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Cash-rich Acquirers Do Not Make Bad Acquisitions: New Evidence

Abstract

Cash-rich acquirers on average perform better than their cash-poor counterparts. This observation is driven by financially constrained acquirers and by the deals made between the 1990s and 2000s. It is robust to alternative measures of financial constraints, to both the short term and the long term, and to the different institutional setting such as the U.K. We conclude cash richness primarily reflects acquirer managers' private information of deal quality instead of agency costs. The precautionary motive can explain the positive cash holdings effect on acquirer performance.

Keywords: cash holdings; financial constraints; acquirer performance; mergers and acquisitions; financial slack.

JEL Classification: G34, G30

The value of cash holdings is a controversial issue for company shareholders. On the one hand, excessive cash holdings engender agency costs (Jensen, 1986; Stulz, 1990). On the other, cash holdings provide financially constrained companies with financial flexibility and hedging against risks. The latter induces companies to hold cash under the precautionary motive (Myers and Majluf, 1984; Keynes, 1936; Almeida, Campello, and Weisbach, 2004; Denis and Sibilkov, 2009). A heated field where cash has important value implications is mergers and acquisitions (M&A), which is probably not surprising in so far as M&A is arguably the largest and most visible types of corporate investments. Earlier literature predominantly finds that cash-rich companies make value-destroying acquisitions (Harford, 1999; Lang, Stulz, and Walkling, 1991). To our knowledge, no previous study has examined cash-rich acquirers' performance using a conceptual framework other than that of Jensen (1986) and Stulz (1990). In this paper, we revisit cash-rich acquirers' performance, introducing variation to the strength of the precautionary motive relative to the agency theory.[1] Bates, Kahle, and Stulz (2009) find that companies increase their cash holdings tremendously in the 1990s and even more in the 2000s. They postulate that a critical determinant of this phenomenon is companies' precautionary demand for cash. They further point out there is no consistent evidence showing that the agency theory contributes to the increase. McLean (2011) also finds the precautionary demand for cash increases over time, and consistent with this evidence, he finds firms save more out of the proceeds of share issuance in more recent years. These recent findings call for renewed studies aiming at providing a more comprehensive understanding of cash-rich acquirers' performance. Our paper fills in this gap.

A priori, a cash-richer acquirer's performance can be better or worse, conditional on the cash holdings being costly free cash or value-enhancing financial slack. The valuable-financial-slack argument builds on the precautionary motive for holding cash, which suggests cash holdings have a positive effect on acquirer performance. The costly-free-cash school of thoughts,

[1] Two other theories explaining cash holdings are the transaction motive (Baumol, 1952; Miller and Orr, 1966) and the tax motive (Foley, Hartzell, Titman, and Twite, 2007). We control these effects in our empirical tests.

on the other hand, builds on the agency theory of Jensen (1986) and Stulz (1990), which implies cash holdings relate to lower acquirer performance. The ultimate impact of cash holdings on acquirer performance is a net of these two opposite effects, ceteris paribus. Specifically, Jensen (1986) and Stulz (1990) postulate that self-interested managers tend to spend cash on those projects that harm shareholder's value. Therefore, the acquisitions made by cash-rich acquirers are most likely to be value-destroying. The notion of valuable financial slack originates from the study of Myers and Majluf (1984) who posit that financial slack allows firms to undertake valuable projects that otherwise they would bypass due to costly external financing. Several relatively recent studies demonstrate that financial slack in the form of cash holdings are particularly valuable when firms are financially constrained and therefore have difficulties accessing external finances at reasonable costs (Denis and Sibilkov, 2009; Faulkender and wang, 2006; Pinkowitz and Williamson, 2007). Denis and Sibilkov (2009) further find that the volume of value-enhancing investments increases with cash holdings. Almeida, Campello, and Weisbach (2004) formally analyze the precautionary motive of cash holdings, which goes back to Keynes (1936).[2] In their model, financially constrained firms hold cash out of current cash flows to fund a future project that is more valuable than the current one. Thus, higher cash holdings reflect the financially constrained firms' rational response to their anticipation of valuable growth opportunities in the future. These anticipated growth opportunities will manifest themselves through the superior performance of subsequent actual investments, such as acquisitions. To the extent stock market does not fully predict these actual investments, the stock market reacts to their announcements. Since higher cash holdings relate to better investments, cash-richer acquirers should have better performance (in section 2, we provide a more detailed discussion to explain this hypothesis).

To disentangle the precautionary motive from the agency theory, we use measures of financial constraints suggested in the previous literature. In the context of the precautionary

[2] Terminology is not unified in the previous literature (see Kim, Mauer, and Sherman, 1998, p336). In this paper, we adopt the definition of Almeida, Campello, and Weisbach (2004), as well as Han and Qiu (2007), which focuses on the trade-off between current and future projects.

motive, the discussion of financial constraints focus on the difficulties that firms face in funding anticipated growth opportunities through external financing at a reasonable cost, rather than on the limitations that prevent firms from undertaking the optimal investments. In this sense, firms are financially constrained relative to their anticipation of high growth opportunities and related hedging demand (Almeida et al., 2004; Han and Qiu, 2007), and cash holdings are perceived as valuable financial slack that counters the possible loss of opportunities. When a company is sufficiently financially constrained, the benefit of the precautionary motive should outweigh the agency costs (if any). In the context of the agency theory, both Jensen (1986) and Stulz (1990) point out that the managers of financially constrained firms have less cash at their discretion and they face more frequent scrutiny by the external capital markets, which contains agency costs.[3] Hence, to distinguish between the effects of the precautionary motive and that of the agency costs, we use two measures of financial constraints: (i) the Whited-Wu index (Whited and Wu, 2006) and (ii) bond rating. The Whited-Wu index captures a wide range of firm characteristics that determine the degree of financial constraints. We use bond ratings, motivated by several studies on how information asymmetry in the bond market affects a firm's access to finance (Almeida et al., 2004; Denis and Sibilkov, 2009; Duchin, 2010; Harford and Uysal, 2014; Jensen and Meckling, 1976; Myers, 1977; Opler et al., 1999; Whited, 1992).

We further address several issues in our empirical analysis. To measure an acquirers' cash richness, we use the excess cash holdings, which is the residual cash holdings estimated from a model in the spirit of Opler, Pinkowitz, Stulz, and Williamson (1999).[4] Excess cash holdings reflect the private information held by acquirer managers that the market does not have. Such private information can be related to the relative quality of a future project, internal growth opportunities or the agency costs. Moreover, we control for the probability of an acquisition in all our regressions estimating acquirer announcement returns, which is to guarantee the cash

[3] Measures of corporate governance cannot gauge the strength of the agency theory and the precautionary motive simultaneously. This is because strong governance reduces the agency costs but not necessarily enhances the precautionary motive.

[4] Our results are robust to alternative measures of excess cash holdings (Appendix A provides more details).

holdings effect on announcement performance is not due to differing market anticipation. Further, to ensure our results are not subject to the self-selection bias, we estimate a Heckman (1979) model (not tabulated) and find that our sample is not affected by the self-selection bias—the inverse mills ratio is insignificant in our regressions. Finally, we further demonstrate the robustness of our results using acquisitions announced in the United Kingdom (U.K.) during 1984–2012, showing the positive cash holdings effect is not just a United States (U.S.) phenomenon.

Our preliminary analysis reveals that cash-rich acquirers on average perform better at deal announcement than cash-poor ones during our entire sample period of 1984–2012. This result is driven by the deals announced in the 1990s and 2000s, and the positive cash holdings effect is particularly strong in the 2000s—nearly nine times as strong as that in the 1990s. Bates et al. (2009) and McLean (2011) contend that the precautionary motive of cash holdings is a salient phenomenon in the 1990s and the 2000s.[5] Our results in the context of M&A are consistent with their findings, showing that cash-rich acquirers do not necessarily make bad acquisitions.

In our main analysis, we further examine to what extent financial constraints matter for the effect of acquirers' cash-holdings on acquirer performance. We find that the positive acquirer cash-holdings effect is primarily from those acquirers that are more financially constrained. This evidence is present at the deal announcement and in the long term after deal completion. As mentioned above, when a company is more financially constrained, the strength of the precautionary motive increases while the agency costs decrease. Accordingly, there are two possible channels through which financial constraints alter the acquirers' cash-holdings effect, i.e., mitigating the effects of agency costs and strengthening the effects of the precautionary motive. In our extended analysis, we find some evidence for the negative cash-holdings effect on performance when acquirers have weak corporate governance. However such negative cash-

[5] For deals announced during1984–1993, a period contemporary to that of Harford (1999), we find a negative cash-holdings effect similar to what Harford (1999) finds.

holdings effect disappears with higher financial constraints. Also, for those acquirers having strong corporate governance, the cash-holdings effect is positive on average and becomes more pronounced in the presence of greater financially constraints. These extended results suggest both channels exist and explain the positive cash holding effects.

