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The Influence of Cash Ownership on Financial Performance: An Examination of Disruptors and Acquirers

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Abstract: Cash ownership emits a powerful positive signal. We examine four sources of cash in firms, i.e., cash flows, cash holdings, cash proceeds from debt, and cash proceeds from equity. We examine the effects of cash ownership for firms growing by disruption, and firms growing by acquisition. Information signaling theory maintains that free cash flows may be used to increase shareholder wealth. Two-stage least squares regressions determined the impact of cash funding on disruptors and size of acquisition in the first stage, and cash-funded disruption or cash-funded acquisition in the second stage, for a US sample of 832 disruptor firms and 924 acquirers, from 2000–2020. Disruptions funded by cash holdings, cash flow, and cash proceeds from debt, significantly increased stock returns. A size effect was observed, with small disruptors showing significant effects. Acquisitions funded by cash holdings, cash flow, and cash proceeds from debt, significantly increased stock returns and return on assets. Agency costs significantly reduced returns and profits. Results for disruptions and acquisitions support signaling theory with free cash flows signaling higher share prices for both disruptors and acquirers, and higher profits for acquirers.

Keywords: disruptions; acquisitions; cash; cash flow; pecking order; debt proceeds; equity proceeds

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1. Introduction

Cash ownership emits a positive signal. Firms that have cash can easily pay dividends, signaling future profitability. They may pursue growth opportunities by hiring leading talent at competitive wage rates, invest in plant and equipment, or acquire other firms. La Rocca et al. (2019) found that SMEs in Europe significantly increased growth opportunities due to cash holdings. Examinations of cash mergers have observed higher contemporaneous stock returns for U.S. cash acquirers (Abraham et al. 2011), and both higher contemporaneous stock returns and long-term stock returns for U.K. acquirers (Gregory and Wang 2013). Such cash ownership is in the form of cash holdings or cash flows.

Four sources of cash exist in firms. They include (1) cash flows, which are the sum of net income and depreciation expense, less taxes; (2) cash holdings, which are accumulations of cash flows; (3) cash proceeds from debt, the cash deposits from bond issuance; and (4) cash proceeds from equity, the cash deposits from stock issuance. The free cash flow hypothesis views managers as not being completely aligned with the goals of shareholders of shareholder wealth maximization. Excess cash may motivate managers to invest in negative NPV projects, as they can increase their power by increasing the firm's growth. With low growth opportunities, free cash flow may signal overinvestment, reducing stock returns and reducing profits. We test the free cash flow hypothesis by specifying disruptions and acquisitions as growth opportunities, while partialing out the effects of agency costs. This test also applies to cash holdings, as they are accumulations of cash flows.

Another cash flow theory is pertinent to this study. The information signaling hypothesis posits that there is information asymmetry between managers and investors. By increasing dividends, cash reserves, and cash flows, managers communicate their expectations to investors that they predict that future earnings will increase. The theory has been tested thoroughly with dividend payouts. This positive signal from dividend payouts may be reflected in higher stock prices and higher profits (Miller and Modigliani 1961). Among others, Healy and Palepu (1988) and Brickley (1983) provided empirical evidence to support the information signaling hypothesis.

Cash ownership may also take the form of cash proceeds from debt issuance or cash proceeds from equity issuance. The pecking order theory (Myers and Majluf 1984) sets forth that firms use internal financing, followed by debt, followed by equity. Firms adjust the dividend payout ratio to avoid selling shares, thereby diluting equity. As dividends decrease, cash increases, so that internal financing contains rising levels of cash. As debt or equity are issued, cash proceeds are generated. Does cash ownership result in higher agency costs as per the free cash flow hypothesis? The evidence is mixed. For financially distressed firms, Anton and Nucu (2019) observed that cash holdings increased firm value, which peaked and then declined due to agency costs. Gregory and Wang (2013) found that cash acquisitions overcame agency costs to during UK merger announcements, to earn significantly higher returns. Kroes and Manileas (2014) offered similar support for the strong positive influence of cash flow on Tobin's q for up to eight quarters in the future, suggesting the overcoming of agency costs. It is possible that the type of growth strategy being pursued may influence the effect of cash on firm performance. Accordingly, we explore cash effects on performance for specific growth strategies, including disruptions and acquisitions.

The purpose of this paper is to investigate the impact of cash-funded disruptions and cash-funded acquisitions on firm performance. As an example, Uber is a cash-funded disruption. By offering transportation by a network of private automobile owners, Uber used the funds raised to disrupt the taxi industry, by adding a fleet of private cars to compete with the collection of taxis. Facebook's acquisition of Instagram was a cash-funded acquisition, whereby a cash-rich firm bought a smaller firm in a related business area. We aim to seal research gaps with both disruptions and acquisitions. Disruptive strategies occur when "technology or new business models reinvent or reshape an existing business" (Walton 2017, p. 1). For example, electric vehicles have disrupted the automobile industry. Instead of the gasoline engine, with a multitude of moving parts, the typical electric vehicle has few parts, and lithium-ion batteries. Concomitant with the reduction in parts is the elimination of gasoline usage. Amazon disrupted retailing by showing that an online bookseller could diversify into a vast array of retail products. The academic literature on the financial performance of disruptors is non-existent. Several database searches have yielded articles from the corporate strategy literature, though none from the finance literature. How are disruptions funded? Through cash holdings? Cash flows? Debt proceeds? Equity proceeds? Does the method of funding influence stock returns, or profitability? Does firm size influence results? Disruptors range from small startups (Airbnb and Uber, at their inception) to large Fortune 500 companies, such as Microsoft's entry into cloud services. It is worthwhile, from an academic standpoint, to advance knowledge of cash-funded growth strategies by examining the impact of cash-funded disruptions from different cash sources on firm performance.

With acquisitions, the aforementioned studies have provided some evidence of the positive influence of acquisitions on stock returns, and Tobin's q, even with agency costs. Yet, these studies are dated, with empirical studies from 2013–2014. Therefore, it is necessary to update them, using contemporary samples. We feel that measures of profitability must be included. Acquirers are large, as the ability to purchase another firm requires a sufficiently large amount of capital. As the profits of the target increase the profits of the acquirer in an additive sense, it is possible that cash-funded acquisitions increase profitability measures, including return on assets and return on equity. We draw a distinction between cash holdings and free cash flow. Cash holdings are large, in that they accumulate over time.

Cash flow is current, as cash flow = net income + depreciation − taxes. Since cash flow is smaller in size, it may yield less significant effects on stock returns and profits than cash holdings. We also examine the effects of cash proceeds from the issuance of debt, and the cash from the issuance of equity. These sources of cash may be considered to be cash for investment needs in smaller quantities than cash holdings, which accumulate over time.

The remainder of this paper is organized as follows. Section 2 is a Review of Literature, Section 3 is Hypotheses Development, Section 4 is Methods and Materials, Section 5 is Results, and Section 6 is the Conclusions.

2. Review of Literature

A few studies have described the positive effects of corporate cash holdings on firm performance in a variety of international settings. Jabbouri and Almustafa (2021) found a significant positive relationship between corporate cash holdings and firm performance in 12 MENA countries from 2004–2018, in countries with strong national governance, and more developed institutional settings. Dimitripoulos et al. (2020) observed positive effects of cash holdings on firm performance before, and particularly after the Greek debt crisis of 2003–2016, for a sample of Greek SMEs. Ahn et al. (2020) found similar results for a 1991–2013 sample of US firms, which showed higher financial statement comparability with the industry. Cuong (2019) observed an increase in firm profits for a sample of Vietnamese firms from 2008–2017.

For the effects of cash flows on firm performance, we refer to the information signaling hypothesis and the free cash flow hypothesis. The information signaling hypothesis posits that there is information asymmetry between managers and investors. By increasing dividends, cash reserves, and cash flows, managers communicate their expectations to investors that they predict that future earnings will increase. Turki (2019) found less negative stock returns at the announcement of dividend-paying, rather than non-dividend paying stock dividend bidders. Dividends were sending the positive signal of increases in future earnings, thereby reducing negative stock price reactions. Chauhan and Pathak (2021) measured dividend payouts for firms with transparent earnings. Public knowledge of earnings restricted managers' informational advantage over investors. Consequently, they used dividends to signal their private expectations of increases in future earnings.

Conversely, the free cash flow hypothesis views excess cash as a signal of overinvestment in negative NPV projects, resulting in reductions in stock returns and profits. These conditions prevail if growth opportunities are low, freeing up excess cash, or if agency costs abound permitting managers to make unproductive investments. A few recent studies support the free cash flow hypothesis. Chu and Liu (2016) observed that firms with higher levels of free cash flow paid more for real estate, using real estate transactions from 2004–2011. Agency costs were more severe with lower growth opportunities. Okofo-Durtey and Kwenda (2021) found that free cash flows motivated managers to undertake merger and acquisition transactions in ten emerging markets, from 2004–2013. Chen and Fu (2011) found that firms with few growth opportunities had cash levels that were significantly associated with abnormal returns.

