewhere. Following Faulkender and Petersen (2012), we employ the percentage of recent years when worldwide investment has exceeded total income, indicative of the types of firms that may have unfunded investment opportunities. We employ risk measures, such as industry cash flow volatility (Bates, Kahle, and Stulz, 2009) and product market fluidity (Hoberg, Phillips, and Prabhala, 2014) to better understand how product market uncertainty impacts cash holdings. The variables are only useful in explaining variation in domestic cash.

After isolating the precautionary motives for holding cash, we are able to delve further into the tax motives. Often, overseas cash held by US firms is referred to as trapped. Yet there is broad evidence that intellectual property royalty and transfer payments facilitate the offshoring of income to low tax jurisdictions (Grubert, and Mutti, 1991, Levin and McCain, 2013, Kanter, 2014). Firms with intellectual property, whether it consists of patents, trademarks and licensing deals, may be able to adjust the ownership and within firm pricing of that the IP to transfer revenues from higher taxed regions to affiliates in low tax havens. This transfer pricing is a deliberate relocation of cash to affiliates and we explore whether these within firm transfers indeed contribute to the observed cash positions. Specifically, we calculate how much the revenue of the firm’s subsidiaries is generated by sales to other subsidiaries. Under the hypothesis that firms structure the location of their intellectual capital to take advantage of low corporate income tax rates in some foreign jurisdictions, we expect firms with subsidiaries in low tax jurisdictions to do more internal sales. This enables them to move money to lower tax countries, but also results in larger cash and marketable securities portfolios held abroad. That is
exactly what we find. Further examination reveals that this result is entirely explained by firms engaged in significant R&D. The result does not hold for firms which are not engaged in R&D. Firms with intellectual property are most able to control their effective tax rate using within firm transfers.

The rest of this paper is organized as follows. Section 1 describes our data and empirical strategy. Section 2 presents our results while the channel of affiliated sales and transfer pricing is explored in Section 3. The final section concludes.

I. Empirical Strategy and Data

A. Empirical Design.

Our objective is to better understand the increases in firms’ liquidity positions that have been observed recently. In particular, how much of the significant cash positions of firms is explained by concerns about the accessibility of external capital (precautionary savings) relative to the portion that is arising from international tax considerations. To distinguish between these factors, we estimate the factors which explain a firm’s level of domestic and foreign cash, and thus can test whether the motivations that drive firms to stockpile cash are the same for domestic and foreign cash.

Our approach is to first establish a baseline regression specification that draws from many of the factors that have been previously identified to explain cash holdings. We estimate the total cash holdings of firms (as a percentage of their book assets) as a function of standard determinants of cash similar to Bates, Kahle, and Stulz (2009). Specifically, we control for firm size (as measured by the natural log of sales), whether the firm has a bond rating, asset tangibility (the PP&E to book assets ratio), profitability (return on assets), R&D to sales,
advertising to sales, market-to-book, book leverage, and capital expenditure to assets. After reconciling our estimates with those that have been previously documented for total cash, we move to separately estimating this specification for the cash that is held in the US and for the cash that is held abroad. The domestic cash specification is estimated both for all firms and just for those that have international operations.

Since precautionary savings is motivated by concerns about financial constraints, our examination then moves to additional factors that have been previously employed to differentiate the extent to which firms may be currently financial constrained or concerned about becoming constrained in the future. Following Faulkender and Petersen (2012), we measure the likelihood that firms’ internally generated cash may have been insufficient to fully fund their investment opportunities. Specifically, we take the percentage of the previous three years in which their capital expenditures exceeded their operating cash flow. The higher this percentage, the more likely it is that firms have investment opportunities that have been foregone. Arguably firms with sufficient operating cash flow to fund investment should not be capital constrained. Anticipating such investment needs, these firms are more likely to build precautionary savings reserves when capital markets are accessible.

We follow the recent literature and include two distinct measures of risk in our precautionary savings specifications. Following Bates et al, we include the industry cash flow risk. For each two digit SIC group, we average of the firm cash flow standard deviations, which is calculated based on a ten year moving average of the standard deviation of cash flow to assets. This measure captures historical evidence of cash flow volatility. We also include a forward looking measure of risk which affects the need for precautionary cash. We capture changing product market threats using the product market fluidity measure from Hoberg, Phillips, and
Prabhala (2014), which is found to affect cash balances. This variable is calculated by Gerry Hoberg and available on his website.