In this paper, we revisit and revise the evidence on cash-rich acquirers' performance. We find cash-rich acquirers do not always make bad acquisitions, different from the findings of the earlier studies (Harford, 1999; Lang, Stulz, and Walkling, 1991). The negative cash holdings effect observed in earlier studies are more consistent with the view of costly free cash, while the positive cash holdings effect due to the later subsample periods is more in line with the valuable financial slack argument. The evolvement of cash holdings effect is consistent with the secular trend of increasing precautionary demand for cash documented by Bates et al. (2009).[6] Importantly, the presence of financial constraints significantly enhances cash-rich acquirers' performance, which further emphasizes the relevance of the precautionary motive in determining cash-rich acquirers' performance.

Our results are also in line with Jensen's (1986) view that financial constraints mitigate agency concerns, as well as the view of Faulkender and Wang (2006) and Pinkowitz and Williamson (2007) who find that the value of cash holdings increase with the degree of financial constraints. Denis and Sibilkov (2009) document that the cash holdings of financially constrained firms facilitate efficient investment, thus increasing firm value. Consistent with this, we show that cash-rich acquirers do not always make bad acquisitions. In fact, firms who hold more cash and anticipate greater financial constraints do better in the context of acquisitions.

Masulis, Wang, and Xie(2007) postulate that stronger corporate governance relates to better merger performance. Our study is different in that we focus on the cash-holdings effect on acquirer performance, in the presence of financial constraints. Further, the positive cash-holdings

[6] An expanded investigation into the question why the nature of cash holding has changed over time can be interesting for further research.

effect is driven by the precautionary motive instead of the agency theory. Harford, Mansi, and Maxwell (2008) report that poorly governed companies dissipate cash quickly by investing in acquisitions or capital expenditures, and cash holdings reduce company value and profitability. We show that financial constraints mitigate the negative effect of cash holdings and induce value-enhancing cash holdings.

The remainder of this paper proceeds as follows. Section 1 reviews the relevant literature; Section 2 specifies the hypotheses; Section 3 describes the sample and data; and Section 4 reports our main empirical results; Section 5 reports the results from the extended analysis; and Section 6 concludes.

1. Literature review

1.1. Agency costs and the performance of cash-rich acquirers

Previous literature has studied the performance of cash-rich acquirers in the framework of Jensen (1986). This theory postulates that companies that have excessive free cash flows make value-destroying acquisitions. Consistent with Jensen's (1986), several studies find that cash-rich acquirers perform poorly in mergers and acquisitions. In particular, Lang et al. (1991) find that acquirers that have low Tobin's Q ratios but high free cash flows incur low announcement returns. Schlingemann (2004) studies a sample of all-cash deals and reports that free cash flow negatively impacts acquirer announcement returns. Harford (1999) finds that, on average, higher excess cash holdings relate to lower acquirer performance. Extending Harford's (1999) analysis, Oler (2008) observes that cash-rich acquirers have worse long-term performance, with performance measured using both stock returns and accounting data. Harford, Mansi, and Maxwell (2008) further find that companies with weaker corporate governance spend cash on capital expenditures and acquisitions more quickly. Consequently, poorly governed managers hold less cash. Different from what we do, they focus on cash-holding decisions rather than acquisition performance. A later study by Harford, Humphery-Jenner, and Powell (2012)

examine the factors causing value destruction in the acquisitions made by entrenched managers. They find that entrenched managers endeavor to avoid loss of control in transactions, overpay the target and pursue low synergy targets. Their study ignores the role of cash in affecting merger efficiency and does not study the role of financial constraints either.

1.2. The value of cash, financial constraints and the precautionary motive of cash holdings

Extent literature offers diverging views on the value of cash. While earlier studies emphasizing the negative implications of free cash flow on shareholders' value (Jensen, 1986; Stulz, 1990), more recent works highlight the positive effect of cash on shareholders' value. Apart from the transaction motive (Baumol, 1952; Miller and Orr, 1966) and the tax motive (Foley, Harzell, Titman, and Twite, 2007), the precautionary motive has attracted much attention (Almeida et al., 2004; Froot, Scharfstein, and Stein, 1993; Keynes, 1936). The precautionary motive maintains that, when financially constrained companies have future investment projects more profitable than current ones, they save cash out of current cash flow to invest in the future. The precautionary motive assumes managers are value-maximizing. Under the precautionary motive, the optimal cash holdings are determined by managers' subject perception of the quality of future projects relative to that of current projects. Worth noting is that the managers may not have the incentive to share his perception fully with the market for the concern of leaking price-sensitive information to competitors; it is also possible that managers have difficulty conveying information about future growth to the market. Therefore, the market may not agree with the manager on the optimal level of cash holdings.

Several empirical studies find that the value of cash varies with the strength of corporate governance. Dittmar and Mahrt-Smith (2006) project that the value of $1.00 of cash is between $1.27 and $1.62 for well-governed firms but only between $0.42 and $0.88 for poorly governed firms. Using international data, Pinkowitz, Stulz, and Williamson (2006) find that the value of cash is higher in countries with better investor protection.

Several other studies find cash is more valuable when companies are financially constrained. Faulkender and Wang (2006) study how the value of cash change with company finance policies. They find the value of cash decreases for firms with easy access to capital markets. Pinkowitz and Williamson (2007) find companies are averse to bank power and tend to hold more cash when bank power is stronger. Denis and Sibilkov (2009) postulate that cash helps financially constrained companies to invest more efficiently.

The precautionary motive constitutes the theoretical foundation of our current paper. We provide a more detailed discussion of it here. Keynes (1936) posits that a major benefit of cash holdings is they a company to undertake valuable investment projects whenever they arise, enhancing firm value ex-ante. He further points out that the benefit of cash holdings is a function of the degree of financial constraints. An unconstrained company can access external financing at any time and therefore does not require to hold cash. Cash holdings do not affect company value in the absence of financial constraints. A later strand of literature shows that financial constraints arise under various types of market imperfections, e.g., adverse selection in equity markets (Myers and Majluf, 1984) and the agency cost of debt (Myers, 1977; Jensen and Meckling, 1976).

Almeida et al. (2004) formally analyze the precautionary motive of cash holdings. In their model, a financially constrained firm chooses between a current and a future project. If the manager believes that the future project is more valuable than the current one, she discards the current project and saves cash from current cash flows so that she can invest in the future project when this opportunity arrives. Optimal cash holdings occur when the expected marginal return to the future project equals the expected marginal return to the current project. Importantly, keeping the concavity of the production function constant, the more valuable the future project is compared to the current one, the stronger the incentive to save out of the current cash flow (p1785 Almeida et al., 2004). Almeida et al. (2004) assume that companies can fully hedge the risk of cash flow generated from the assets in place. As a result, a company is only concerned with the expected value of cash flows and not cash flow volatility. Han and Qiu (2007) extend

Almeida et al.'s (2004) model by assuming firms can only partially hedge their cash flow risk. They demonstrate that, when the marginal return to the future project is convex for a certain amount of cash saved from current cash flows, the marginal return to the future project increases with cash flow volatility. The increased marginal return to the future project induces managers to save more cash from current cash flows, which equalize the marginal returns to the current and the future projects (proposition 1, Han and Qiu, 2007). When the concavity of the production function is constant, a greater marginal return indicates the future project is more valuable. In Appendix B, we further elaborate the mechanism that generates this positive relation between optimal cash savings and the value of the future project. Our focus here is not on the cash flow sensitivity of cash. Rather, we emphasize the positive relation between optimal cash holdings and the value of the future project relative to the current project, building on the model of Almeida et al. (2004).

An earlier study by Kim, Mauer, and Sherman (1998) also models how the optimal company cash holdings relate to future investments. However, the trade-off in their model is not between the current and the future projects, but between investments and cash savings in the same period. In another theoretical study, Froot, Scharfstein, and Stein (1993) posit that higher cash holdings enhance firm value by shielding investment capability from the negative impact of volatile cash flows. In a more recent study, Riddick and Whited (2009) demonstrate that firms hold more cash when external financing is more costly or when firm cash flows are riskier.

A strand of literature provides empirical evidence consistent with the precautionary motive. Extant studies have demonstrated that high-growth companies hold more cash in both the U.K. and the U.S. (Kamien and Schwartz, 1978; Opler, Pinkowitz, Stulz, and Williamson, 1999; Almeida et al., 2004; Ozkan and Ozkan, 2004; and Khurana, Martin, and Pereira, 2006) and that higher cash flow volatility leads to greater cash holdings (Han and Qiu, 2007; Opler et al., 1999; Bates et al., 2009; and Gryglewicz, 2011). Acharya et al. (2007) demonstrate, both theoretically and empirically that firms prefer holding more cash to retiring debt when they perceive a financing gap between cash flows and investment opportunities (i.e., cash flows and

investment opportunities are not synchronized). Duchin (2010) finds that diversified companies hold less cash when investment opportunities at the divisional level are less correlated and when cash flows at some divisions are highly correlated with the investment opportunities available at other divisions (a smaller financing gap). He argues that this phenomenon occurs because diversified companies can transfer cash across divisions to finance investments. However, to our knowledge, previous literature largely focuses on the determinants of cash holdings under the precautionary motive. Much less is known about how companies benefit from cash held under the precautionary motive. In this paper, we fill in this gap by demonstrating that cash-rich acquirers with financial constraints benefit from acquisitions.