2.1. Cash Holdings and Growth Opportunities

Intuitively, cash holdings fund growth opportunities. Firms with large cash reserves can draw upon these reserves to fund new product development, hire talent, or enter new markets. Such funding is particularly important for financially constrained firms. As studies have shown, the presence of financial constraints may be mitigated by large cash reserves, as investors place higher value on the firm's cash balance (Faulkender and Wang 2006; Jensen 2022). Jensen (2022) demonstrated that performance advantage of high-cash firms over low-cash firms occurred during periods of constrained funding. Growth opportunities act as a financial constraint. In a seminal paper on capital structure, Myers and Majluf (1984) set forth that there is higher information asymmetry for firms with growth opportunities, as corporate insiders have more information about the firm's growth opportunities than

external investors. The uncertainty of growth prospects increases financing costs. Cash holdings can reduce such high financing costs and high financial distress costs. Faulkender and Wang (2006) observed that the level of cash holdings significantly reduced business risk. Further, firms with growth opportunities were more likely to have high cash balances to avoid high-cost external financing and bankruptcy costs. A similar result was obtained for technology spillovers by Qiu and Wan (2015), who found that technology-intensive firms with newer patents had higher cash balances. The greater perceived risk for such firms stimulated them to carry higher cash balances.

We were able to locate a single study that examined the impact of cash holdings on the financing of specific growth opportunities. Fresard (2010) observed that firms with cash reserves had larger market share gains than competitors with financing constraints, and increased interactions with other competitors. The level of market share increase was higher for cash-rich firms with higher tariffs or restrictions on sales of their products. It follows that the cash balances overcame macroeconomic limitations (such as tariffs) and competitive restrictions (financing constraints) to increase market-share gains. This study suggests that cash holdings may exert an effect on product market performance. We extend these findings by focusing on the success of cash funding of the specific growth opportunities of growth through disruption and growth through acquisition.

2.2. Disruptor Strategies

Disruption reinvents or reshapes an existing business or creates a new business (Walton 2017) An existing business can reposition its core business or create new businesses to benefit from new market opportunities (Leavy 2017). As an example, a beverage producer began selling the zero calorie form of its core product. The firm also acquired a bottled water firm to take advantage in the emerging demand for bottled water. Mature disruptors may take advantage of scarce legacy assets that cannot be easily replicated by smaller competitors. In the case of the beverage producer, legacy assets included production facilities and franchises, created over a century. Small disruptors may demonstrate agility by bypassing the significant infrastructure investment of their large competitors. Airbnb disrupted the lodging industry by locating an inventory belonging to its franchisees, rather than having to build costly infrastructure (Walton 2017). An existing business can use large cash reserves to engage in disruptive strategies. A startup, in contrast, will need to seek funding.

2.3. Cash Acquisitions and Financial Performance

The literature indicates that firms with growth opportunities hold excess cash, presumably to invest in these revenue-enhancing investments (Harris and Raviv 2017; Ozkan and Ozkan 2004). Harris and Raviv (2017) indicated that the amount of cash is less than the investment required so that additional cash needed is obtained through the issuance of mispriced equity.

The signaling effect of cash funding of acquisitions is mixed. Intuitively, a large cash balance suggests the ability of the firm to invest in acquisitions of firms that contribute to its competitive advantage. Conversely, agency costs may result in underperformance. Harford (1999) examined the performance of acquirers with large cash balances. Cash-rich firms made diversifying acquisitions, i.e., acquisitions in industries other than their own. Such acquisitions were followed by significant declines in operating performance. He concluded that the agency costs associated with free cash flows were responsible for the underperformance of firms with excess cash balances in the post-acquisition period. In other words, managers used excess cash to make non-synergistic acquisitions that served their own interests, but were detrimental to the financial performance of the firm. Harford (1999) concluded that cash holdings had a value-destroying effect on returns. Lie and Liu (2018) took issue with Harford's (1999) results, finding that acquirers with high cash balances showed similar returns to acquirers with low cash balances in the post-acquisition period. While they accepted that stock mergers had negative effects on returns, cash balances failed to intensify this negative signal. Agency costs appear to have accounted

for the conflicting results. Another source of differing signals is the source of cash. Chay et al. (2015) found that cash proceeds from debt funded most acquisitions. However, equity issue proceeds were used by large acquirers.

3. Hypotheses Development

3.1. Cash from Disruption and Financial Performance

Cash Holdings Disruptive strategies meet certain criteria. First, the disruptor seeks new customers, as current customers undervalue the innovation. Then, the innovation must accomplish tasks that cannot be accomplished for lack of skills or funds. Finally, the innovation must extend the capabilities of existing products in novel ways (Gilbert 2003). Uber, for example, obtained new customers, as existing customers were dissatisfied with current transportation modes. Using personal cars for commercial transport displaced commercial vehicles to some extent, as they offered more routes, more pick up locations and drop off locations, and lower prices. Disruptors could be either large, cash-rich firms, or smaller, cash-poor startups. The former are likely to have large cash holdings, or cash proceeds from debt. Cash holdings serve as sources of liquidity to invest in the infrastructure needed for the implementation of disruptor strategies. Pinkowitz et al. (2007) found that, over a 40-year period, US firms with high cash levels had stable investments in growth opportunities. In multiple studies, large cash holdings had positive effects on firm value (Huang et al. 2013; Schweitzer and Reimund 2004). It follows that disruptors with high cash holdings may be able to implement revenue-enhancing strategies, leading to positive stock returns.

Hypothesis 1a. *For disruptor firms, cash holdings significantly increase stock returns.*

Cash Flow: Cash flow = net income + depreciation − taxes. It is the cash from operations, along with investments. As disruptors are not heavily invested in property, plant, and equipment, their depreciation tax shields may not be considerable, suggesting that cash flows may be close in value to net income + cash flow from investments. Intuitively, fares for Uber and payments for Airbnb accommodations generate a stream of usage fee income for these disruptors, adding to their cash flow. The literature suggests that liquidity and working capital investment may explain the positive impact of cash flow on stock returns. Almajali et al. (2012) found that liquidity explained the positive association of cash flows with firm performance among Jordanian insurers. Afrifa (2016) conjectured that firms with strong cash flows invest in working capital. Improvements in collections of accounts receivable and reductions in inventory send a positive signal, increasing stock returns.

Hypothesis 1b. *For disruptor firms, cash flows significantly increase stock returns.*

Cash Proceeds from Debt: It is unlikely that small disruptors will qualify for debt funding. On the other hand, large disruptors may qualify for debt funding. They may deposit the cash proceeds, which are retained in the business. The control hypothesis (Jensen 1986) sets forth that such cash proceeds from debt may be used to make interest payments, thereby reducing the cash available for managers to spend on increasing their private benefits. Thus, cash proceeds from debt may reduce the agency costs of free cash flow, which may result in higher stock returns. Akhigbe and Harikumar (1995) found that the use of cash proceeds from debt to fund capital expenditure and working capital generated abnormal stock returns, while similar cash proceeds used to retire debt failed to significantly influence stock returns.

Hypothesis 1c. *For disruptor firms, the cash proceeds from debt may significantly increase stock returns.*

Size and Financial Performance: The above discussion distinguishes between large disruptors and small disruptors. Cash holdings and cash debt from proceeds are expected

to increase security returns for large disruptors, as they create a large source of funds to pay for new growth opportunities, on a scale beyond that of small disruptors. As examples, we can consider the entry of large technology firms into cloud services, or a large pharmaceutical company's investment in a new line of orphan drugs (medicines targeted as specific market segments, with low volume, sold at extremely high prices). We suspect that there is a size effect, in that firms of different size will demonstrate differential effects of cash flow on performance.

Hypothesis 1d. *For disruptor firms, large and small disruptors may display differences in the effect of cash holdings, cash flow, and cash from debt proceeds on performance.*

3.2. Cash from Acquisitions and Financial Performance

Cash Holding-Funded Acquisitions: Acquisitions may be financed from cash holdings. Mitchell et al. (2004) found positive cumulative abnormal returns on acquirer stock on the dates of announcement of cash mergers, and the days immediately following announcement, suggesting that firms that purchase other firms for cash send a strong positive signal to the markets. Such firms are envisioned as being so cash-rich that they can purchase target firms for cash. They are seen as liquid and profitable. An arbitrage strategy pursued at cash mergers is that arbitrageurs purchase the target stock just prior to the merger, holding it until the merger closes. The arbitrageurs thus provide liquidity to the owners of target stock. It is possible that the demand for target stock by the arbitrageurs contributes to the positive signal emanating from the usage of cash.

The pecking order theory (Myers 1984) is based on information asymmetry. Given that managers wish to avoid scrutiny by debtholders and shareholders, they are likely to choose internal financing as the most preferred source of capital. Internal financing is from retained earnings, which by definition, may include cash flows for any year, and cash holdings accumulated over several years. Strong cash flows suggest ongoing profitability, so that highly profitable firms may be less reliant on debt financing (Vassilou et al. 2009). Once internal financing is exhausted, debt becomes the preferred source of capital. The argument is that, as managers have more information about the firm than investors, they will issue undervalued debt, which emits a strong positive signal. Myers (1984) termed debt the safest security, whose value is maintained, when asymmetric information is revealed. It follows that the cash proceeds of debt may be informative, in that the cash proceeds from asset sales by banks have been found to generate abnormal returns at the time of sale (Fee et al. 2014).