Moving to the tax motivations of cash holdings, we follow Faulkender and Smith (2015) and use an international blended tax rate. The measure is a weighted average statutory tax rate using the percentage of EBIT (earnings before interest and taxes) generated in each affiliate in the corresponding fiscal year with the tax rate in the tax jurisdiction of that affiliate. So if 50% of the total operating income in 2006 were generated in the United States, 30% in the foreign affiliate which is located in Ireland, and the remaining 20% in the affiliate which is located in Germany, we would estimate tax rate confronting the firm in 2006 as:

$$
\tau_{\text{Firm,2006}} = 50\% \tau_{\text{US,2006}} + 30\% \tau_{\text{Ireland,2006}} + 20\% \tau_{\text{Germany,2006}}
$$

This blended tax rate represents our estimate of the tax rate confronting firms prior to using interest expense to shield such income from taxation. As this weighted average rate increases, we would expect the firm to hold less cash because they realize lower deferral benefits. Stated differently, it is the firms that generate the greatest amount of earnings in low tax jurisdictions that would most benefit from deferring repatriation and stockpiling the foreign earnings in cash and marketable securities. Finding a negative relationship between the firm’s worldwide average tax rate and its cash holdings would provide evidence consistent with this hypothesis (e.g., Foley et al, 2006).

The next question is to determine which kinds of firms are best able to manager their operations in a way that mitigates taxes and thus results in trapped cash. Anecdotally, there is evidence that the effect is particularly pronounced in firms with high intellectual property and that are able to utilize transfer pricing and royalty payments to move earnings from high tax jurisdictions to low tax ones. We would therefore expect that the firms that have significant
sales from one subsidiary to another, relative to external sales, are those most able to engage in this type of international tax planning. We construct a measure equal to the percentage of the firm’s total revenue accounted for by sales of its foreign subsidiaries to either the parent company or to related subsidiaries. We hypothesize that the tax effect should be greatest among those firms that are particularly adept at using affiliated sales to move income across various tax jurisdictions.

B. Data Sources.

The challenge associated with engaging in any of these analyses is the lack of publicly available data regarding the international operations of firms. The information disclosed in firm’s 10-Ks is entirely too course to understand where firms are operating, the tax jurisdiction to which they are subject, and the amount of cash and marketable securities they hold in these various locations. Fortunately, the Bureau of Economic Analysis (BEA) conducts an annual survey that US multinationals that contains numerous balance sheet and income statement items for each foreign affiliate of a US-based multinational firm. The US multinationals are required by law to complete the survey. We use the BEA multinational affiliate data to measure the portion of a firm’s total cash which is held domestically or in one of its international affiliates.

Specifically we employ data from the BEA’s benchmark (BE-10) and annual surveys (BE-11) of U.S. multinational companies, which include information on the assets and profitability of the foreign affiliates of multinational firms.² Because we are interested in the cash allocations of firms as well as variation in the foreign tax rates multinational firms confront, our firm-year observations are limited to the years during which the necessary data was gathered.

² The benchmark (BE-10) survey, conducted every five years (1994, 1999, 2004, and 2009), is more comprehensive for some of the accounting data of the smaller foreign subsidiaries than the annual (BE-11) survey, which is conducted in interim years. The BEA estimates these accounting items for the intervening four years between the comprehensive surveys. Our results are robust to confining our analysis to only the years in which the more comprehensive survey is conducted.
This data is available from 1999 to 2009. Using this data, we are able to measure the amount of cash and estimate the marketable securities held in their foreign subsidiaries. The annual survey explicitly includes the amount of cash in each foreign subsidiary as well as inventory and “other current assets”. To estimate the marketable securities contained in other assets, we subtract out an estimate of the subsidiaries accounts receivable by assuming the accounts receivable to sales ratio is the same across the firm. Our estimate of the cash and marketable securities is thus:

\[
\text{Cash} + \left[ \text{Other current assets} - \left( \frac{\text{Accounts Receivable}_{\text{firm}}}{\text{Sales}_{\text{firm}}} \right) \frac{\text{Sales}_{\text{Subsidiary}}}{\text{Sales}_{\text{firm}}} \right]
\]

This approach assumes the rest of other assets is marketable securities as a first pass. The difference between the total cash position of the firm and the sum of the cash in its foreign affiliates is our estimate of the domestic cash position of firms each year. We replicate our results using only cash, opposed to our estimate of cash and marketable securities from equation (2), and the results are essentially the same. These results are available in the online appendix.