2. Hypotheses

Bates et al. (2009) find a secular trend that firms hold more cash, as a response to the firms' increasing precautionary demand for financial slack. Based on the precautionary motive (Keynes, 1936; Almeida et al., 2004; Han and Qiu, 2007； Denis and Sibilkov, 2009), firms build up cash holdings in anticipation of high growth opportunities in the future. Such financial slack is particularly valuable in the presence of greater financial constraints due to various kinds of market frictions (e.g., Myers and Majluf, 1984; Myers, 1977; Jensen and Meckling, 1976). In so far as higher cash holdings relate to the anticipations of better investment opportunities, we should expect these anticipations manifest themselves through the superior performance of subsequent actual investments, including acquisitions. To the extent there are uncertainties with regards to when a good investment opportunity arises, the actual acquisition announcement resolves uncertainties and raises share prices. To fix idea, we explain more specifically below. In the context of acquisitions, a firm anticipating financial constraints is likely to hold more cash when its manager believes that future projects are more valuable, ceteris paribus. The market observes the level of acquirer cash holdings and infers the expected value of the future project. Stock prices before an acquisition should have incorporated such expectation. However, an update to the acquisition probability should lead to higher announcement returns on cash-richer

acquirers. In particular, let $E(V_H)$ denote the expected value of an acquisition available to a cash-rich company H, and let $E(V_L)$ denote the expected value of an acquisition available to a cash-poor company L. According to the precautionary motive, $E(V_H) > E(V_L)$ if the concavity of the production function is constant. Suppose both acquisitions are anticipated to the same extent by the stock market with the anticipated acquisition probability of $p < 1$ (i.e., the market does not fully anticipate the deal). At the deal announcement, the return on company H should be higher than the return on company L, i.e., $(1 - p)\, E(V_H) > (1 - p)\, E(V_L)$. Therefore, there is a positive cash-holdings effect on acquirer announcement performance. [7,8] We formulate the following hypothesis:

Hypothesis 1 (H1): A cash-rich acquirer has better announcement returns than a cash-poor acquirer.

Since cash holdings and financial constraints are all observable, the market has expectations about the acquisition. Our analysis above demonstrates that the presence of a stock market reaction to merger announcement relies on the assumption that the deal not fully anticipated. When the stock market fully anticipates a merger, the share price does not respond to the actual announcement, and stock returns are not sensitive to the variation of cash holdings. Therefore, we have the following hypothesis:

Hypothesis 1a (H1a): The positive cash holdings effect on acquirer announcement returns is more pronounced for unpredicted acquirers.

Keynes (1936) points out that the benefit of cash holdings is an increasing function of the degree of financial constraints. Faulkender and Wang (2006), Pinkowitz and Williamson (2007) and Denis and Sibilkov (2009) all find that the value of cash holdings increase with the degree of

[7] In Appendix B, we build on Almeida et al.'s (2004) argument, and provide a technical note to explain, in the context of M&A, how the expected value of a future project relates to cash holdings.

[8] Jovanovic and Braguinsky (2004) suggest that investing in acquisitions may indicate the lack of good internal growth opportunities. This should bias against finding a positive relation between cash holdings and acquirer performance.

financial constraints. An unconstrained company can raise external fund at any time without frictions and, therefore, does not have the precautionary demand for cash. In other words, when companies are not financially constrained, the precautionary is irrelevant, and higher cash holdings do not indicate better future investment opportunities. Therefore, we expect the positive cash holdings effect on acquirer performance is driven by financially constrained acquirers, which leads to the following hypothesis.

Hypothesis 1b (H1b): The positive cash holdings effect on acquirer announcement returns is more pronounced for financially constrained acquirers.

The value of an acquisition manifests itself through the operating performance over the long term after the transaction. Therefore, we have the following hypotheses:

Hypothesis 2 (H2): A cash-rich acquirer has better post-acquisition operating performance than a cash-poor acquirer.

Hypothesis 2a (H2a): The positive cash holdings effect on acquirer operating performance is more pronounced for financially constrained acquirers.

3. Sample and Data

We retrieve our initial sample of acquisitions from the Security Data Corporation (SDC) mergers and acquisitions (M&A) database. The sample period is from 1984 to 2012. We also gather a sample of U.K. acquisitions during the same period to examine whether our results also apply outside of the U.S. We impose several selection criteria to the initial samples. First, we follow Harford (1999) and only include the major types of acquisitions, i.e., mergers, acquisitions of majority interests, acquisitions of remaining interests and acquisitions of partial interests.[9] Second, all acquisitions were completed, allowing us to analyze post-acquisition

[9] These transactions are defined by the SDC and are commonly used in the studies on M&A. In a merger, all target shares outstanding are acquired and businesses are combined. In an acquisition of majority interests, the acquirer holds less than 50% of the target before the deal and more than 50% after the deal. In an acquisition of minority interests, the acquirer holds less than 50% of the target before the transaction and less than 50% after the

operating performance. Third, following Harford (1999), both the acquirer and the target must be publicly listed firms. By focusing on public targets, we avoid confounding issues such as loss of control to new block shareholders and the targets' demand for liquidity (Chang, 1998; Fuller, Netter, and Stegemoller, 2002). This way, we also have a sample comparable to those of the previous studies. A practical reason to exclude private targets is that data are required to calculate the targets' operating performance before the acquisition. Fourth, means of payment (i.e., the percentages of stock, cash and mixed payments) must be available from the SDC. To mitigate recording error, we require the sum of the percentages of stock, cash and mixed payments to be no less than 95% and no more than 105%. Fifth, deal value must be available and no less than £10 million. This criterion removes transactions that have little price impact. Sixth, deal announcement and completion dates must be available from the SDC. Seventh, we exclude financial acquirers (SIC 6000-6999) whose cash holdings are of a different nature than those of industrial firms and utility acquirers (SIC 4900–4999), which are intensely regulated. Eighth, we require data available to calculate performance measures (CRSP/Compustat for the U.S. and Datastream for the U.K.). To measure acquirer performance at the deal announcement, we calculate the cumulative abnormal returns (CAR) from two days before to two days after the announcement, i.e., CAR (−2, +2). Abnormal returns are estimated using the market model. If the announcement day is a public holiday, we use the subsequent trading day as day 0. The estimation period is a 250-day window ending 15 trading days before the announcement day (we require at least 30 non-missing daily stock returns within the estimation window). A 5-day test period is chosen in case the announcement date recorded by the SDC is inaccurate. To measure operating performance, we use the adjusted operating performance following Healy, Palepu, and Ruback (1992), Harford (1999) and Powell and Stark (2005). In particular, we measure the actual operating performance by first deducting the change in working capital from the operating cash flow and then scaling by total assets. We adjust an acquirer's operating performance using the median performance of other firms in the same industry, size decile, and operating-

transaction. In an acquisition of remaining interests, the acquirer holds more than 50% of the target before the transaction and the entire target after the transaction.

performance decile. The final measure, Post-acquisition operating performance, is the combined firm's adjusted operating performance averaged over the three years following deal completion. Pre-acquisition operating performance is the value-weighted (using the market value of assets) average of the acquirer's and target's adjusted operating performances, averaged over the three years before deal announcement. Ninth, we require data available (from CRSP/Compustat for the U.S. sample and DataStream and Thomson One Banker for the U.K. sample) to estimate the excess cash ratio (refer to Appendix A for details) and the predicted and unpredicted acquirers (refer to Appendix C for details). Cash holdings can be from either internal or external cash flows. Tenth, we require data to be available to calculate all control variables used in our regressions. These data are from DataStream, Thomson One Banker, CRSP, and Compustat. The control variables include: the probability of being an acquirer (estimated using equation C.1); acquirer total assets; acquirer market-to-book ratio (defined as the sum of the market value of equity and the book value of long-term liabilities divided by the sum of book value of equity and book value of long-term liabilities); acquirer leverage (defined as the book value of debt over total assets); acquirer asset tangibility (defined as the ratio of tangible assets to total assets); acquirer return on assets (ROA) (defined as operating income over total assets); relative deal value (defined as the deal value divided by the acquirer's market value of equity); acquirer average sales growth over the two years before deal announcement; and cash payment (%) (the percentage of consideration paid in cash). All acquirer characteristics are measured at the fiscal year end before deal announcement unless otherwise stated. For approximately 30% of our U.K. sample, DataStream codes are available, but accounting information is missing from WorldScope. We manually collect missed accounting data for these acquirers from the annual reports provided by Thomson One Banker. All variables are in 1994 values. The final sample includes 2423 (564) acquisitions with the full range of data required for our main regression analysis of the U.S. (the U.K.). We winsorize all continuous variables at the 1st and 99th percentiles, except for the CAR.