Equity is a relatively expensive form of capital with the lack of tax benefits accorded to debt. Therefore, if a strict pecking order of capital structure is expected, the issuance of overvalued equity would be the least preferred form of capital. We expect that small firms and firms with uncertain cash flows are likely to be rejected for debt financing, so that equity financing becomes a necessity. Yet, there is some evidence that net equity issues may seal financing deficits more effectively than net debt issues, suggesting managerial preference for equity capital (Chirinko and Singha 2000). We may conjecture that managerial personal preference for equity may stimulate demand for equity funding among certain firms, so that cash proceeds from such financing may send a signal of future share price increases and future profitability.

Cash Flow-Supported Acquisitions: The information signaling hypothesis posits that there is information asymmetry between managers and investors. By increasing cash flows, managers communicate their expectations to investors that they predict that future earnings will increase. Managers of acquirers, who view the acquisition as adding to firm value, will perceive the addition to cash flows from the target firm as predicting higher future security returns. It follows that cash flows from the combined firm may signal increased stock returns. As target profits are added to acquirer profits, cash flows from the combined firm may increase the profit measures of return on assets and return on equity.

Cash Proceeds from Debt: Cash proceeds from debt are deposited into the acquirer's accounts. By using these amounts to fund acquisitions, management is signaling to the

markets that it considers the target firm to be sufficiently profitable that they are willing to pay interest and fixed payments to service the debt. The cash proceeds are a proxy for an increase in debt that signals future share price increases, and increased profits for the combined firm.

Hypothesis 2a. *For acquirers, cash holdings predict positive stock returns, increased return on assets, and increased return on equity.*

Hypothesis 2b. *For acquirers, cash flow predicts positive stock returns, increased return on assets, and increased return on equity.*

Hypothesis 2c. *For acquirers, cash proceeds from debt predict positive stock returns, increased return on assets, and increased return on equity.*

4. Methods and Materials

4.1. Data Collection

4.1.1. Data Collection of Disruptor Data

Disruptors and non-disruptors were extracted from the COMPUSTAT North America Database. After removing missing information and incomplete company descriptors, a total of 832 equities remained. Firms were classified into disruptors and non-disruptors, on the basis of the definition of disruptors as reshaping existing businesses or creating new businesses. For example, a natural healing clinical treatments firm is considered to be a disruptor, as it reshapes the existing business of clinical treatments. A biopharmaceutical firm creating new product lines based on new technology is disruptive to its industry, due to its pioneering use of technological breakthroughs to develop new medicines. A hedged equity index creates a new business by restricting its ownership to equities employed in creating hedges, which is beyond a regular equity index. In contrast, banks and insurance companies that make loans, underwrite premiums, and pay claims are non-disruptors, as they are engaged in traditional commercial activities.

COMPUSTAT provided the independent variables, dependent variables, and control variables for the 2000–2020 study period. Consequently, the final sample consisted of 832 US disruptors and non-disruptors, from 2000–2020. The independent variables included (1) cash holdings; (2) net income, depreciation, and taxes paid (to compute cash flow); (3) cash from debt proceeds, or cash corresponding to debt increases; and (4) cash from equity proceeds or cash corresponding to equity increases. Net income, total assets, stockholders' equity, and closing stock prices were extracted to compute return on assets, return on equity, and security returns. Control variables were (1) short-term debt, the proxy for agency costs; (2) the debt-equity ratio; (3) the equity multiplier; and (4) total assets, the measure of size.

4.1.2. Data Collection of Acquirer Data

The entire COMPUSTAT North America database was examined to extract firms that showed values for size of the acquisition. Upon removal of acquirers with incomplete data, 924 US acquirers remained for the 2000–2020 study period. The independent variables, dependent variables, and control variables were identical to those employed in the disruptor study. They can be found in Section 4.1.1.

4.2. Data Analysis

4.2.1. Data Analysis of Disruptor Data

Descriptive statistics and correlations are not provided to maintain brevity of tables. A two-stage least squares model was evaluated using the Regression Analysis and Time Series (RATS software), followed by generalized method of moments (GMM estimators) for robustness checks. In the two-stage least squares model, we isolate the disruptions funded by cash and acquisitions funded by cash in the first stage. It is important to us that we measure performance effects of disruptions and acquisitions funded by cash

only. As a robustness check, we used GMM estimators, as we specify debt-equity ratio, equity multiplier, size, and agency cost as instruments explaining firm performance. These variables separate the influence of cash from their own influences, so that the GMM estimators support the results of the two-stage least squares models. The ability of two-stage least squares regressions to isolate an endogenous variable's prediction by an exogeneous variable was shown by Payne's (2011) use of measures affected by federal research funding, though not private donations. The finance literature recommends these methodologies to correct specification errors (Chung et al. 2006; Harvey and Siddique 2000; Theoret and Racicot 2007). Theoret and Racicot (2007) added additional predictors, such as the Chen-Roll-Ross factors to the Fama-French three factor model, to explain hedge fund returns. These factors explained the existing predictors effectively in the two-stage least squares model, and as instruments in the GMM model. Comparisons of these models with ordinary least-squares models yielded higher R^2 values for the former. Likewise, Chan and Faff (2005) showed that GMM estimators overcame specification errors arising from the omission of the illiquidity premium in tests of the Fama-French three-factor model. Agency costs were proxied by short-term debt, as managers who wish to spend funds pursuing their own personal interests are more likely to use liquid sources, which invite less regulatory scrutiny than long-term debt. Omit the Boshnak found that short-term debt had negative effects on return on assets (ROA), while long-term debt had positive effects on return on equity (ROE) for a sample of Saudi-listed firms. Other control variables included the debt/equity ratio, equity multiplier, agency cost, and size, as defined below:

Debt/Equity Ratio = Total Debt/Total Equity,
Equity Multiplier = Total Assets/Total Equity,
Agency Cost = Short-Term Debt,
Size = Total Assets/Total Equity
The first stage regression is as follows:

$$\begin{aligned} Disruptor\ or\ Non\text{-}disruptor\ &= \alpha + \beta_1 Cash\ Holdings + \beta_2 Debt\ Equity \\ &+ \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (1)$$

The resulting disruptor use of cash holdings became the independent variable in the second stage regression as follows:

$$\begin{aligned} RET\ OR\ ROA\quad OR\ ROE \\ &= \alpha + \beta_1 Disruptor\ Usage\ of\ Cash\ Holdings + \beta_2 Debt\ Equity \\ &+ \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (2)$$

A size effect was measured for small firms, medium-sized firms, and large firms. The two-stage least squares regression was repeated with cash flow, cash proceeds from debt, and cash proceeds from equity, in lieu of cash holdings. The equations are presented below:

$$\begin{aligned} Disruptor\ or\ Non\text{-}Disruptor\ &= \alpha + \beta_1 Cash\ Flow + \beta_2 Debt\ Equity \\ &+ \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (3)$$

The resulting disruptor use of cash flow became the independent variable in the second stage regression as follows:

$$\begin{aligned} RET\ OR\ ROA\ OR\ ROE\ &= \alpha + \beta_1 Disruptor\ Usage\ of\ Cash\ Flow + \beta_2 Debt\ Equity \\ &+ \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (4)$$

$$\begin{aligned} Disruptor\ or\ Non\text{-}Disruptor\ &= \alpha + \beta_1 Cash\ from\ Debt\ Proceeds + \beta_2 Debt\ Equity \\ &+ \beta_3 Equity\ Multiplier + \beta + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (5)$$

The resulting disruptor use of cash from debt proceeds became the independent variable in the second stage regression as follows:

$$\begin{aligned} RET\ OR\ ROA\ OR\ ROE\ &= \alpha + \beta_1 Disruptor\ Usage\ of\ Cash\ From\ Debt\ Proceeds \\ &+ \beta_2 Debt\ Equity + \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \end{aligned} \quad (6)$$

$$Disruptor\ or\ Non\text{-}Disruptor\ = \alpha + \beta_1 Cash\ from\ Equity\ Proceeds + \beta_2 Debt\ Equity + \beta_3 Equity\ Multiplier + \beta + \beta_4 Agency\ Cost + \beta_5 Size \quad (7)$$

The resulting disruptor use of cash from equity proceeds became the independent variable in the second stage regression as follows:

$$RET\ OR\ ROA\ OR\ ROE\ = \alpha + \beta_1 Disruptor\ Usage\ of\ Cash\ From\ Equity\ Proceeds + \beta_2 Debt\ Equity + \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \quad (8)$$

4.2.2. Data Analysis of Acquirer Data

In the first stage of the two-stage least squares regression, the dependent variable was size of the acquisition. The remaining variables were identical to Equation (1). The resulting cash holding funded variable became the independent variable, in a similar regression to Equation (2).

The first stage regression is as follows:

$$Size\ of\ Acquisition\ = \alpha + \beta_1 Cash\ Holdings + \beta_2 Debt\ Equity + \beta_3 Equity\ Multiplier + \beta + \beta_4 Agency\ Cost + \beta_5 Size \quad (9)$$

The resulting cash holding-funded acquisition became the independent variable in the second stage regression as follows:

$$RET\ OR\ ROA\ OR\ ROE\ = \alpha + \beta_1 Cash\ Holding\ Funded\ Acquisition + \beta_2 Debt\ Equity + \beta_3 Equity\ Multiplier + \beta_4 Agency\ Cost + \beta_5 Size \quad (10)$$

Equations (7) and (8) were repeated for cash flow-funded acquisitions, acquisitions funded by debt proceeds, and acquisitions funded by equity proceeds. A size effect was measured for small acquirers and large acquirers.