We also use this data to construct our estimate of the average worldwide tax rate confronting these firms (equation 1). Following Faulkender and Smith (2015), we use tax code information for foreign jurisdictions provided by Comtax for the years 2006 to 2009. For the period 1995 to 2005, we utilize data from the KPMG Corporate and Indirect Tax Survey. For all other control variables, we use the COMPUSTAT data that is provided by Standard and Poor’s based upon annual 10-K filings. Control variables include: firm size (the natural logarithm of sales), profitability (EBIT over book assets), asset tangibility (the ratio of PP&E to book assets), growth opportunities (measured by the ratio of R&D to sales, advertising to sales, the market-to-book ratio, the depreciation to assets ratio in order to capture depreciation tax shields, and whether the firm has a bond rating any month during the fiscal year. All of these measures are winsorized at the 1st and 99th percentiles.
C. Summary Statistics: Location and Magnitude of Cash Holdings.

Firms are holding significant cash positions in their foreign subsidiaries. The average firm holds more domestic cash than foreign cash (see Table 1 – Full Sample). Since this sample includes firms with foreign operations it does not focus on the firm which have the flexibility to store cash domestically or abroad. When we examine multinational firms, the amount of cash held abroad is still less than the level of domestic cash but is a much larger fraction of their total cash holdings (approximately a third). Both levels are significant percentages of the firm’s assets. Another notable difference is that firms with foreign operations are significantly larger, more profitable, and have lower market-to-book ratios compared to solely domestic firms.

One way to examine the differences between domestic and multinational firms is to examine statistics from industries that are primarily domestic relative to those with significant overseas earnings. In Table 2, we divide firms based on the portion of profits which are derived from domestic sources, tabulating the five industries that have the highest percentage of their earnings coming from abroad and the five industries with earnings most concentrated in the United States (conditional on having foreign operations). We then examine the allocation of cash between domestic and foreign accounts for those with significant foreign operations and those that are almost entirely domestic. As can be seen by the summary statistics, the industries with most of the earnings generated domestically have higher tax rates and lower foreign cash as well as lower overall cash levels. The firms in industries with predominantly foreign income (the top five industries earn more than half of their income outside of the US), face lower tax rates. These firms also hold significant cash balances in their foreign subsidiaries in relative to their

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3 We excluded firms with only domestic operations when constructing Table 2, so that we could examine firms with foreign operations and thus which have the option of stockpiling cash domestically or in a foreign subsidiary.
assets and relative to their domestic cash position. These univariate results foreshadow the findings documented using more rigorous econometric analyses that follow.

II. Determinants of Cash Holdings and Location

A. Precautionary Motives.

Our first set of regressions examines the total cash and marketable securities of the firms in our sample as a function of firm characteristics that have previously been shown to explain the cash position of firms. As we examine the determinants of firm’s cash holdings, we will examine variation across firms with and without foreign operations, and among the firms with foreign operations, we can examine the determinants of their domestic and foreign cash holdings. Consistent with prior work, we find evidence of a precautionary motive for stockpiling cash when we look at the total cash firm’s hold independent of where they hold it. The results are broadly consistent if we examine all firms (see Table 3 – column I) or only multinational firms (firms with foreign profits, see Table 3 – column II). Firms that are larger, have greater asset tangibility (PPE/book assets), pay dividends, conduct less R&D, and that have lower market-to-book ratios and higher leverage ratios all hold less cash. Traditionally, these results have been interpreted as consistent with the precautionary savings motivation as these characteristics are associated with firms that are less likely to be capital rationed and would therefore derive less benefit from stockpiling cash. These patterns hold for both the full sample as well as the subsample of multinational firms, and the coefficients are broadly of the same magnitude. In addition, the coefficient on our estimated tax rate variable is negative and statistically significant, consistent with Foley et al (2006), implying that those firms confronting lower average tax rates hold more (trapped) cash. Remember that variation in our estimated tax rate comes entirely from
the portion of the firm’s earnings that are realized overseas and the tax rate in the countries in which those earnings are generated.