Table 1 reports the summary statistics. The CAR (−2, +2) has a mean of −0.3% and a median of −0.6%, neither of which is statistically significant (test statistics not tabulated). The mean Excess cash ratio is 0.2% (median −0.1%), suggesting the actual cash ratio of U.S. acquirers on average are not far from the target level estimated using publicly available information. There is a large variation in the Excess cash ratio, however: the standard deviation is 16%. Acquirers on average have an adjusted operating performance of 5.6% before deal announcement, and 8.5% after deal completion, suggesting acquisitions on average are value enhancing. The average Whited-Wu index is 1.33, and the median is 0.24, indicating that in the U.S., some acquirers are highly financially constrained. Of the 2,423 acquirers, 1,251 firms have never obtained a bond rating.

We further separate the entire sample into cash-rich and cash-poor acquirers (i.e., high- and low-cash groups based on sample median). There is no statistically significant difference in CAR (−2, +2) between cash-rich and cash-poor acquirers. Regarding the adjusted operating performance, the cash-rich group marginally outperforms the cash-poor group before acquisitions (z-statistic = −1.879) and significantly outperform after acquisitions (z-statistic = −2.011). Cash-rich acquirers on average are less financially constrained. In particular, high-cash acquirers have an average Whited-Wu index of 0.131, and 601 of the 1,212 cash-rich acquirers have never received a bond rating. In contrast, the cash-poor group has an average Whited-Wu index of 0.306 and 650 of the 1,211 cash-poor acquirers have never obtained a bond rating. Although there seems to be a negative association between cash richness and the degree of financial constraints, it is entirely possible a cash-rich acquirer is also financially constrained. This is because financial constraints occur when a company cannot finance all available investment projects.

[TABLE 1]

4. Empirical Results

4.1. The Positive Cash-holdings Effect on Acquirer Announcement Performance

We use the following baseline model to test H1:

$$CAR_i = \alpha + \beta_1 Excash_i + \lambda Controls_i + \gamma YDUM_i + \delta INDDUM_i + \varepsilon_i, \quad (1)$$

where i indexes the acquirers; CAR is the acquirer's cumulative abnormal returns measured from 2 days before to 2 days after the announcement day, i.e., CAR (−2, +2); Excash represents the logarithm of acquirer excess cash ratio, i.e., log (1+ excess cash ratio); and Controls is a vector of control variables suggested by previous literature, including the probability of being an acquirer, acquirer size measured by log (1 + total assets), asset tangibility, returns on assets, log (1 + average sales growth), log (1 + market-to-book ratio), leverage, relative deal value, cash payment (%), a tender offer dummy, a friendly deal dummy, and a diversifying deal dummy. YDUM and INDDUM are a year and industry dummy respectively.[10] We also control for the probability of being an acquirer because, otherwise, two acquisitions of the same value may have different acquirer announcement returns if the extent of market anticipation differs between these two deals. The probability of being an acquirer is estimated using Equation (C.1) in Appendix C.

Equation (1) is a naive specification because it does not consider how the degree of market anticipation alters the acquirer's cash-holdings effect at the announcement. In H1a, we predict the positive cash-holdings effect to be more pronounced for unpredicted acquirers. We use the following specification to test H1a:

$$\begin{aligned} CAR_i = {} & \alpha + \beta_2 Excash_i \times \text{Predicted-acquirer Dummy}_i + \\ & \beta_3 Excash_i \times \text{Unpredicted-acquirer Dummy}_i + \\ & \eta \text{Unpredicted-acquirer Dummy}_i + \lambda Controls_i + \gamma YDUM_i + \delta INDDUM_i + \varepsilon_i \end{aligned} \quad (2)$$

[10] We use the logarithm of excess cash reserve to mitigate the problem of extreme values due to a large change in cash holdings.

where the Unpredicted-acquirer Dummy is 1 for an unpredicted acquirer and 0 otherwise; the Predicted-acquirer Dummy is defined oppositely (see Appendix C for details).

In model 1 of Table 2, we test H1 using the naive specification of equation (1). The variable log (1 + excess cash ratio) has a significantly (at the 5% level) negative coefficient of −0.021, which indicates the agency theory dominates the precautionary motive in determining the acquirer cash-holdings effect. Model 2 tests H1a based on equation (2), distinguishing between the predicted and unpredicted acquirers. The cash-holdings effect for unpredicted acquirers is significant and positive, consistent with H1a. Specifically, the interaction term between unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.030 and significant (at 5%). A one-standard-deviation increase in the acquirer's excess cash ratio relates to a 0.44 percentage point increase in acquirer CAR (−2, +2). This result is different from the negative acquirer cash-holdings effect documented for the period 1976–1993 by Harford (1999). Model 3 is the same model estimated from 1984 to 1993, similar to Harford's (1999) sample period. We observe a negative cash-holdings effect for unpredicted acquirers, similar to the finding of Harford (1999). It suggests agency costs are the dominant force determining the acquirer cash-holdings effect in the early sample period. The fact that we can replicate Harford's (1999) results is reassuring, showing that our results are not due to specific empirical design. Moving to the 1990s, we estimate equation (2) over 1994 – 2001 (model 4) and find acquirer cash holdings have a marginally positive effect on CAR (−2, +2), with a coefficient of 0.028. We further estimate equation (2) over the period after the enactment Sarbanes-Oxley Act, i.e., 2002 – 2012 (model 5). Model 5 shows that log (1 + excess cash ratio) has a significantly (at the 1% level) positive coefficient of 0.239 for unpredicted acquirers, which is almost nine times the magnitude of the positive cash-holdings effect in the 1990s. The evolvement of the cash holdings effect over the last few decades is in line with the secular trend of increasing precautionary demand for cash documented by Bates et al. (2009). Firms put more and more emphasis on growth opportunities over time, and cash flow uncertainties are higher than before (Bates et al., 2009). McLean (2011) also provides evidence, from his analysis on new equity issues, which are consistent with the

increasing precautionary demand for cash in the last few decades. The increased precautionary demand for cash strengthens the positive effect of valuable financial slack on acquirer performance. Meanwhile, investors' awareness of corporate governance and shareholder rights has improved noticeably since the enactment of the Sarbanes Oxley Act (Bebchuk, Cohen, and Wang, 2013; Cremers and Ferrel, 2014), which curtails the negative effect of free cash. From the regression analysis, we also observe that the coefficient on the interaction term of the predicted acquirer dummy and log (1 + excess cash ratio) is insignificant at the conventional level in all the regressions. As we discussed earlier in the hypotheses development, the market reaction to the announcement of already anticipated acquisition is minimal, and thus less sensitive to the variation in acquirer cash holdings. Overall, our results are consistent with the changes in firm and economic fundamental over the last few decades which enhance the precautionary motive and mitigate the agency costs. These results demonstrate that cash holdings do not necessarily lead to bad acquisitions on average.

In table 3, we move on to examine how financial constraints impact cash-rich acquirers' performance (H1b). The specification is as follows,

$$CAR_i = \alpha + \beta_1 Excash_i \times Unpredicted\ Acquirer\ Dummy_i + \beta_2 Excash_i \times Unpredicted\ acquirer\ dummy_i \times FCDum_i + \beta_3 Excash_i \times Predicted\ acquirer\ dummy_i + \eta Unpredicted\ acquirer\ dummy_i + \rho FCDum_i + \lambda Controls_i + \gamma YDUM_i + \delta INDUM_i + \varepsilon_i \quad (3)$$

where FCDum represents either a High Whited-Wu index dummy or the No bond rating dummy. The High Whited-Wu index dummy is one if the acquirer's Whited-Wu index is above the sample median and 0 otherwise; the No bond rating dummy is one if the acquirer has never received a bond rating and 0 otherwise, as is defined in table 1.

In model 1 of table 3, the coefficient on the two-item interaction term of the unpredicted acquirer dummy and log (1 + excess cash ratio) remains positive (0.079) and significant at the 1% level. Notably, the coefficient on the three-item interaction of the high Whited-Wu index dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.115 and statistically significant at the 1% level. Adding this coefficient to the coefficient on the two-item interaction yields a sum of 0.194 (0.079 + 0.115). Therefore, in the presence of high financial constraints, a one-standard-deviation increase in an average acquirer's cash holdings is associated with a 2.9 percentage point increase in acquirer *CAR (−2, +2)*. In model 2, we measure high financial constraints using the No bond ration dummy. The coefficient on the two-item interaction term of the unpredicted acquirer dummy and log (1 + excess cash ratio) is positive (0.025) but statistically insignificant. The coefficient on the three-item interaction of the No bond rating dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.078 and statistically significant at the 1% level. Therefore, in the presence of high financial constraints (measured by the No bond rating dummy), a one-standard-deviation increase in an average acquirer's cash holdings relates to a 1.5% increase in acquirer *CAR (−2, +2)*. These results suggest that cash-rich acquirers do not destroy value; further, in the presence of high financial constraints, they create value for their shareholders. These findings are consistent with the view that financially constrained companies have greater precautionary demand for cash (Bates et al., 2009). Faulkender and Wang (2006) and Pinkowitz and Williamson (2007) posit that cash holdings carry greater value for financially constrained firms; Denis and Sibilkov (2009) suggest that financially constrained firms are more likely to invest in value-enhancing projects. Our results show that, in the presence of financial constraints, cash-richer acquirers are more likely to make value-creating deals. Higher cash holdings of financially constrained acquirers are most likely to be accumulated due to the precautionary demand and, therefore, are associated with greater acquisition deal synergies.