5. Results

5.1. Summary of Results

Table 1 summarizes the hypotheses, and results of hypotheses testing.

Table 1. Summarizes the hypotheses and results of hypotheses testing.

Hypothesis	Results
Disruptors	
Hypothesis 1a: *For disruptor firms, cash holdings significantly increase stock returns.*	Fully Supported.
Hypothesis 1b: *For disruptor firms, cash flows significantly increase stock returns.*	Supported, contrary to the hypothesized direction. Cash flows significantly decrease stock returns.
Hypothesis 1c: *For disruptor firms, the cash proceeds from debt may significantly increase stock returns.*	Fully Supported.
Hypothesis 1d: *For disruptor firms, large and small disruptors display differences in the effect of cash holdings and cash flow on stock returns.*	Rejected for cash holdings. Supported for cash flow. In small firms, cash flow decreased security returns. Cash flow in large firms had no effect on stock returns.
Acquirers Hypothesis 2a: *For acquirers, cash holdings predict positive stock returns, increased return on assets, and increased return on equity.*	Partly Supported, for stock returns, and return on assets.
Hypothesis 2b: *For acquirers, cash flow predicts positive stock returns, increased return on assets, and increased return on equity.*	Partly Supported, for stock returns, and return on assets.
Hypothesis 2c: *For acquirers, cash proceeds from debt predict positive stock returns, increased return on assets, and increased return on equity.*	Partly Supported, for stock returns, and return on assets.

5.2. Detailed Results of Hypotheses Tests

Hypothesis 1a was supported. Table 2, Panel B shows that disruptor usage of cash holdings significantly increases security returns (Coefficient = 69.88, t = 57.45, $p < 0.001$, Table 2, Panel B). No explanation of return on assets or return on equity was observed.

Table 2. Two-Stage Least Squares Regressions of Cash Holdings on Disruption, Followed by Disruption on Financial Performance (Full Sample).

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non-Disruptor				
Independent Variable	Coefficient	Coefficient	Coefficient	Hypothesis Supported/Rejected
Constant	1.42 *** (311.59)	1.42 *** (311.59)	1.42 *** (311.59)	
Cash Holdings	2.81×10^{-6} ** (2.80)	2.81×10^{-6} ** (2.80)	2.81×10^{-6} ** (2.80)	
Debt Equity Ratio	-3.40×10^{-4} (−0.17)	-3.40×10^{-4} (−0.17)	-3.40×10^{-4} (−0.17)	
Equity Multiplier	3.61×10^{-4} (0.18)	3.61×10^{-4} (0.18)	3.61×10^{-4} (0.18)	
Agency Cost	2.72×10^{-7} (0.43)	2.72×10^{-7} (0.43)	2.72×10^{-7} (0.43)	
Size	-8.60×10^{-8} *** (−3.66)	-8.60×10^{-8} *** (−3.66)	-8.60×10^{-8} *** (−3.66)	
Firm/Year Observations	16,349	16,349	16,349	
R^2	6.4×10^{-4}	6.4×10^{-4}	6.4×10^{-4}	
Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns), Return on Assets, Return on Equity				
Independent Variable	Coefficient, Returns as Dependent Variable	Coefficient ROA as Dependent Variable	Coefficient, ROE as Dependent Variable	Hypothesis Supported/Rejected
Constant	−98.64 *** (−57.42)	−4.23 (−0.44)	-8.82×10^{-2} (−0.002)	N/A
Disruptor Usage of Cash Holdings	69.88 *** (57.45)	2.74 (0.41)	−0.42 (−0.15)	Hypothesis 1a Supported
Debt Equity Ratio	154.25 * (2.27)	-2.01×10^{-3} (−0.05)	−0.58 *** (−3.68)	Control Variable
Equity Multiplier	−167.66 * (−2.48)	2.06×10^{3} (0.05)	0.59 *** (3.74)	Control Variable
Agency Cost	0.61 *** (28.65)	1.09×10^{-5} (0.89)	3.35×10^{-6} (0.06)	Control Variable
Size	0.06 *** (72.34)	3.47×10^{-7} (0.72)	6×10^{-7} (0.03)	Control Variable

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, t statistics in parentheses.

Hypothesis 1b was supported contrary to the hypothesized direction. Table 3, Panel B shows that disruptor usage of cash flows significantly reduced security returns (Coefficient = −25.30, t =−20.22, $p < 0.001$, Table 3, Panel B). No explanation of return on assets or return on equity was observed.

Table 3. Two-Stage Least Squares Regressions of Cash Flow on Disruption, Followed by Disruption on Financial Performance (Full Sample).

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non Disruptor				
Independent Variable	Coefficient	Coefficient	Coefficient	Hypothesis Support/Rejection
Constant	1.41 *** (2.87)	1.41 *** (2.87)	1.41 *** (2.87)	
Cash Flow	2.28×10^{-6} *** (7.16)	2.28×10^{-6} *** (7.16)	2.28×10^{-6} *** (7.16)	
Debt Equity Ratio	1.01×10^{-5} (4.75×10^{-3})	1.01×10^{-5} (4.75×10^{-3})	1.01×10^{-5} (4.75×10^{-3})	Control Variable
Equity Multiplier	1.27×10^{-5} (5.98×10^{-3})	1.27×10^{-5} (5.98×10^{-3})	1.27×10^{-5} (5.98×10^{-3})	Control Variable
Agency Cost	1.79×10^{-6} ** (2.95)	1.79×10^{-6} ** (2.95)	1.79×10^{-6} ** (2.95)	Control Variable
Size	-7.40×10^{-8} ** (−3.19)	-7.40×10^{-8} ** (−3.19)	-7.40×10^{-8} ** (−3.19)	Control Variable
Firm/Year Observations	14,382	14,382	14,382	
R^2	0.89	0.89	0.89	

Table 3. *Cont.*

Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns), Return on Assets (ROA), and Return on Equity (ROE)				
Independent Variable	Coefficient, Returns as Dependent Variable	Coefficient, ROA as Dependent Variable	Coefficient, ROE as Dependent Variable	Hypothesis Supported/Rejected
Constant	72.03 *** (20.34)	−2.68 (−0.71)	−13.28 (−0.83)	N/A
Disruptor Usage of Cash Flow	−25.30 *** (−20.22)	1.66 (0.63)	8.83 (0.79)	Hypothesis 1b Supported
Debt Equity Ratio	−68.94 (−0.87)	-2.91×10^{-3} (−0.07)	−0.58 *** (−3.73)	Control Variable
Equity Multiplier	67.33 (0.85)	2.98×10^{-3} (0.08)	0.59 *** (3.80)	Control Variable
Agency Cost	0.85 *** (33.82)	9.79×10^{-6} (0.83)	-1.25×10^{-5} (−0.25)	Control Variable
Size	5.53×10^{2} *** (40.94)	3.25×10^{-7} (0.83)	6.8×10^{-7} (0.41)	Control Variable

** $p < 0.01$, *** $p < 0.001$, t statistics in parentheses.

Hypothesis 1c was supported. Table 4, Panel B shows that disruptor usage of cash proceeds from debt significantly increased security returns (Coefficient = 9.64, t = 54.23, $p < 0.001$, Table 4, Panel B). No explanation of return on assets or return on equity was observed. Table 5 shows that disruptor usage of equity proceeds had no effect on returns or profitability.

Table 4. Two-Stage Least Squares Regressions of Cash Holdings from Debt Proceeds on Disruption, Followed by Disruption on Financial Performance (Full Sample).

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non-Disruptor				
Independent Variable	Coefficient	Coefficient	Coefficient	Hypothesis Support/Rejection
Constant	1.41 *** (23.27)	1.41 *** (23.27)	1.41 *** (23.27)	N/A
Cash Holdings from Debt Proceeds	1.81×10^{-2} * (2.35)	1.81×10^{-2} * (2.35)	1.81×10^{-2} * (2.35)	
Debt Equity Ratio	-2.50×10^{4} (−0.12)	-2.50×10^{4} (−0.12)	-2.50×10^{4} (−0.12)	Control Variable
Equity Multiplier	2.71×10^{-4} (0.13)	2.71×10^{-4} (0.13)	2.71×10^{-4} (0.13)	Control Variable
Agency Cost	1.19×10^{-6} (2.05)	1.19×10^{-6} (2.05)	1.19×10^{-6} (2.05)	Control Variable
Size	0.00	0.00	0.00	Control Variable
Firm/Year Observations	16,664	16,664	16,664	
R^2	0.89	0.89	0.89	
Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns)				
Independent Variable	Coefficient, Dependent Variable Security Returns	Coefficient, Dependent Variable, ROA	Coefficient, Dependent Variable, ROE	Hypothesis Supported/Rejected
Constant	−13.64 *** (−54.11)	7.49 (0.10)	1.83 (0.006)	N/A
Disruptor Usage of Cash Holdings from Debt Proceeds	9.64 *** (54.23)	−5.46 (−0.11)	-1.77 (-8.72×10^{-3})	Hypothesis 1c Supported
Debt Equity Ratio	1.43 (1.95)	-2.87×10^{-3} (−0.07)	−0.58 *** (−3.71)	Control Variable
Equity Multiplier	−1.62 * (−2.20)	3.09×10^{-3} (0.08)	0.59 *** (3.77)	Control Variable
Agency Cost	0.00	1.92×10^{-5} (0.32)	4.80×10^{-6} (1.90×10^{-2})	Control Variable
Size	0.07 *** (71.15)	-6.0×10^{-8} (−0.02)	0.00	Control Variable

* $p < 0.05$, *** $p < 0.001$.