Given the results during our sample period are consistent with the previous literature, we can now examine whether the determinants of cash holdings are the same the cash and marketable securities held domestically relative to those held abroad. In the remaining columns of Table 3, we run the regression for domestic and foreign cash separately. The first thing to note is that many of the variables which are related to precautionary motives are relevant only for explaining the domestic cash held by multinationals. The precautionary savings motivations are a significant determinant of the observed variation in the domestic cash and marketable securities positions of firms whether we look at all firms (Table 3, column III) or only multinational firms (column IV). Specifically, firms that engage in significant R&D and have high market-to-book ratios hold larger domestic cash positions. These results are consistent with the types of firms engaging in intangible investment, and who therefore may be most likely to be rationed, holding more domestic cash to mitigate potential underinvestment that may result from such rationing. Firms that are larger, with more tangible assets, have access to public debt markets, that pay dividends, and have more debt in their capital structure – the types of firms previously argued to be least likely to face external capital constraints – hold less domestic cash as well.⁴

Interestingly, these precautionary savings motivations do not explain variation in foreign cash holdings. We see that many of the firm characteristics that explained domestic cash (column IV) and are often interpreted as associated with precautionary savings motivations have little predictive power in explaining a firm’s foreign cash positions (Table 3 – Column V). It is still the case that firms with more tangible assets hold less cash but now our growth proxies, the R&D

⁴ If we do not include the firm’s leverage, these results are even stronger (the coefficients are larger in magnitude). Results are available from the authors.
to sales ratio and the market-to-book ratio and whether a firm pays a dividend have estimated coefficients that are appreciably smaller economically and no longer statistically different from zero (even though the standard errors have increased with the smaller sample size). For example, the R&D coefficient has decreased in absolute terms by an order of magnitude and flipped signs. In addition, variables explaining capital rationing like whether the firm pays dividends and its leverage ratio have shrunk in magnitude and are no longer statistically significant. Precautionary motives are an important determinant of a firm’s domestic cash holdings (whether they are a MNF or not), but not of a firm’s foreign cash holdings.

**B. Tax Rate Effects.**

When we examined firm’s total cash holdings we found that the tax rate was negatively correlated with firm’s cash holdings. Firms with higher tax rates hold less cash. When we examine domestic and foreign cash we find very different results. Higher tax rates are associated with slightly higher, not lower, domestic cash levels whether we examine the entire sample (column III) or only multinationals (column IV). The coefficient switches signs, drops appreciably in magnitude and is no longer statistically different from zero.\(^5\) The effect of taxes which we found for total cash is driven by the foreign cash holding of MNFs. MNFs with lower effective tax rates hold more cash abroad as is expected given the cross-sectional variation in the cost of repatriation foreign earnings. The magnitude of the coefficient has risen by a factor of three. These results indicate that firms do not consider foreign cash and domestic cash as perfect substitutes. The motivations that drive each are distinct. Thus the literature should not interpret

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\(^5\) In the total sample regressions we also include a dummy variable which is equal to one if the firm is domestic (has no foreign operations) and zero otherwise. The coefficient in column III is 0.105, meaning domestic firms have cash holdings which are 10.5% of book assets greater than foreign firms. MNFs have less cash, all else being equal, held domestically, and have more cash held abroad (by construction). MNF’s total cash, controlling for firm characteristics, is slightly smaller than domestic firms (\(\beta=-0.015\), Table 3 – column I). This is inconsistent with the summary in the summary statistics of Pinkowitz, Stulz, and Williamson (2015) which suggest MNF hold more cash.
the entire aggregate cash balance of non-financial firms as money stockpiled to fund valuable investment that capital market frictions would otherwise cause to be foregone.