4.2. The Positive Cash Holdings Effect on Acquirer Post-acquisition Operating Performance

In table 4, we proceed to we test how cash holdings relate to acquirer operating performance in post-acquisition years. This test allows us to examine the robustness of the positive cash-holdings effect to an alternative performance measure to the announcement returns. Specifically, we test H2 and H2a using the following specification in the spirit of Healy et al. (1992), Harford (1999) and Powell and Stark (2005),

$$\begin{aligned}\text{Post-Acquisition OPF}_i = {} & \alpha + \beta_1 \text{Pre-Acquisition OPF}_i + \\ & \beta_2 \text{High Excash Dummy}_i + \\ & \beta_3 \text{High Excash Dummy}_i \times \text{FCDum}_i + \text{'} \\ & \beta_4 \text{FCDum}_i + \varepsilon_i\end{aligned} \tag{4}$$

where i indexes the acquirers; OPF denotes the adjusted operating performance (defined in table 1); the High Excash Dummy is one if the acquirer's excess cash ratio is above the sample median and 0 otherwise. Operating performance may be a function of company characteristics. By adjusting the actual operating performance, we address this possible endogeneity issue to a certain extent. As per Healy et al.(1992), α measures the increment to operating performance in the post-acquisition years. A significant and positive (negative) α indicates the acquisitions are value-enhancing (value-reducing) on average. The coefficient on the High Excash Dummy, β_2, captures the performance difference between cash-rich and cash-poor acquirers. To separate the cash holdings effects for more and less financially constrained acquirers, we focus on the coefficient on the interaction term between the High Excash Dummy and FCDum, i.e., β_3. In equation 4, a dummy variable has a coefficient easier to interpret than that on a continuous variable because its coefficient can be directly added to the intercept to capture the increment to operating performance.

Model 1 of Table 4 yields a significantly (at the 1% level) positive constant term of 0.038, indicating the acquisitions in our sample are value enhancing on average, which is consistent with what Healy et al. (1992) observe. In Model 2, the High excash dummy has a marginally significant (at the 10% level) positive coefficient of 0.01 and the interaction term

between the High excash dummy and the high Whited-Wu index dummy has a significantly (at the 5% level) positive coefficient of 0.159. This result demonstrates that cash-rich acquirers marginally outperform cash-poor ones by one percentage points per year when the acquirers are less financially constrained. Cash-rich acquirers' outperformance is much more pronounced under greater financial constraints — 16.9 percentage points higher than cash-poor ones'. In model 3, we replace the High Whited-Wu index dummy using the No bond rating dummy, our results from model 2 persist is robust to this variation. According to Healy et al. (1992), synergies reflected in the announcement returns manifest themselves through post-acquisition operating performance. Our results extend the findings of Healy et al. (1992) by demonstrating that 1) there is a positive cash-holdings effect on acquirer post-acquisition operating performance and 2) this positive cash-holdings effect is more pronounced in the presence of greater financial constraints.

5. Extended Analysis

5.1. Corporate Governance and the Acquirer Cash-holdings Effect on Performance

The precautionary motive and the agency theory jointly determine the acquirer cash-holdings effects. The direction of the effect is sensitive to the relative strength of these two mechanisms. Our analysis so far reveals a positive cash-holdings effect which is stronger for more financially constrained acquirers, suggesting the dominance of the precautionary motive over the agency theory. As is mentioned in the introduction, financial constraints discipline agency costs (Jensen, 1986; Stulz, 1990) and at the same time enhance the precautionary demand for cash (Almeida et al., 2004; Han and Qiu, 2007; Bates et al., 2009). Therefore, the stronger positive cash-holdings effect under greater financial constraints can be due to greater precautionary motive, weaker agency costs or both. In table 5, we further investigate the existence of these mechanisms.

Specifically, we examine the cash-holdings effects for the subsamples defined based on variables measuring the strength of corporate governance — the E-index (Bebchuk, Cohen and

Ferrell, 2009) and the CEO duality (Brickley, Coles, and Jarrell, 1997; Rechner and Dalton, 1991; Baliga, Moyer, and Rao, 1996; Masulis, Wang, and Xie, 2007).[11] Instead of calling it "CEO duality," we use the terms combined/separated leadership to facilitate subsequent discussions. A separated leadership structure or a higher E-index indicates stronger corporate governance (see table 1 for definitions). Under weak corporate governance, the agency theory plays a more important role determining the acquirers' cash-holdings effect than it does under strong corporate governance. Therefore, we expect the role of financial constraints is more of weakening the negative cash-holdings effect documented by Harford (1999). Under strong corporate governance where agency costs are much controlled, we expect the role of financial constraints to be more of strengthening the positive cash-holdings effect suggested by the precautionary motive. Both mechanisms predict a positive coefficient on the three-item interaction between the high Whited-Wu index dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) in equation (3) and a positive coefficient on the two-item interaction term between the High Excash Dummy and FCDum in equation (4). The difference is that the former mechanism is more likely to manifest itself under weak governance and the later more likely under strong governance.

Model 1 of Panel A in Table 5 estimates equation (3) using the subsample of acquirers with separated leadership (strong corporate governance). The coefficient on the interaction term between unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.033 and statistically significant at 5%. The coefficient on the three-item interaction of the High Whited-Wu index dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is positive (0.175) and statistically significant at the 1% level, suggesting financial constraints further enhance the cash-rich acquirers' performance under strong corporate governance. In model 2, we replace the high Whited-Wu index dummy with the No bond rating dummy and find similar results. In model 3 of

[11] Using the G-index of Gompers, Ishii, and Metrick (2003) yields similar results. The E-index summarizes the six most essential elements of the G-index (Bebchuk, Cohen, and Ferrell, 2009). Data needed to calculate the E-index have been available from RiskMetrics since 1990. Moreover, RiskMetrics does not provide all the data needed to calculate the G-index for years after 2006.

Panel A in Table 5, we re-estimate equation (3) using the sample of acquirers with combined leadership (weak corporate governance). We find a negative and statistically significant (at the 1% level) coefficient of −0.145 on the two-item interaction term between the unpredicted acquirer dummy and log (1 + excess cash ratio). This is consistent with what Harford (1999) finds, but Harford (1999) does not consider the varying strength of corporate governance. There is a positive and statistically significant (at the 1% level) coefficient of 0.223 on the three-item interaction of the High Whited-Wu index dummy, unpredicted acquirer dummy and log (1 + excess cash ratio). This positive coefficient offsets the negative coefficient on the two-item interaction term, suggesting financial constraints eliminate the negative cash-holdings effects under weak corporate governance. In model 4, we replace the High Whited-Wu index dummy with the No bond rating dummy and find results similar to those from model 3. In models 5 – 8, we estimate equation (3) based on the subsamples separated according to E-index. Since the E-index is only available to large companies since 1990, we have a small sample size here. Largely, our results from models 1 – 4 persist in models 5 – 8. We observe a positive and significant cash-holdings effect among financially constrained companies in all models. The only difference is with the coefficient on the two-item interaction term of the unpredicted acquirer dummy and log (1 + excess cash ratio) — it has a positive sign but is statistically insignificant at the conventional level under high E-index (weak corporate governance). This result indicates that the negative cash-holdings effect on performance observed under weak corporate governance and financial constraints is not robust among companies with E-index (most likely large companies).

In panel B of Table 5, we analyze the cash-rich acquirers' adjusted post-acquisition operating performance conditional on their financial constraints, using subsamples. Specifically, we estimate equation (4) using subsamples defined based on the leadership structure and the E-index. In model 9, the acquirers have separated leadership (strong corporate governance). The High cash dummy is 0.069 but only marginally significant at the 10% level. The coefficient on the interaction term between the High cash dummy and the High Whited-Wu index dummy is 0.107 and significant at the 5% level (p-value = 0.038). Therefore, financial constraints

strengthen the positive cash-holdings effect on acquirers' operating performance when corporate governance is strong. In model 10, we re-estimate equation (4), replacing the High Whited-Wu index dummy with the No bond rating dummy. We obtain results similar to those from model 1. In model 11, we estimate equation (4) using the subsample where acquirers have combined leadership (weak corporate governance). The coefficient on the High cash dummy is significantly (at the 5% level) negative at −0.025, indicating cash-richer acquirers underperform absent strong financial constraints, conditional on weak corporate governance. The coefficient on the interaction term between the High cash dummy and the High Whited-Wu index dummy is 0.135 and significant at the 5% level, consistent with our prediction that stronger financial constraints mitigate the negative cash-holdings effects on acquirer operating performance under weak corporate governance. In model 12, we substitute the No bond rating dummy for the High Whited-Wu index dummy and repeat the estimation. The coefficient on the interaction term between the High cash dummy and the High Whited-Wu index dummy is 0.011 and marginally significant at the 10% level, partially offsetting the negative coefficient of −0.031 on the High cash dummy. In models 13 – 16, we define subsamples using the E-index. We obtain results similar to those from models 9 – 12. The positive cash-holdings effect among financially constrained acquirers is present in all models.