Table 5. Two-Stage Least Squares Regressions of Cash Holdings from Equity Proceeds on Disruption, Followed by Disruption on Financial Performance (Full Sample).

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non Disruptor				
Independent Variable	Coefficient	T-Statistic	Significance	Hypothesis Support/Rejection
Constant	1.41	21.9	0.00 ***	
Cash Holdings from Equity Proceeds	1.66×10^{-2}	2.13	0.03 *	
Debt Equity Ratio	-3.33×10^{-4}	−0.16	0.86	Control Variable
Equity Multiplier	3.52×10^{-4}	0.17	0.85	Control Variable
Agency Cost	1.23×10^{-6}	2.12	0.03 *	Control Variable
Size	-4.6×10^{-8}	−2.42	0.01 *	Control Variable
Firm/Year Observations	16,664			
R^2	0.89			
Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns)				
Independent Variable	Coefficient	T-Statistic	Significance	Hypothesis Supported/Rejected
Constant	35.45	1.43	0.15	N/A
Disruptor Usage of Cash Flow	−24.46	−1.41	0.15	
Debt Equity Ratio	−1.05	−1.42	0.15	Control Variable
Equity Multiplier	1.06	1.44	0.14	Control Variable
Agency Cost	1.18	39.36	0.00 ***	Control Variable
Firm/Year Observations				
R^2	0.27			

* $p < 0.05$, *** $p < 0.001$.

Hypothesis 1d was rejected for cash holdings, but was supported for cash flows. Disruptor use of cash holdings did not vary by firm size (see Table 6, Panel B). However, disruptor usage of cash flow varied significantly by size, as small firms exhibited significant increases in returns (Coefficient = −6.00, t =−10.32, $p < 0.05$, Table 7), unlike large firms.

Table 6. Effect of Varying Asset Sizes. Two-Stage Least Squares Regressions of Cash Holdings on Disruption, Followed by Disruption on Financial Performance.

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non-Disruptor				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	
Constant	1.43	1.42 ***	1.40 ***	
Cash Holdings	1.25×10^{-6}	6.48×10^{-7}	1.14×10^{-6}	
Debt Equity Ratio	-3.76×10^{-4}	-4.10×10^{-4}	-3.5×10^{4}	Control Variable
Equity Multiplier	3.98×10^{4}	4.3×10^{-4}	3.71×10^{-4}	Control Variable
Agency Cost	1.06×10^{-6}	5.03×10^{-7}	9.69×10^{-7}	Control Variable
Size	−0.03 ***	0.00	0.03	Control Variable
Firm/Year Observations	16,349	16,349	16,349	
R^2	0.89	0.89	0.89	

Table 6. *Cont*.

Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	23.11 ***	44.30 ***	−17.18 ***	N/A
Disruptor/Non-Disruptor Usage of Cash Holdings	16.08 ***	31.14 ***	12.17 ***	Hypothesis 1d Supported
Debt Equity Ratio	5.24 ***	11.94 ***	−21.03	Control Variable
Equity Multiplier	−5.57 ***	−12.56 ***	19.90	Control Variable
Agency Cost	−0.89	−0.74 ***	1.15 ***	Control Variable
Size	52.06 ***	0.00	0.00	Control Variable
Firm/Year Observations	16,703	1603	16,703	
R^2	0.37	0.37	0.18	
Panel C: Second Stage Least Squares: Dependent Variable = Financial Performance (Return on Assets)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	−2.75 (−0.74)	−9.15 (−0.42)	5.13 (0.29)	N/A
Disruptor/Non-Disruptor Usage of Cash Holdings	1.54 (0.60)	6.22 (0.41)	−3.61 (−0.29)	
Debt Equity Ratio	-2.36×10^{-3} (−0.06)	2.02×10^{-4} (5.37×10^{-3})	-4.11×10^{-3} (−0.10)	Control Variable
Equity Multiplier	2.41×10^{-3} (−0.06)	-2.17×10^{-4} (-5.79×10^{3})	4.28×10^{-3} (0.11)	Control Variable
Agency Cost	-1.99×10^{-6} (−0.15)	8.84×10^{-6} (0.59)	5.42×10^{-6} (0.29)	Control Variable
Size	0.60 *** (3.53)	0.00 (0.00)	−0.56 (−1.45)	Control Variable
Panel D: Second Stage Least Squares: Dependent Variable = Financial Performance (Return on Equity)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	−17.52 (−1.12)	−6.78 (−0.07)	3.75 (0.05)	N/A
Disruptor Usage of Cash Holdings	11.69 (1.08)	4.28 (0.06)	−3.11 (−0.06)	
Debt Equity Ratio	−0.58 *** (−3.73)	−0.58 *** (−3.67)	−0.58 *** (−3.70)	Control Variable
Equity Multiplier	0.59 *** (3.80)	0.58 *** (3.73)	0.59 *** (3.77)	Control Variable
Agency Cost	-2.48×10^{-5} (−0.47)	-0.07×10^{-8} ($-1.05 \times 10^{-3)}$	4.74×10^{-6} (0.06)	Control Variable
Size	0.45 (0.63)	0.00 (0.00)	−0.01 (-6.5×10^{-3})	Control Variable

*** $p < 0.001$, t statistics in parentheses.

Table 7. Effect of Varying Asset Sizes. Two-Stage Least Squares Regressions of Cash Flow on Disruption, Followed by Disruption on Financial Performance.

Panel A: First Stage Least Squares: Dependent Variable = Disruptor/Non-Disruptor				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Support/Rejection
Constant	1.43 ***	1.41 ***	1.39 ***	
Cash Flow	2.29×10^{-6} ***	2.28×10^{-6} ***	2.30×10^{-6} ***	
Debt Equity Ratio	-1.84×10^{-5}	2.23×10^{-5} ***	2.89×10^{-5}	Control Variable
Equity Multiplier	4.16×10^{-5}	0.00	-6.21×10^{-6}	Control Variable
Agency Cost	2.36×10^{-6} ***	1.6×10^{-6} **	2.22×10^{-6} **	Control Variable
Size	−0.038 ***	0.00	3.66×10^{-2} ***	Control Variable
Firm/Year Observations	14,382	14,382	14,382	
R^2	5×10^{-3}	0.89	0.89	

Table 7. *Cont.*

Panel B: Second Stage Least Squares: Dependent Variable = Financial Performance (Security Returns)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	14.66	15.47 *	17.44 *	N/A
Disruptor/Non-Disruptor Usage of Cash Flow	10.25	−9.81	−10.32 *	Hypothesis 1d Supported
Debt Equity Ratio	−60.71	−59.34	−63.70	Control Variable
Equity Multiplier	61.85	60.55	64.88	Control Variable
Agency Cost	1.15 ***	1.21 ***	1.17 ***	Control Variable
Size	33.66 ***	0.00	−26.54 ***	Control Variable
Firm/Year Observations	14,470	14,470	14,470	
R^2	0.18	0.18	0.18	
Panel C: Second Stage Least Squares: Dependent Variable = Financial Performance (Return on Assets)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	−2.84	−2.69	−2.07	N/A
Disruptor/Non-Disruptor Usage of Cash Flow	1.61	1.68	1.49	
Debt Equity Ratio	-2.10×10^{-3}	-2.4×10^{-3}	-2.80×10^{-3}	Control Variable
Equity Multiplier	2.17×10^{-3}	2.0×10^{-3}	2.85×10^{-3}	Control Variable
Agency Cost	-2.52×10^{-6}	9.56×10^{-6}	-2.09×10^{-6}	Control Variable
Size	0.60 ***	0.00	−0.71 ***	Control Variable
Panel D: Second Stage Least Squares: Dependent Variable = Financial Performance (Return on Equity)				
Independent Variable	Coefficient Large Firms	Coefficient Medium Firms	Coefficient Small Firms	Hypothesis Supported/Rejected
Constant	−14.03	−13.99	−13.94 (−0.89)	N/A
Disruptor/Non-Disruptor Usage of Cash Flow	9.40	9.40	9.46 (0.85)	
Debt Equity Ratio	−0.68 ***	−0.68 ***	−0.58 *** (−3.73)	Control Variable
Equity Multiplier	0.69 ***	0.69 ***	0.59 *** (3.80)	Control Variable
Agency Cost	-2.12×10^{-5}	−1.93	1.94×10^{-5} (−0.37)	Control Variable
Size	0.09	0.00	−0.43 (−0.60)	Control Variable

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A robustness check (reported in Table 8) supported these results, with cash-funded disruption and debt-funded disruption significantly increasing security returns. Cash flow-funded disruptions significantly reduced security returns.