C. Capital Constraints.

To the extent that the precautionary savings motivation explains cash holdings, these findings should be particularly acute for the firms most likely to confront capital constraints. Thus, we reexamine our results adding in the Faulkender and Petersen (2012) measure of capital constraints that captures whether firms investment expenditures exceed their internally generated funds. Recognize that if firms’ operations are sufficient to fund all of their investment opportunities, than they need not rely on external capital or an internal stockpile. However, for those firms with investment expenditures in excess of their internally generated funds, they are likely to stockpile cash when capital markets are accessible and then hold this cash and marketable securities should they need it to fund investment in the future. We add this variable to our baseline specification and examine the results for domestic versus foreign cash in Table 4.

As expected, firms more likely to be capital constrained hold higher domestic cash levels. The estimated coefficient suggests that the cash to assets ratio is eleven to fourteen percentage points higher (full sample results in column 2 and just multinationals in column 3) for those firms which invested more in each of the last three years than their realized operating cash flow in those corresponding years relative to a firm whose investment never exceeded their internally generated cash flow. However, this firm characteristic has no effect on the foreign cash position of firms. In column 4, the coefficient on Years Constrained (%) is essentially zero and statistically insignificant. These results again suggest that the precautionary savings motivation has strong explanatory power in explaining domestic cash but seems to play little to no role in explaining the variation in foreign cash positions.
D. Measures of Risk.

Precautionary savings are more valuable to firms whose cash flows are more risky. Should firms operations be negatively shocked, not only will their internal capital generating capacity be impaired, this would likely coincide with facing larger costs of external funds. If firms need cash, either to overcome a temporary shock to their operations or to fund valuable investment that will allow them to adapt to the shock, then having a large cash stockpile is more valuable.

In Table 5, we examine two different measures of risk – industry cash flow volatility and product market fluidity – and again estimate how these measures correlate with domestic versus foreign cash positions. Following Bates et al, we incorporate the standard deviation of the firm’s cash flow, measured over the previous five fiscal years, into our cash regression. Higher cash flow risk is positively associated with the firm’s domestic cash position (Table 5, column I) and, has a smaller effect, yet positive and statistically significant effect on multinational firm’s foreign cash (column II). We examine the product market fluidity of the firm as a more forward looking measure of investment uncertainty in columns III and IV. This variable measures the competitive product market threat to the firm and has been documented by Hoberg, Phillips, and Prabala to affect cash holdings. Product market fluidity risk is positively associated with the domestic cash position of firms, consistent with the precautionary motivation. However, its estimated association with foreign cash is negative and the coefficient is 50 percent smaller, indicating that greater product market competition is correlated with lower foreign cash holdings. Since the sum of the coefficients is positive, firms which face more product market fluidity risk do hold more total cash, but more than 100 percent of the increase is held domestically. Holding
the cash domestically gives the firms the greatest flexibility in deploying the capital. Firms more secure in their product market are the ones able to stockpile cash abroad.

Overall, these results confirm that domestic cash and foreign cash are not substitutes for each other. Given the potentially significant tax costs firms would face upon repatriating that cash, characteristics that have been previously documented to explain firm’s cash positions that are related to precautionary savings motivations only explain the domestic cash portion. Firms foreign stockpiles appear to be minimally (if at all) related to precautionary explanations. Thus, the literature needs to be careful about assigning explanation to the aggregate cash position of non-financial firms as arising from expected operating or investing needs that would otherwise be rationed due to capital market frictions. That explanation appears to only apply to the domestic portion of the firms cash.

IV. Transfer Pricing and Affiliated Sales

If the precautionary savings motivation, which has long been the dominant explanation for non-financial firms to stockpile cash, does not explain the significant run-up in the foreign cash position of firms, than what does? Foley et al (2007) argue that the US tax code is a significant factor. Looking at the total cash position of firms, they identify that the higher the difference between the US tax rate and the tax rate the firm confronts abroad, the larger is the increase in the firm’s cash position. The baseline regression in Table 3 confirms this result. The lower the effective tax rate of the firm, the higher is its total cash position however the higher level of total cash is explained entirely by a higher level of foreign cash. Domestic cash holdings do not rise as the foreign tax rate falls below the US tax rate.

The following question continually arises: if firms are able to lower their corporate income tax by wholly owning a foreign subsidiary in a low tax jurisdiction and generating their
earnings for tax purposes with that subsidiary, why don’t all firms do so? Why aren’t all (multinational) firms sitting on large foreign cash positions? We contribute to the examination of this question by estimating the sources of variation in the foreign cash position of firms. Those that are able to generate larger foreign cash stockpiles, particularly in low tax jurisdictions, are the ones that have a comparative advantage at reducing their tax obligations.