Overall, in table 5, we verify our conjecture that the role of financial constraints has two folds — strengthening the positive cash-holdings effect under the precautionary motive and weakening the negative cash-holdings effect under the agency theory. The strengthening role is more pronounced than the weakening role because the presence of the negative cash-holdings effect is dependent on the variable we use to define the subsamples of strong and weak governance.

5.2. Source of Cash Holdings and the Acquirer Cash-holdings Effect on Performance

Schlingemann (2004) finds that the sources of finance have a significant impact on acquirer announcement returns. In this section, we extend our analysis by investigating how the acquirer cash holdings effect varies according to the sources of cash holdings. In particular, we

focus on the recentness of cash holdings and the sources of cash holdings (i.e., new equity issues, the new debt issues and internally generated cash).

A quick accumulation of cash may have less to do with a firm's long-term growth strategy. It could be due to sudden cash windfalls (e.g., Blanchard, Lopez-de-Silanes and Shleifer, 1994) or transient upswing of cash flows. Therefore the cash accumulated recently are less likely related to the precautionary motive, and the positive cash holdings effect should be weaker for a firm that experiences a large increase in cash holdings in recent years. That said, recent increase in holdings may reflect the latest revision of a firm's growth prospects, which the market perceives as a response to the latest update of a firm's precautionary demand for cash. In Table 6, we calculate the change in total cash holdings over the past three years before deal announcements and construct a Recent-Holdings dummy (one if the change is above the sample median and zero otherwise). We then form a three-item interaction of the Recent-Holdings dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) which we add to our regression analysis. Specifically, we estimate the following regression,

$$CAR_i = \alpha + \beta_1 Excash_i \times Unpredicted\ Acquirer\ Dummy_i + \beta_2 Excash_i \times Unpredicted\ acquirer\ dummy_i \times SourceDum_i + \beta_3 Excash_i \times Predicted\ acquirer\ dummy_i + \eta Unpredicted\ acquirer\ dummy_i + \rho SourceDum_i + \lambda Controls_i + \gamma YDUM_i + \delta INDUM_i + \varepsilon_i \quad (5)$$

where SourceDum is the Recent-Holdings dummy.

In Model 1 of Table 6, we report the regression result. The coefficient on the three-item interaction is 0.019 but statistically insignificant (p-value = 0.155), which suggests the stock market does not distinguish between the cash-holdings that are long-held and those accumulated recently. The two effects we discussed above seem to co-exist and balance out on average. We

also note that the coefficient on the two-item interaction term of unpredicted acquirer dummy and log (1 + excess cash ratio) remains significantly positive at 0.029 (p-value = 0.041)

We then turn to the sources of cash holdings. Specifically, we calculate the net equity issues, net debt issues and internally generated cash over the past three years before deal announcement, and create a High New Equity, a High New Debt and a High Internal Cash dummy respectively (one for a value above the median and zero otherwise). We then estimate three different regressions, replacing the SourceDum with the High New Equity, High New Debt, and High Internal Cash dummy respectively in equation (5).

In model 2 of Table 6, the coefficient on the three-item interaction term of the High New Equity dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is positive at 0.077 and statistically significant at the 5% level (p-value = 0.011). It is apparent cash holdings accumulated through equity issuance has a stronger positive effect on acquirer announcement returns. Cooney and Kalay (1993) postulate that when companies face both good and bad projects, issuing and investing send good news that the project is valuable. In a later study, McLean (2011) observes firms that have strong precautionary demand accumulate cash holdings through the proceeds of share issuance. Schlingemann (2004) further points out that, at the time of issuance, the market can be uncertain about the actual usage of equity raised, and the announcement of a subsequent acquisition materializes the good news and the market respond positively. Consistently, McConnell and Muscarella (1985) find the stock market react positively when firms announce an increase in their capital spending. In so far as equity issuance carries good news, our result is consistent with the findings of these previous studies.

In model 3 of Table 6, the coefficient on the three-item interaction term of the High New Debt dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.160 but statistically insignificant (p-value = 0.156). Therefore, the extent to which the accumulation of cash holdings via debt issuance does not impact the cash holdings effect on acquirer returns. This observation is consistent with the two-fold effect of debt: on the one hand, disciplines the

wasteful use of cash but, on the other hand, reduces financial flexibility that is valuable to firms (Stulz, 1990).

In model 4 of Table 6, we find the coefficient on the three-item interaction term of the High Internal Cash dummy, unpredicted acquirer dummy and log (1 + excess cash ratio) is 0.086 and statistically insignificant at the 5% level (p-value = 0.022). Almeida et al. (2004) posit that financially constrained firms save more cash out of current cash flows when their future projects are more valuable. Our result is consistent with their argument.

In a nutshell, we find the source of cash holdings matters for the cash-rich acquirers' returns. However, it does not matter how recent the acquirers accumulated the cash holdings.

5.3. Is the Positive Cash-holdings Effect on Acquirer Performance Present in the U.K.?

In the previous sections, we find the cash-holdings effect is predominantly positive and financial constraints play an essential role determining this positive effect. In this section, we examine the robustness of our results in a different institutional setting using U.K. data. We aim to demonstrate that the positive cash-holdings effect and the importance of financial constraints for this effect are not just U.S. phenomenon.

Table 7 reports the summary statistics of our U.K. sample. The acquirer CAR (−2, 2) has a mean of 0.2% and a median of 0.1%, neither of which is significantly different from zero (test statistics not tabulated). The mean Excess cash ratio is −3.6% (median −0.8%). An average acquirer has an adjusted annual operating performance of 3.781% over the three years before the deal announcement and 6.625% over the three years post deal completion, suggesting acquisitions in the U.K. enhance acquirer shareholders' value on average. The average Whited-Wu index is 0.84 (median 0.59), and 257 of the 564 acquirers have never obtained a bond rating. In the right-hand section of Table 7, we compare the medians of cash-rich and cash-poor acquirers. Median CAR (−2, +2) is significantly higher for cash-rich acquirers than for cash-poor

ones (z-statistic = −2.528). Regarding operating performance, cash-rich acquirers significantly outperform the cash-poor ones both before and after the acquisitions. The cash-rich group has a significantly (at the 5% level) higher market-to-book ratio of assets than the cash-poor group (1.529 vs. 0.673). Cash-rich acquirers are less financially constrained according to the Whited-Wu index: they have a median Whited-Wu index of 0.499 as opposed to a median of 0.688 of the cash-poor group. Regarding bond rating, cash-rich and cash-poor acquirers are similar: 130 out of the 282 cash-rich acquirers and 127 out of the 282 cash-poor acquirers have never obtained a bond rating.

In Model 1 of Table 8, we estimate equation (1). The estimation reveals a significantly (at the 1% level) positive coefficient of 0.018 on log (1 + excess cash ratio), indicating that a one-standard-deviation increase in the excess cash ratio of an average acquirer increases the CAR *(−2, +2)* by 0.37 percentage point. Model 2 of Table 8 estimates equation (2). The coefficient on the interaction term between log (1 + excess cash ratio) and the unpredicted acquirer dummy is 0.024 and statistically significant at the 5% level (p-value = 0.044), which means a one-standard-deviation increase in acquirer cash holdings leads to an increase in acquirer CAR (−2, +2) of 0.49 percentage point. The result from Model 2 is consistent with hypothesis H1a — the positive cash-holdings effect on acquirer announcement returns is more pronounced for unpredicted acquirers.

In model 3 and 4, we further examine how financial constraints impact the cash-holdings effect. We hypothesize that the positive cash-holdings effect is most pronounced for financially constrained acquirers (H1b). Model 3 estimates equation (3), measuring financial constraints using the High Whited-Wu index dummy. The three-item interaction term of the High Whited-Wu index dummy, log (1 + excess cash ratio) and the unpredicted acquirer dummy has a significantly (at the 1% level) positive coefficient of 0.025. The coefficient is 0.028 on the two-item interaction between log (1 + excess cash ratio) and the unpredicted acquirer dummy, but it is statistically insignificant. This coefficient measures the cash-holdings effect of less financially constrained acquirers. Adding these two coefficients gives 0.053, suggesting a one-standard-

deviation increase in the cash holdings of financially constrained acquirers' leads to an increase in acquirer *CAR (−2, +2)* of one percentage point. In Model 4, we substitute the No bond rating dummy for the high White-Wu index dummy and obtain similar results. The results in Table 8 show that the positive cash-holdings effect persists with U.K. acquirers and financial constraints are essential in determining this positive effect.

In Table 9, we examine the cash-holdings effect on acquirers' post-acquisition adjusted operating performance, based on equation (4). Model 1 of Table 9 has a significant (at the 1% level) constant of 0.018, suggesting U.K. acquirers' operating performance on average increases by 1.8 percentage points post-acquisition. In Model 2, the High cash dummy is positive at 0.011 but is only marginally significant (p-value = 0.057). The coefficient on the interaction term between the High cash dummy and the High Whited-Wu index dummy is significantly (at the 5% level) positive at 0.027. Combined with the coefficient on the High cash dummy, it means cash-rich acquirers outperform cash-poor ones by 3.8% a year when they are financially constrained. This is consistent with the prediction of hypothesis H2a. In model 3, we substitute the No bond rating dummy for the High Whited-Wu index dummy and obtain similar results. The coefficient on the High cash dummy is 0.02 and becomes statistically significant at the 5% level.