Table 8. Robustness Tests: GMM Estimator Regressions of Returns, ROA, and ROE, on Cash, Cash Flow, with Disruptor/Non-disruptor, Debt Equity Ratio, Equity Multiplier, Short Term Debt, and Total Assets as Instruments.

	MODEL1			**MODEL2**		
Variable	Returns	ROA	ROE	Returns	ROA	ROE
Constant	37.091	1.01	−2.41	37.09	1.21	−2.98
Cash-Funded Disruption	2.51 ***	-6.5×10^{-4}	7.55×10^{-6}			
Cash Flow-Funded Disruption				−0.016 ***	6.7×10^{-6}	1.37×10^{-5}

Table 8. *Cont.*

	MODEL 1			MODEL 2		
Disruptor/Nondisruptor	−65.43	−0.29	1.22	−6.54	−0.35	1.48
Equity Multiplier	−43.94	−1.45	1.47	−43.94	−1.66	1.82
Debt Equity Ratio	50.44	1.66	−1.69	50.4	1.91	−2.10
Agency Cost	0.86	1.5×10^{-4}	-1.08×10^{-5}	0.86	11.86×10^{-5}	1.20×10^{-5}
Size	-5.93×10^{-3}	4.5×10^{-8}	6×10^{-8}	-5×10^{-3}	-3.82×10^{-7}	5.93×10^{-7}
N	15,145	15,179	15,179	15,549	15,549	15,549
	MODEL 3					
	Returns	ROA	ROE			
Constant	1.48	−0.15	1.09			
Cash from Debt Funded-Disruption	3.97 ***	-3.26×10^{-6}	1.22×10^{-6}			
Disruptor/Non-disruptor	−2.41	−0.11	0.77			
Equity Multiplier	19.41	−0.03	0.11			
Debt Equity Ratio	−1.96	0.03	−0.10			
Agency Cost	10.30 ***	1.46×10^{-5}	-6.78×10^{-6}			
Size	0.01 *	-3.26×10^{-6}	1.22×10^{-6}			
N	15,145	15,179	15,179			

* $p < 0.05$, *** $p < 0.001$.

Hypothesis 2a was supported. As shown in Table 9, Panel B, acquisitions funded with cash holdings significantly increased security returns (Coefficient = 2×10^{-4}, t =5.15, $p < 0.001$) and return on assets (Coefficient = 9.2×10^{-5}, $p < 0.001$, Table 9, Panel B).

Table 9. Two-Stage Least Squares Regressions of Acquisition Size on Cash Holdings, Cash Flow, Cash from Debt, and Cash from Equity (First-Stage Regression) and Returns, Return on Assets (ROA) and Return on Equity (ROE) on Cash-Funded Acquisition, Cash Flow-Funded Acquisition, Cash from Debt-Funded Acquisition, and cash from Equity-Funded Acquisition (Second Stage Regression).

Panel A: First Stage Regression, Dependent Variable = Size of Acquisition	
Independent Variable	Coefficients
Constant	214.67 *** (8.34)
Cash	−0.04 *** (−6.27)
Debt Equity Ratio	-5×10^{-3} (−0.14)
Equity Multiplier	23.77 (0.48)
Short-Term Debt	-2×10^{-3} *** (−7.10)
Total Assets	2×10^{-3} *** (28.61)
N, R^2	14,895, 0.16
Constant	198.46 *** (7.74)
Cash Flow	-5.21×10^{-3} *** (−9.49)
Debt Equity Ratio	-5.29×10^{-3} (−0.14)
Equity Multiplier	24.16 (0.49)
Short-Term Debt	−0.03 *** (−9.56)
Total Assets	2.88×10^{-3} *** (28.87)

Table 9. *Cont.*

Panel A: First Stage Regression, Dependent Variable = Size of Acquisition			
N, R^2	15,059, 0.16		
Constant	208.97 *** (0.13)		
Cash from Debt	−0.04 (−0.14)		
Debt Equity Ratio	-5.0×10^{-3} (−0.13)		
Equity Multiplier	−4.99 (−1.00)		
Short-Term Debt	−0.03 *** (−9.80)		
Total Assets	2.34×10^{-2} *** (28.47)		
N, R^2			
Constant	210 *** (8.18)		
Cash from Equity	−0.49 (−0.28)		
Debt Equity Ratio	2.63×10^{3} (0.05)		
Equity Multiplier	−0.85 (−0.01)		
Short-Term Debt	−0.03 *** (−8.53)		
Total Assets	2.22×10^{-2} *** (26.31)		
N, R^2	14,320, 0.15		
Panel B: Second Stage Regression. Dependent Variable = Returns, Return on Assets (ROA), Return on Equity (ROE)			
Independent Variable	Returns	ROA	ROE
Constant	3.81 (9.24)	4.60×10^{-3} * (2.06)	0.41 (1.51)
Cash-Funded Acquisition	2.0×10^{-4} *** (5.15)	9.20×10^{-5} *** (4.35)	-1.3×10^{-4} (−0.50)
N, R^2	16,725, 0.01	16,735, 0.003	16,730, 0.0001
Constant	4.07 *** (1.0)	5.20×10^{-3} ** (2.35)	4.4×10^{-2} (1.64)
Cash Flow-Funded Acquisition	1.4×10^{-3} *** (3.80)	8.0×10^{-5} *** (3.92)	-1.81×10^{-4} (−0.72)
N, R^2	16,923, 0.01	16,933, 0.002	16,928, 0.0001
Constant	3.83 *** (9.34)	4.4×10^{2} * (2.00)	0.28 (1.20)
Cash from Debt-Funded Acquisition	1.84×10^{-3} *** (4.77)	9.28×10^{-5} *** (4.43)	-5.37×10^{-5} (−0.23)
N, R^2	16,923, 0.01	16,933, 0.002	15,981, 0.0001
Constant	0.33 (1.41)	4.0×10^{-2} (1.76)	0.29 (1.25)
Cash from Equity-Funded Acquisition	2.43×10^{-3} *** (10.52)	1.05×10^{-4} *** (4.54)	−1.00 (−0.30)
N, R^2	15,999, 0.01	16,008, 0.003	16,003, 0.0001

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, t statistics in parentheses.

Hypothesis 2b was supported for cash flow for both security returns and return on assets. Table 8, Panel B shows that cash flows significantly increased security returns (Coefficient = 1.4×10^{-3}, t = 3.8, $p < 0.001$, Table 9, Panel B) and return on assets (Coefficient = 8×10^{-5}, t = 3.2, $p < 0.001$, Table 9, Panel B).

Hypothesis 2c was supported. As shown in Table 9, Panel B, acquisitions funded with cash proceeds from debt significantly increased security returns (Coefficient = 1.84×10^{-3}, t =4.77, $p < 0.001$) and return on assets (Coefficient = 9.28×10^{-5}, $p < 0.001$). Table 9 shows a robustness check on Hypothesis 2. GMM estimators used to perform the robustness check support the hypothesized results (see Table 10).

Table 10. Robustness Tests: GMM Estimator Regressions of Returns, ROA, and ROE, on Cash, Cash Flow, with Acquisition Size, Debt Equity Ratio, Equity Multiplier, Short Term Debt, and Total Assets as Instruments.

	MODEL 1			**MODEL 2**		
Variable	Returns	ROA	ROE	Returns	ROA	ROE
Constant	65.65	−2.60	1.12	77.39	−3.94	1.06
Cash-Funded Acquisition	2.61×10^{-4} **	2.69×10^{-5} ***	-1.68×10^{-3}			
Cash Flow-Funded Acquisition				4.57×10^{-4} ***	1.40×10^{-5} ***	-1.36×10^{-5}
Investment in Acquisition	−0.10	7.77×10^{-3}	5.31×10^{-4}	$-1.79 * \times 10^{-2}$	9.40×10^{-4}	-2.23×10^{-5}
Equity Multiplier	−56.37	2.21	−1.25	−84.05	4.96	−1.08
Debt Equity Ratio	−3.60	9.23×10^{-2}	-5.7×10^{-2}	−5.62	0.29	−0.04
Agency Cost	-6.52×10^{-3}	4.75×10^{-4}	1.78×10^{-5}	-1.67×10^{-3}	8.94×10^{-5}	-1.36×10^{-5}
Size	1.25×10^{-3}	-8.43×10^{-5}	-1.61×10^{-6}	3.64×10^{-3}	-2.67×10^{-5}	4.44×10^{-6}
N	13,897	13,903	13,903	13,964	13,970	13,969
	MODEL	3		MODEL	4	
	Returns	ROA	ROE	Returns	ROA	ROE
Constant	55.09	−3.88	1.03	16.73	5.09	1.49
Cash from Debt-Funded Acquisition	−1.47 *	0.31	0.02			
Cash from Equity-Funded Acquisition				19.49	20.66	1.05
Investment in Acquisitions	−0.12	1.14×10^{-3}	-1.72×10^{-5}	-1.8×10^{-3}	2.50×10^{-3}	4.69×10^{-5}
Equity Multiplier	75.54	3.31	−1.67	−23.79	−10.71	−1.84

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, t statistics in parentheses.

5.3. Examination of a Size Effect

Is there a size effect for acquirers? If there was a size effect, large and small firms would vary in the influence of cash funding of acquisitions on security returns, return on assets, and return on equity. We do not find evidence of a size effect for acquisitions funded by cash holdings, cash flow, or cash proceeds from the issuance of debt. Results are described in the paragraphs below, rather than a table, to maintain brevity.