Transfer pricing may be an important element in the movement of earnings to low tax jurisdiction subsidiaries. Starbucks, for example, was investigated by European Commission regulators for whether “Dutch authorities allowed Starbucks to use unfair methods to shrink its taxable income, including paying a royalty to a partnership in Britain, Alki, for a recipe for coffee-roasting” (Kanter, 2014). Underpinning transfer pricing is the nature of the intellectual property of the firm. Not only is it easier to transfer intellectual property to low tax jurisdictions than to transfer physical capital, it is easier to avoid charges of tax avoidance with more difficulty to value items such as patents and technology (Grubert, 2003). Thus firms with more unique assets would be more successful at lowering their effective tax rates that result in larger foreign cash stockpiles.

To identify transfer pricing opportunities within a firm we examine the portion of a firm’s sales that they deem “related” or “affiliated”. On the annual survey, firms note the portion of a subsidiary’s revenue arising from sales to the other subsidiaries of the firm or to its parent. We sum the sales across all foreign subsidiaries of the firms and express this amount as a percentage of the firm’s total revenue. We hypothesize that if transfer pricing is the mechanism that facilitates the movement of earnings to low tax jurisdictions, then the firms that have high levels of affiliated sales and low effective tax rates are the ones that will end up with the most trapped cash abroad. The analysis is presented in Table 6.
Looking at the firm’s total cash position, we find results consistent with our hypothesis. Not only do firms confronting lower effective tax rates have higher cash positions, but firms with more related party sales also have higher cash balances, although this second effect is small and not statistically significant. The coefficient on the cross product of related party sales and the effective tax rate is positive and again not statistically different from zero. This pattern holds for both the full sample as well as the subsample of multinationals (Table 6 - columns I and II). Neither the effective tax rate nor related party sales are useful in predicting domestic cash holding (Table 6 – columns III and IV).

The roll of foreign tax rates and related party sales is only apparent when we examine firm’s foreign cash holdings. The foreign cash component arises mainly from firms in low tax rate foreign jurisdictions that are doing significant related party sales. The coefficient on the effective tax rate is negative; the coefficient on related party sales is positive and both are statistically different from zero. (Table 6 – column V). The coefficient on the cross product (tax rate times related sales) is negative (but not statistically different from zero). While low tax rates themselves are important in explaining large foreign cash positions, this effect is enhanced by low tax-rate firms’ abilities to move revenue across the firm. A firm’s tax rate isn’t low everywhere, only in some (or all) of its foreign subsidiaries. Thus firms who have greater ability to move income to low tax jurisdictions (through related party sales) have the greatest opportunity to lower their taxes and also are the ones with the greatest cash balances.

However, these results do not sufficiently explain why all firms are not engaging in such related party sales and using this mechanism to thereby lower their corporate income tax liability. There must be some restriction on firm’s ability to place subsidiaries in low tax jurisdictions and/or use related party sales lower taxes. One common thread in much of the
anecdotal evidence about transfer pricing is that intangible assets are relatively easier to reallocate to low tax jurisdiction countries than economic value add arising from outcomes of physical capital (manufacturing, mining, timber, etc.). To further explore this channel, we divide the sample into those firms engaged in significant intellectual property development, as measured by disclosing material (non-zero and non-missing) amounts of R&D spending relative to those firms that either spend zero on R&D or whose spending is insufficient to merit reporting (see Table 6 – columns VI and VII).

The dual role of low foreign tax rates and the use of related party sales does not affect foreign cash holdings of firms without significant R&D expenditure. Among these firms, lower tax rates do lead to higher foreign cash balances, but related sales have no effect (the coefficient is negative but not statistically different from zero). The effect we documented for foreign firms (Table 6 – column VII) appears only among firms with R&D expenditures. It is only the firms engaging in significant R&D for whom higher related party sales increase their foreign cash position. For these firms, not only does a lower effective tax rate increase their cash balances, but the magnitude of this effect is increasing in their related party sales. The coefficient on the cross product is negative, economically large and statistically significant. These results confirm many of the anecdotal, but undocumented, accounts that intellectual property development facilitates using transfer pricing to move earnings from high tax jurisdictions to low tax jurisdictions, resulting in significant amounts of trapped cash. Complementing Pinkowitz, Stulz, and Williamson (2015), we present evidence that non-R&D firms and R&D firms are not comparable to each other in ways that allow for inferences regarding cash to be made by using one group as a control group for the other. These results also suggest that policy proposals to address the offshoring of earnings and the resulting cash stockpiles that are created should target R&D firms
engaging in transfer pricing, without necessarily overhauling the entire tax code. Since the results are more acute for this subsample, policy proposals targeting such industries and activities may prove more effective at curbing some of these activities.