Overall, the results discussed in this section show that the positive cash-holdings effect and the related importance of financial constraints are robust to the institutional setting of the U.K.

6. Conclusion

Previous literature finds cash-rich acquirers make bad acquisitions. In this paper, we find this phenomenon is restricted to early sample period and to only a few specifications where acquirers are less financially constrained and have weak corporate governance. Importantly, we show cash-richer acquirers predominantly make better acquisitions, which is particularly pronounced when acquirers are financially constrained. Our results suggest the precautionary motive is more relevant than the agency theory in determining the cash-holdings effect on

acquirer performance when acquirers are more financially constrained. When the precautionary demand for cash is strong, higher acquirer cash holdings relate to better investment opportunities, greater deal synergies, and better acquirer performance.

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Figure 1

The Relation between Optimal Cash Savings and the Value of a Future Project

This figure illustrates why greater cash savings relate to higher future project values. The vertical axis indicates the marginal return to investments, and the horizontal axis indicates the amount invested in the current (period 0) or future (period 1) project. BB' represents the marginal return curve of the period 0 project. AB, A'B', and A"B' are the marginal return curves of the period 1 projects. $E(C_1)$ is the expected cash flow in period 1 from the assets in place, which is given. C is the cash savings from the period 0 cash flow, which is carried forward into period 1. A higher C implies more investment in the period 1 project and less in the period 0 project, and the marginal return curve of the period 0 project (BB') has its horizontal axis reversed (i.e., less investment occurs as one moves to the right of BB'). Optimal cash savings (C* or C'*) occur when the marginal return to the period 0 project equals the marginal return to the period 1 project (i.e., B or B'). According to Almeida et al. (2004) and Han and Qiu (2007), higher optimal cash savings (C'*) are associated with higher marginal returns to the period 1 project (B'). The concavity of the production function is constant (as assumed by Almeida et al., 2004, and Han and Qiu, 2007). That is A'B' and AB have the same slope for any given value of $E(C_1) + C$, and higher optimal cash savings (e.g., C'*, which is greater than C*) relates to a higher-value period-1 project (i.e., the area defined by A'B'IK is greater than the area defined by ABIJ). The assumption of constant production function concavity is necessary. To see this, suppose the slope of the marginal return curve is less negative (curve A"B'). In other words, the second derivative of the production function is less negative. In such a case, higher cash savings C'* are associated with a higher-value period-1 project if and only if the area of A"AL is less than LBJKB'. Nonetheless, to the extent that most new production technologies are not revolutionary, but rather incremental to the existing technologies during the tenure of a company's management, the assumption of constant production function concavity is reasonable.

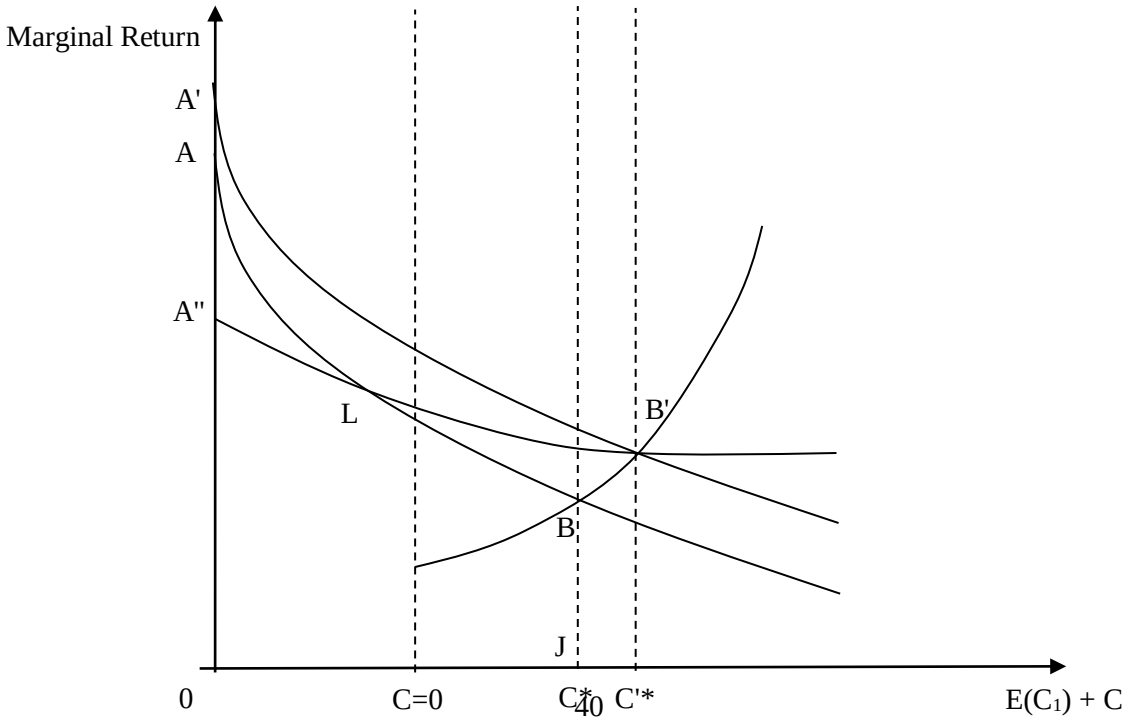

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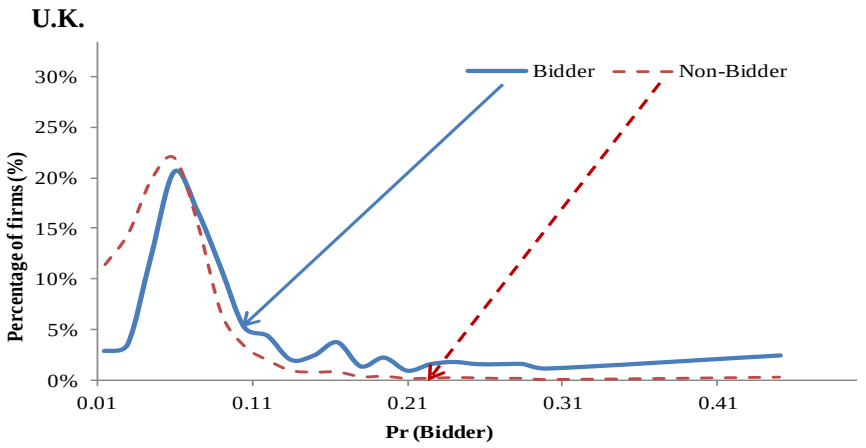
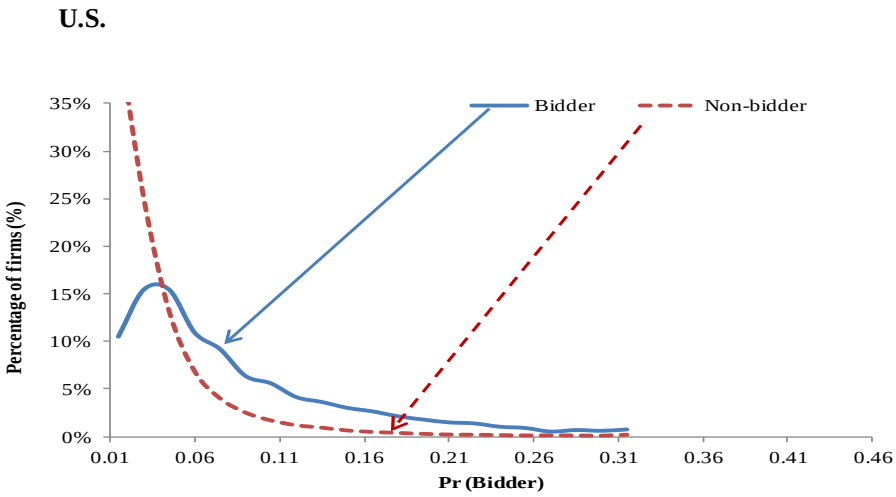
Figure 2
Predicted and Unpredicted Acquirers

Probability density functions (PDFs) of being an acquirer, pr(acquirer), are plotted for acquirer firm-years and non-acquirer firm-years separately. These curves cross at 0.057 (0.030) for the U.K. (U.S.) sample, which is the threshold we use to determine whether an acquirer is predicted or not. To generate the distributions, we first estimate a logistic model based on all firm-years to predict acquirers and then estimate the fitted probabilities of being an acquirer. We then plot the distributions of pr(acquirer) for acquirer firm-years and non-acquirer firm-years. An acquirer in a year whose pr(acquirer) falls to the right (left) of the threshold is predicted (unpredicted). This method is similar to that used by Palepu (1986) and Harford (1999).