Cash Holdings: For the smallest firms, cash-funded acquisitions significantly increased security returns (Coefficient = 2.69×10^{-3}, $p < 0.001$) and return on assets (Coefficient = 9.67×10^{-5}, $p < 0.001$). Similar results were obtained for the largest firms, with significant increases in security returns (Coefficient = 3.01, $p < 0.001$) and return on assets (Coefficient = 1.42×10^{-4}, $p < 0.001$).

Cash Flow: Likewise, large and small firms showed similar effects on returns and return on assets for cash flow-funded acquisitions. For large firms, cash flow-funded acquisitions significantly increased security returns (Coefficient = 3.88×10^{-2}, $p < 0.001$) and return on assets

(Coefficient = 3.91×10^{-4}, $p < 0.01$). For small firms, cash flow-funded acquisitions significantly increased security returns (Coefficient = 1.79×10^{-2}, $p < 0.001$) and return on assets (Coefficient = $1.44 \times 10^{-4,}$, $p < 0.001$).

Cash Proceeds from Debt: For cash acquisitions funded by debt proceeds, the smallest firms showed significant returns on returns (Coefficient = 0.01, $p < 0.001$) and return on assets (Coefficient = 1.4×10^{-4}, $p < 0.001$). The largest firms also influence these outcomes significantly (Coefficient = 1×10^{-3}, $p < 0.001$, for returns) and (Coefficient = 1×10^{-3}, $p < 0.01$, for return on assets).

6. Discussion of Results

6.1. Results for Disruptive Strategies

Cash holdings and cash from debt proceeds increased stock returns for disruptors. The information signaling hypothesis was supported by the findings. The size of the source of cash determined the intensity and direction of the signal emitted. Cash holdings and cash from debt proceeds are large in size. With disruptions, which are growth opportunities, managers may use the considerable funds in cash holding and cash proceeds from debt to fund the additional cash needs of disruptions. As an example, Uber had significant regulatory challenges, such as the reclassification of drivers as employees. Such challenges required cash outlays to provide to provide legal protection. By making these investments, managers signaled to the markets that they believed in the new business model created by the disruptor. They felt that the disruption would increase shareholder wealth, hence, resulting in increased stock returns. Thus, results involving cash holdings and cash proceeds from debt support the information signaling hypothesis.

Conversely, cash flows for disruptors had a negative influence on security returns. Cash flows are generated from annual operating income, rendering them smaller than cash holdings and smaller than cash proceeds from debt. Cash flows are unlikely to provide the additional funding needed by disruptors to meet current expenses. This is particularly true for small firms with very limited cash flows to meet expenses. Consequently, disruptions may be viewed by managers making decisions to use cash flows as low growth opportunities. Agency costs may lead managers to make unproductive investments, such as Uber's foray into self-driving cars. These conditions are in accordance with the free cash flow hypothesis, which views excess cash as a signal of overinvestment in negative NPV projects, resulting in reductions in stock returns.

6.2. Results for Acquisitions

For acquirers, cash holdings, cash flows, and cash from debt proceeds predict increased stock returns and increased return on assets. Acquisitions are large. As an example, Coca Cola purchased a purified water firm, and Facebook bought Instagram. The acquisitions signal to the markets that managers believe that the target firms will increase the wealth of shareholders and increase the profits, measured by return on assets. A strong positive signal is communicated by cash holdings, cash flow, and cash from debt proceeds, in keeping with the information signaling hypothesis. Cash holdings and cash from debt proceeds are sufficiently large to support investments in the target, to permit the target to grow and prosper. Cash flows, as noted, are smaller. Yet, the signal of support from management may be sufficiently high to encourage the investment of cash flows in the target firm. Therefore, the positive impact on security returns from cash, cash flow, and cash proceeds from debt supports the information signaling hypothesis.

Unlike disruptions, cash holdings, cash flows, and cash proceeds from debt for acquisitions increase profits, in addition to security returns. Cash sources from disruptions, on the other hand, have no impact on profits. The underlying reason may be due to the ability of target firms to add to the profits of acquirers. Disruptors may be unprofitable for a considerable length of time. Both Airbnb and Uber took many years to generate a profit. The ability of disruptors to add to profits may not occur. Therefore, acquisitions transmit a positive signal about future profits, while disruptors fail to send such a signal. This is in keeping with the information signaling hypothesis.

For acquisitions, none of the cash sources showed positive effects on return on equity. All of them showed positive effects on return on assets. Return on equity is the profit return to the shareholders, based on their equity in the acquirer. Return on assets is a more comprehensive measure of profits, based on both returns to shareholders and creditors. Cash sources funding acquisitions send a positive signal about future profits to all stakeholders, not just shareholders. The information signal transmits a positive expectation about all future profits, suggesting that wealth increases by both equity holders and debt holders.

7. Conclusions

7.1. Disruptive Strategies

This paper has made an initial attempt to determine the effect of disruptive strategies on financial performance. We have brought the concept of disruption from the popular press into the academic literature. We feel that we are justified in taking this action, as disruptive strategies are becoming more commonplace, and the term itself is assuming the form of a buzzword in business. We have shown that the cash funding of disruptions can send a strong positive signal to the markets, resulting in positive returns. Yet, we are aware of the fact that this result was obtained by measuring cash balances and cash proceeds from debt, contemporaneously. The positive effects on returns occurred at the same point in time as the measurement of cash funding of disruptions. It is possible that results may differ if outcomes, such as returns, were measured one period following the designation of a strategy as disruptive. Future research must examine the effect of disruption on intermediate-term returns (3–4 years) and long-terms returns (5 years).

The ownership of cash transmits a strong positive signal. Intuitively, this is realistic, as a strong cash position provides the funds to take advantage of growth opportunities. It follows that cash holdings, as expected, increased security returns. Cash raised through debt proceeds are reserves to be held until growth opportunities become available. The availability of this cash for investments is in itself a form of revenue-enhancement. Yet, cash flows used to fund disruptions have a detrimental influence on security returns. In repeated analyses, we found that disruptions funded by cash flows emitted a negative signal to security returns. This may be due to cash balances and cash proceeds from debt being large. The signal that they transmit does not vary in direction. Cash flows, on the other hand, are smaller in magnitude, as they are obtained from current operations. The small size of cash flows may lead to varying effects on security returns. For large firms that own much property, depreciation tax shields will be large enough to generate positive signals. In contrast, firms that do not have much real estate will not benefit from depreciation tax shields, so that the tax shields may not offset declines in operating income, resulting in negative signals.

Disruptions do not have any impact on profitability. There was no significant influence of cash-funded disruptive strategies on measures of profitability, including return on assets and return on equity. It is possible that the effects of disruptions have an immediate impact on returns, with sharp upward or downward movements in stock prices, which are reflected in security returns. These signals do not influence the profitability of the firm, which are based on the earning of profits or net income. Future research must expand the list of profit measures to include operating margin and net margin, as these measures suggest that the new business models created by disruptions may significantly reduce expenses, increasing margins in the short-term. An example would be a ride-hailing firm, which does not have the high fixed costs of maintaining a fleet of taxis.

Disruptions did not show any size effects for cash holdings. Both large and small disruptors significantly increased security returns. However, for cash flow-funded disruptions, only small firms increased security returns. As mentioned, cash flows are smaller in magnitude than cash holdings, or cash proceeds from debt. Therefore, small amounts of cash may have a magnified effect on returns for small firms.

7.2. Acquirer Strategies

Cash-funded acquisitions transmitted positive signals to security returns and profitability measures, such as return on assets. Acquiring a firm with cash funding sends the positive signal that the firm has the large cash balances to be able to make sizable investments, such as acquiring another firm. Cash flows, although smaller in magnitude, reinforce the message of the firm having the ability to take advantage of growth opportunities, due to cash ownership. Profits are expected to increase, as the acquirer adds on a firm with new products, new services, and employees with skills that complement the skills of the existing labor force.

Size effects were absent, as both large and small acquirers benefitted from the positive signaling effect on returns and return on assets, and from the profit increases exhibited by increases in return on assets. This result was partly supported by Chay et al. (2015), who found a lack of size effects for both cash funding and cash flow funding of investments, from 1981–2010. In other words, both firms at low and high quintiles of investment employed cash funds. We have added to this finding as cash-funded acquisitions not only employed cash, but earned superior returns and profits, regardless of firm size. Could agency costs negate these positive effects? A separate analysis (not reported here) varied agency costs for the two-stage least squares regressions. Agency costs exerted a negative effect, but were ineffective in reversing the positive influence of cash funding of acquisitions, on both security returns and return on assets.

7.3. Support for the Pecking Order Theory

According to the pecking order theory, funding preferences are in the order of internal financing, followed by debt, followed by equity. The generalized theory does not differentiate among the types of growth opportunities pursued. We provide evidence that, for specific growth opportunities, such as growth by disruption and growth by acquisition, there is support for the pecking order sequence of funding. Cash balances, cash flow, and cash proceeds may support internal financing, followed by cash proceeds from debt issuance. There was no evidence of the use of cash proceeds from equity.