The way we measure the effective tax rate it depends both upon the foreign tax rates (how much lower are they than the US rate) and how much of the firm’s income (EBIT) is earned in the foreign jurisdictions. We bifurcate the effective tax rate variable into the portion arising from the percent of the firm’s earnings generated overseas versus variation in tax rates on overseas earnings in Table 7. Irrespective of whether we examine the total cash position, just the domestic component, or just the foreign component, as the foreign tax rate rises, firms hold significantly less cash. The effect on foreign cash is 3.5 times larger than the effect on domestic cash. Holding the foreign tax rate constant, increasing the fraction of income earned in the US increases the cash held in the US and decreases the cash held in foreign subsidiaries. Since the effect on foreign cash is much larger, total cash holdings also decline the more income that is earned in the US.

The fraction of income earned in the US also affects the firm’s cash holdings. The higher the percent of income earned in the US, the higher the domestic (US) cash holdings; the higher the percent of income earned in foreign jurisdictions (the lower the percent earned in the US), the higher the foreign cash holdings (Table 7 – columns II and III). This is consistent with the notion that cash is held where it is earned. However, the coefficient in the foreign cash regression is five times larger (-0.274 versus 0.056). Thus the firm store more of the cash they earn abroad, and this effect is stronger the greater the tax rate differential (foreign versus domestic).

V. Conclusion
US firms have significantly increased the amount of cash on their balance sheets and theory suggests why this can be value increasing. In the absence of market frictions, firms will pay out excess cash flow and then raise capital in the future when and if they need it. In the presence of market frictions, outside equity and debt capital may be too expensive or unavailable. In this environment, firms can create value by stock piling cash and using it in the future when capital is unavailable or too expensive. Prior empirical work has focused on and documented that precautionary motives can explain a significant portion of the variability in firm’s cash balances.

The challenge with interpreting these results is not all cash is in one universally accessible account. Due to the structure of the US tax code, tax held in a US firm’s foreign subsidiaries is not readily accessible nor a perfect substitute for cash held in the US. The firm must pay an incremental tax to access cash held in foreign subsidiaries located in low tax jurisdiction. As a large fraction of the cash held by US corporations is held abroad, it is important to understand the unique motivations that drive the decision to hold cash domestically or in their foreign subsidiaries. The imperfect substitutability is not symmetric. Excess cash held in the parent, can fund foreign investments without paying an incremental cost; while cash held in the foreign subsidiary can only fund foreign investments without paying the tax cost.

Due to the imperfect substitutability of these different cash accounts, and the asymmetry in the substitutability, domestic cash serves as a more valuable form of precautionary savings than foreign cash. As our results demonstrate, such imperfect substitutability leads to significantly different factors explaining the observed variation in domestic relative to foreign cash. Many of the firm characteristics previously documented to explain corporate cash that are associated with precautionary motives only explain the observed variation in the domestic cash
component on corporate balance sheets. These characteristics do a relatively poor job explaining the variation in foreign cash balances.

Instead, the primary factors explaining the observed variation in foreign cash holdings appears to be tax considerations. Lower corporate tax rates, particularly lower foreign tax rates, are associated with higher foreign cash positions, consistent with low tax rate jurisdictions being associated with higher effective repatriation tax rates. Firms optimally respond by deferring repatriation, leading to higher cash and marketable securities balances during the deferral period. These results are particularly acute for R&D intensive firms engaging in significant affiliated sales. Overall, our results indicate that at least two important considerations are at work in explaining the rising level of corporate liquidity. Caution is therefore required when interpreting the policy implications of recently high levels of observed cash positions.
References


