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The Impact of Monetary Policy on M&A Outcomes*

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Abstract

Monetary policy influences a wide range of Mergers and Acquisitions (M&A) outcomes. First, an increase in the federal funds rate predicts a negative market reaction to M&A announcements, an increase in the likelihood of deal withdrawal, and significant financing challenges for the acquirer in the post-acquisition phase. Second, M&As announced during periods of high monetary policy uncertainty are associated with significant declines in acquirer value. This negative market reaction reflects a unique discount to compensate for the high riskiness of M&As in an uncertain monetary environment. Finally, we show that monetary contraction, rather than monetary policy uncertainty, is a key contributor to the decline in aggregate M&A activity.

Keywords: Federal funds rate; Expected financing cost; Monetary policy uncertainty; Real options; Mergers and Acquisitions (M&As); Acquirer abnormal returns; M&A completions.

JEL classification: G12; G34; E52.

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1. Introduction

Monetary policy is widely understood to affect the cost of financing (Bernanke and Blinder, 1992; Jiménez et al., 2012) and the informational content of asset prices (Beaudry et al., 2001; Tommasi, 1994). In influencing the direction of the economy, monetary policymakers generally operate under few constraints and have a far-reaching impact compared to other policymakers (Taylor, 2000). For example, in the aftermath of the 2008 financial crisis, central banks engaged in unprecedented monetary expansions, significantly expanded their balance sheets, and lowered short term interest rates to zero for a considerable period of time, with very limited political resistance (Maggio and Kacperczyk, 2017). In addition, monetary policy can complicate resource allocation decisions, encourage risk-taking, and build hidden sources of risk that eventually raise financing challenges for investors (Beaudry et al., 2001; Jiménez et al., 2014; Maggio and Kacperczyk, 2017; Tommasi, 1994). Moreover, the decisions of monetary policymakers have different effects across regions (Carlino and DeFina, 1998) and sectors (Jansen et al., 2013), leading to significant consequences on the investment and financing opportunities available to firms.

As a result, monetary policy is unlikely to be ignored when corporate managers assess new investment opportunities and, in particular, when considering their involvement in Mergers and Acquisitions (M&As) transactions. Undoubtedly, M&As represent a major form of corporate investment, expansion, and restructuring that is valuation-complex, financially demanding, and informationally intense (Eckbo, 2009). Moreover, the synergies of M&As are highly dependent on the prevailing state of the overall economy, which is heavily influenced by monetary policy decisions (Galí and Gambetti, 2015; Summers, 2014).

Recent studies suggest that policy uncertainty incentivizes acquirers to be more prudent when designing M&As (Bonaime et al., 2018; Nguyen and Phan, 2017). Nevertheless, the direct impact of monetary policy conditions on (a) equity investors' assessment of the value potential of M&As, (b) the riskiness of such value potential, (c) the likelihood of M&A completion, and (d) the overall M&A synergies, remains to be thoroughly studied. Based on the analysis of a comprehensive sample covering 12,350 domestic U.S. public, private, and subsidiary target M&As announced between January 1986 and December 2017 – a period of considerable variation in monetary policy in the U.S. – we uncover two channels through which variations in monetary policy can influence M&A outcomes.

Our first channel is the "expected financing cost" channel. A well-established result in the monetary policy literature suggests that monetary tightening increases the cost of financing and reduces the viability of corporate investments (Bernanke and Blinder, 1992; Bougheas et al., 2006; Jiménez et al., 2012). Therefore, our "expected financing cost" channel predicts that tight monetary policy at the time of M&A announcements poses future financing challenges for merging firms (Beck et al., 2008; Ozkan, 2001). Given that M&As exhaust significant financial resources (Moeller et al., 2005), post-acquisition financing of future business operations becomes highly dependent on access to external financing. We therefore predict that, in a contractionary monetary environment, M&A announcements tend to be negatively perceived by equity investors, especially when acquirers are financially constrained at the time of M&A announcements. We also predict that acquirers investing significant resources in M&As during contractionary monetary periods experience an increase in their post-acquisition financing costs, a reduction in their cash reserves and an overall decline in their shareholder wealth.

We use two proxies to reflect the impact of monetary policy via the "expected financing cost" channel: (a) the level of federal funds rate (FFR), and (b) the deviation of FFR from the natural interest rate – as estimated by Laubach and Williams (2003).[1] Our tests show a negative relation between the FFR at the time of the M&A announcement and acquirer Cumulative Abnormal Returns (CAR). More specifically, a one percentage point increase in FFR (or in the deviation of FFR from the natural rate) in the quarter preceding the deal's announcement is, on average, associated with a 0.20% decrease in the acquirer CAR. We show that the FFR effect on acquirer CAR remains statistically and economically significant after controlling for the effects of financial market uncertainty using the VIX index as in Bhagwat et al. (2016) and overall uncertainty in the economy using the composite leading index estimated by the Federal Reserve Bank of Philadelphia. This negative market reaction is particularly driven by investors' concerns about a rise in future financing costs that the acquirer will potentially face in a contractionary monetary environment. Supporting this explanation, we find that the negative relationship between the level of FFR and the acquirer CAR is particularly evident in deals that are announced by highly leveraged acquirers as well as those having low cash ratios.