Future tests of the pecking order theory must examine the effect of cash funding. Existing literature (see Vassilou et al. 2009, for a review) does not isolate cash funding; rather, it is subsumed under other sources of funding, such as internal financing, or external funding as a proportion of investment capital. The true effects of choosing cash-funded growth can only be measured if such cash funding is clearly separated from other sources of funding.

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References

Abraham, Rebecca, Charles W. Harrington, and Albert A. Williams. 2011. Multimarket trading at merger announcement and completion. *Journal of Derivatives and Hedge Funds* 17: 186–97. [CrossRef]

Afrifa, Godfred Adjapong. 2016. Net working capital, cash flow, and performance of UK SMEs. *Review of Accounting and Finance* 15: 21–44. [CrossRef]

Ahn, Hyejin, Sunhwa Choi, and Sunho Chris Yun. 2020. Financial statement compatibility market value of cash holdings. *Accounting Horizons* 34: 1–21. [CrossRef]

Akhigbe, Aigbe, and T. Harikumar. 1995. A test of the control hypothesis of bond creation. *Journal of Business Finance and Accounting* 22: 867–80. [CrossRef]

Almajali, Amal Yassim, Sameer Ahmed Alamm, and Yahya Zakerea Al-Soub. 2012. Factors affecting the financial performance of Jordanian insurance companies listed on the Amman Stock Exchange. *Journal of Management Research* 4: 266–89. [CrossRef]

Anton, Sorin Gabriel, and Anca Elena Afloarei Nucu. 2019. Firm value and corporate cash holdings: Empirical evidence from Polish listed firms. *E+M Ekonomie a Management* 22: 121–33. [CrossRef]

Brickley, James A. 1983. Shareholders wealth, information signaling, and the specially designated dividend: An empirical study. *Journal of Financial Economics* 12: 18–209. [CrossRef]

Chan, Howard W., and Robert W. Faff. 2005. Asset pricing and the illiquidity premium. *Financial Review* 40: 429–58. [CrossRef]

Chauhan, Yogesh, and Rajesh Pathak. 2021. Does transparency affect corporate payout decisions? *International Journal of Managerial Finance* 17: 237–55. [CrossRef]

Chay, J. B., Soon Hong Park, Soojung Kim, and Jungwon Suh. 2015. Financing hierarchy: Evidence from quantile regression. *Journal of Corporate Finance* 33: 147–63. [CrossRef]
Chen, Sihong Siyan, and Kuei-Chin Fu. 2011. An examination of the free cash flow and information/signaling hypotheses using unexpected dividend changes: The case of regular dividend increases. *Review of Pacific Basin Financial Markets and Policies* 14: 563–600. [CrossRef]
Chirinko, Robert, and Anuja Singha. 2000. Testing static tradeoff against pecking order models of capital structure: A critical comment. *Journal of Financial Economics* 58: 412–85. [CrossRef]
Chu, Yongqiang, and Peng Liu. 2016. A direct test of the free cash flow hypothesis. *Journal of Real Estate Finance and Economics* 52: 543–58. [CrossRef]
Chung, Peter Y., Herbert Johnson, and Michael. J. Schill. 2006. Asset pricing when returns are non-normal: Fama-French factors in higher order co-moments. *Journal of Business* 79: 923–41. [CrossRef]
Cuong, Nguyen Thanli. 2019. Optimal cash holding ratio for non-financial firms in Vietnam Stock Exchange market. *Journal of Risk and Financial Management* 12: 104. [CrossRef]
Dimitripoulos, Panagiotis, Konstantinos Koronies, Alkis Thrassou, and Demetris Vrontis. 2020. Cash holdings, corporate performance, and viability of Greek SMEs: Implications for stakeholder relationship management. *EuroMed Journal of Business* 15: 333–48. [CrossRef]
Faulkender, Michael, and Ron Wang. 2006. Corporate financial policy and the value of cash. *Journal of Finance* 61: 1957–90. [CrossRef]
Fee, C. Edward, Joshua R. Pierce, Hoontack Seo, and Shan Yan. 2014. Bank debt, flexibility, and the use of proceeds from asset sales. *Journal of Financial Services Research* 46: 77–97. [CrossRef]
Fresard, Laurent. 2010. Financial strength, and product market behavior: The real effects of corporate cash holdings. *Journal of Finance* 55: 1097–122. [CrossRef]
Gilbert, Clark. 2003. The disruption opportunity. *MIT Sloan Management Review* 44: 27–32.
Gregory, Alan, and Yuan Hsin Wang. 2013. Cash acquirers: Can free cash flow, debt and institutional ownership explain long-run performance? *Review of Behavioral Finance* 5: 35–57. [CrossRef]
Harford, Jarrad. 1999. Corporate cash reserves and acquisitions. *Journal of Finance* 54: 1969–97. [CrossRef]
Harris, Milton, and Artur Raviv. 2017. Why do firms sit on cash? An asymmetric information approach. *Review of Corporate Finance Studies* 6: 141–73. [CrossRef]
Harvey, Campbell, and Akhtar Siddique. 2000. Conditional skewness in asset pricing. *Journal of Finance* 55: 1263–95. [CrossRef]
Healy, Paul M., and Krishna G. Palepu. 1988. Earnings information conveyed by dividend limitations and omissions. *Journal of Financial Economics* 21: 149–76. [CrossRef]
Huang, Ying, Susan Elkinawy, and Pankaj K. Jain. 2013. Investor protection and cash holding: Evidence from US cross listing. *Journal of Banking and Finance* 37: 937–51. [CrossRef]
Jabbouri, Imad, and Hamad Almustafa. 2021. Corporate cash holdings, firm performance, and national governance: Evidence from emerging markets. *International Journal of Managerial Finance* 17: 783–801. [CrossRef]
Jensen, Michael. C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76: 323–29.
Jensen, Tyler. K. 2022. Do funding conditions explain the relation between cash holdings and stock returns? *Journal of Financial and Quantitative Analysis* 57: 1174–203. [CrossRef]
Kroes, James R., and Andrew S. Manileas. 2014. Cash flow management and manufacturing firm financial performance: A longitudinal perspective. *International Journal of Production Economics* 148: 37–47. [CrossRef]
La Rocca, Maurizio, Raffaele Stagliano, Tiziana La Rocca, Alfio Cariola, and Ekaterina Skatova. 2019. Cash holdings and SME performance in Europe: The role of firm-specific and macroeconomic moderators. *Small Business Economics* 53: 1051–78. [CrossRef]
Leavy, Patricia. 2017. *Research Design: Quantitative, Qualitative, Mixed Methods, Arts-Based, Community-Based, Participatory Research Approaches*. New York: The Guilford Press.
Lie, Erik, and Ylxin Liu. 2018. Corporate cash holdings and acquisitions. *Financial Management* 47: 159–73. [CrossRef]
Miller, Merton, and Franco Modigliani. 1961. Dividend policy: Growth and the valuation of shares. *Journal of Business* 34: 411–33. [CrossRef]
Mitchell, Mark, Todd Pulvino, and Erik Stafford. 2004. Price pressure around mergers. *Journal of Finance* 59: 31–63. [CrossRef]
Myers, Stewart C. 1984. The capital structure puzzle. *Journal of Finance* 39: 575–92. [CrossRef]
Myers, Stewart C., and Nicholas S. Majluf. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13: 187–221. [CrossRef]
Okofo-Durtey, Emmanuel, and Farai Kwenda. 2021. The free cash flow hypothesis and M&A transactions by acquirers in emerging markets. *The Journal of Developing Areas* 55: 45–58.
Ozkan, Aydin, and Neslihan Ozkan. 2004. Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking and Finance* 28: 2103–34. [CrossRef]
Payne, A. Abigail. 2011. Measuring the effect of federal research funding on private donations at research universities: Is federal research funding more than a substitute for private donations? *International Tax and Public Finance* 8: 731–51. [CrossRef]
Pinkowitz, Lee, Rene Stulz, and Rohan Williamson. 2007. What is the market value of a dollar of corporate cash? *Journal of Applied Corporate Finance* 19: 74–81. [CrossRef]

Qiu, Jiaping, and Chi Wan. 2015. Technology spillovers and corporate cash holdings. *Journal of Financial Economics* 115: 558–73. [CrossRef]

Schweitzer, Bernhard, and Carsten Reimund. 2004. Valuation Effects of Corporate Cash Holding: Evidence from Germany. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=49026 (accessed on 20 January 2023).

Theoret, Raymond, and Francois-Eric Racicot. 2007. Specification errors in financial models of returns: An application to hedge funds. *The Journal of Wealth Management* 10: 74–86. [CrossRef]

Turki, Aymen. 2019. Dividend policy and stock acquisition announcement returns: A test of asymmetric information theory. *Journal of Financial Research* 42: 115–45. [CrossRef]

Vassilou, Dimitrios, Nikolaos Eriotis, and Nikolaos Daskalakis. 2009. Testing the pecking order theory: The importance of methodology. *Qualitative Research in Financial Markets* 2: 85–96. [CrossRef]

Walton, Debra. 2017. Technology Is Disrupting the Way People Earn, Save, and Spend. How Should Banks Respond? World Economic Forum. Available online: https://www.weforum.org/agenda/2017/01/technology-is-disrupting-finance-how-should-leaders-respond/ (accessed on 12 January 2017).