Appendix A: Measuring excess cash reserves

We estimate a company's target cash reserve ratio in the spirit of Opler et al. (1999). The residuals from the regression are the excess cash reserve ratios. In particular, we estimate a pooled time-series cross-sectional ordinary least squares (OLS) regression with year dummies. The sample used for the estimation includes all firm-years during the 1975–2014, using data available from Datastream (for the U.K.) and Compustat (for the U.S.). The specification is as follows:

$$Cash\ Reserve\ Ratio_{it} = \beta_1 MTB_{it} + \beta_2 Size_{it} + \beta_3 CFAST_{it} + \beta_4 NWCAST_{it} + \beta_5 CAPEXAST_{it} + \beta_6 LEV_{it} + \beta_7 INDSIGMA_{it} + \beta_8 R\&D_{it} + \beta_9 DIVDUM_{it} + \gamma YDUM_t + \varepsilon_{it}$$

, (A.1)

where i and t index firms and years, respectively; Cash reserve ratio is cash and short-term investments over total assets; MTB is the market-to-book ratio of assets; Size is the logarithm of total assets in millions of 1994 currency; CFAST is the income before depreciation and amortization over total assets; NWCAST is net working capital over total assets; CAPEXAST is capital expenditures over total assets; LEV is total debt over total assets; INDSIGMA is the mean cash-flow standard deviation of the firms in the same 2-digit SIC code industry (cash flow is deflated by total assets, and standard deviation is estimated over the previous 20 years); R&D is the expenditure on research and development normalized by net sales; DIVDUM is a dummy variable set to one if a firm pays dividends in a year and zero otherwise; and YDUM is a vector of year dummies. It is arguable that financially constrained firms are more likely to hold cash. Although we do not specifically have a financial constraint variable in the model, variables already included should have considered the various dimensions that impact financial constraints (e.g., LEV, Size, DIVDUM and so on). We also estimate Equation (A.1) by industry. Our results are robust to this variation. According to Dittmar and Mahrt-Smith (2007) and Fresard and Salva

(2010), the market-to-book ratio can be reversely affected by cash holdings. We use sales growth over the past three years as an instrument for the market-to-book ratio and re-estimate Equation (A.1). The historical sales growth is exogenous because current cash holdings are unlikely to affect past sales growth. Our results are robust to this alternative estimation. We also verify the robustness of our results to the alternative calculation of the excess cash reserve ratio used by DeAngelo, DeAngelo, and Stulz (2010) (footnote five on page 287). Specifically, in each year, we simultaneously sort all non-financial firms that meet our sampling criteria into three equal-sized groups based on total assets and three equal-sized groups based on the market-to-book ratio of assets. We then allocate an acquirer to one of these nine groups based on its size and market-to-book ratio. Within each group, we measure the target cash reserve ratio by the median of all firms in the same 2-digit SIC industry. Our results are broadly consistent using this alternative measure. We report these estimation results in Table A1.

[Table A1]

Appendix B: Technical note: the mechanism underlying the positive cash holdings effect at the announcement

In the introduction, we briefly mention that the update to acquisition probability leads to the positive cash holdings effect. Essential to this argument is the ex-ante relation that $E(V_H) > E(V_L)$, i.e., holding the concavity of the production function constant across different future projects (as assumed by Almeida et al., 2004), more cash holdings relate to a more valuable future project. Figure 1 illustrates why, and we elaborate below.

The vertical axis represents the marginal return on investments, and the horizontal axis represents the amount of investment in the current (period 0) or future (period 1) project. In the framework developed by Almeida et al. (2004), C_0 (not shown in the figure) is the period 0 cash flow from assets in place. C is the cash saved from C_0 and carried over to period 1 to invest. $E(C_1)$ is the expected cash flow from the assets in place in period 1, which is given. When

choosing the optimal C, a company faces a trade-off between a current project (in period 0) and a future project (in period 1). The company invests $C_0 - C$ in the current project and $E(C_1) + C$ in the future project. The optimal cash savings (C^*, C'^*) occurs when the marginal return to the period-0 project (represented by curve BB') equals the marginal return to the period-1 project (curves AB, A'B' or A''B') (Equation 4 of Almeida et al., 2004).[12] For a period-1 project with the marginal return curve AB, C* is the optimal cash savings, and the area of ABIJ represents the expected value of the project. When the period-1 project is more profitable (Almeida et al., 2004) or the cash flows from the assets in place are more volatile (Han and Qiu, 2007), the marginal return to the period-1 project increases, and such increase induces the company to save more in period 0 and invest more in period 1. Therefore, C'* > C*, where C'* is the updated optimal cash savings. When the concavity of the production function remains constant, the updated marginal return curve of the period-1 project is A'B', i.e., AB moves outwards. Note that with the constant concavity of the production function, as is the case here, the slopes of AB and A'B' are the same at any given value of $E(C_1) + C$. In other words, the marginal returns on investments diminish at the same rate for AB and A'B'. Almeida et al. (2004) do not require AB and A'B' to be convex, i.e., AB and A'B' can be straight lines. Han and Qiu (2007), however, require that the marginal return (i.e., AB and A'B') be convex, and the cash flow volatility is not necessarily fully hedged, which generates a positive relation between cash flow volatility and optimal cash savings. In both Almeida et al. (2004) and Han and Qiu (2007), the area of A'B'IK (i.e., the value of the period-1 project corresponding to C'*) is greater than the area of ABIJ (i.e., the value of the period-1 project corresponding to C*).

[FIGURE 1]

The conclusion above may change if the assumption of constant concavity is not true. In Figure 1, the slope of the marginal return curve A''B' is less negative than the slope of AB, i.e.,

[12] Because a higher C means more investment in the period 1 project and less investment in the period 0 project, the marginal return curve for the period 0 project (BB') has its horizontal axis reversed (i.e., there is less investment as one moves to the right of BB'). C=0 is the point at which no cash from period 0 is carried forward and at which the marginal return to the period 0 project is the lowest.

the marginal return diminishes at a lower rate for A"B' than for AB. In this case, when the optimal cash savings are C'*, the area of A"B'IK is not necessarily greater than that of ABIJ. The area of A"B'IK is greater than that of ABIJ if and only if the size of area A"AL < LBJKB'. Nonetheless, to the extent that most new production technologies are not revolutionary, but rather are incremental to the existing technologies during the tenure of a company's management, the assumption of invariant production function concavity is reasonable. This assumption implies that the speeds at which the marginal returns diminish are similar across different future investments (A'B' and AB in Figure 1). To take further precaution against possible confounding effects of varying production function concavity, we control for industry effects in our regression analyses. Production technologies available to the same industry are more similar to one another compared to technologies available to different industries. Our results are robust to the effects of both the Fama-French 12 industries and Fama-French 49 industries. We report only the results of regressions estimated using the Fama-French 12 industries for the sake of brevity, but the results using the Fama-French 49 industries are available upon request.

Appendix C: Predicted and unpredicted acquirers

We follow a two-step procedure to separate the sample into predicted and unpredicted acquirers. In the first step, we estimate the probability of being an acquirer using the following logistic model for both the U.K. and U.S. following the specification below:

$$\text{Acquirer}_{i,t} = \alpha + \beta_1 \text{Excash}_{i,t-1} + \lambda \text{Controls}_{i,t-1} + \gamma \text{YDUM}_{i,t} + \delta \text{INDDUM}_{it} + \varepsilon_{i,t}, \qquad \text{(C.1)}$$

where i and t index companies and years, respectively; Acquirer is a dummy variable that equals 1 for a firm-year in which a company announces at least one acquisition and 0 otherwise; Excash is log (1 + excess cash reserve ratio); YDUM is a vector of year dummy variables from 1984 to 2012; INDDUM is a vector of industry dummy variables; and Controls is a vector of control variables. The control variables include: the logarithm of total assets, leverage, the logarithm of

the market-to-book ratio of equity, return on assets, mean abnormal returns over the past 3 years, standard deviations of daily stock returns over the past 3 years, and non-cash working capital, defined as net working capital (i.e., current assets – current liabilities) minus cash and marketable securities, then divided by total assets.[13] The estimates are available upon request.

Next, we estimate the fitted probabilities of being an acquirer for each firm-year. We then plot the distribution of the fitted probabilities for the acquirer firm-years and non-acquirer firm-years in Figure 2. The figure indicates that these distributions cross at 0.06 for the U.K. sample and 0.045 for the U.S. sample. An acquirer that falls to the right (left) of the crossover point is predicted (unpredicted). There is a concern that this classification scheme tends to classify low-cash acquirers as unpredicted acquirers because cash holdings may positively predict being an acquirer. However, we compare the mean and median excess cash holdings between predicted and unpredicted acquirers (not tabulated) and find no significant differences. Therefore unpredicted acquirers are not equivalent to acquirers with low cash holdings.

[FIGURE 2]

[13] The mean abnormal returns are computed as the daily abnormal returns averaged over the 3 years prior to the announcement. Abnormal returns are estimated using a market model. The estimation period is a window of 250 trading days that ends 16 trading days prior to the day for which abnormal returns are calculated.