Furthermore, we show that the rise in FFR is a key predictor of the deterioration in the acquirer's post-acquisition performance: a one percentage point increase in FFR is associated with a 1.5% reduction in the acquirer's post-acquisition Return on Assets (RoA). A rise in FFR is also associated with an increase in the acquirer's indebtedness, a reduction in its cash (to assets) ratio and a rise in its cost of debt. We also show that deals announced during periods of monetary contraction are associated with a significant decline in the acquirer's post-acquisition Buy-and-Hold Abnormal Returns (BHAR).

[1] The measures are updated frequently on John Williams's Federal Reserve Bank of San Francisco webpage. This measure is derived from a frequently updated state space model in which the natural rate of interest is the state variable ensuring that the realized output is equal to its potential level while preserving price stability.

Our second monetary policy channel is a "real options" channel which assesses the impact of monetary policy uncertainty (MPU) on a wide range of M&A outcomes. The "real options" framework considers irreversible investments as equivalent to financial call options that can be either exercised or delayed at any point in time (Dixit and Pindyck, 1994; Kellog, 2014). As long as the investment is not undertaken, the firm holds a "wait and see" option as it awaits the arrival of new information to adjust its investment plans (Kelly, 1991). As in the case of financial option valuation, a rise in market uncertainty increases the value of the option to "wait and see". Other things being equal, rising MPU should encourage firms to delay major investments such as M&As (Bhagwat et al., 2016; Bonaime et al., 2018). This is especially due to the far-reaching influence of monetary policy on the economic environment in which merging firms aim to realize their synergies (Carlino and DeFina, 1998; Summers, 2014).[2]

Along these lines, acquirers that abandon the option to "wait and see" and proceed with an acquisition face significant business risk, and equity investors should demand a significant discount for holding the acquirers' shares. Our results support this proposition. We find that an increase in the MPU index developed by Baker et al. (2016) (hereafter BBD index) at the time of the deal's announcement is a significant predictor of the decrease in the acquirer CAR. In particular, a one standard deviation increase in the news-based MPU index of Baker et al. (2016) at the time of the deal's announcement is, on average, associated with a 0.40% decline in the acquirer CAR. We also find that deals announced under high MPU tend to cause higher volatility in the acquirer returns than

[2] Beaudry et al. (2001) and Tommasi (1994) argue that price instability adversely affects the allocation of investments through a depreciating effect on the informational content of asset prices. High MPU is expected to distort price signals in asset markets, make investment opportunities difficult to forecast, and ultimately lead to misallocation of investments (similarly to Beaudry et al., 2001). This is also likely to defer investments at a future date. We embed this result in the market for corporate control. We argue that price instability triggered by high MPU limits the acquirer's ability to accurately forecast and evaluate takeover synergies and, hence, M&As announced within high MPU environments should be value-destroying for acquirers, at least in the short run.

deals announced under low MPU. Nevertheless, in line with the traditional risk-return paradigm, we find that acquirers manage to overcome these challenges to deliver significant gains in the post-acquisition period. This result supports the view that MPU and its related risks are short-lived (Byrne and Davis, 2004) and do not deter companies from attempting to engage in value-enhancing investment (Kang et al., 2014).

We also investigate the extent to which monetary policy considerations influence both the premium and the choice of contractual tools used in M&As. Specifically, we find that high MPU reduces the bargaining power of the acquirer and consequently results in an increase in the takeover premium. Moreover, high MPU during the due diligence period reduces the target's commitment to the deal, as evidenced by the limited inclusion of target termination fee provisions. This result is aligned with the influential body of literature suggesting that the inclusion (absence) of a termination fee provision reflects a weak (strong) bargaining position for the target firm (Bates and Lemmon, 2003; Boone and Mulherin, 2007; Officer, 2003).[3] Our results further show that a tight monetary policy – because it raises concerns about the acquirer's future financing and liquidity positions – reduces the likelihood of the use of deferred (or earnout) payments (Barbopoulos and Adra, 2016; Datar et al., 2001; Kohers and Ang, 2000).

Our results highlighting the significant impact of FFR on M&A outcomes are highly consequential from the perspectives of both policymakers and scholars interested in the monetary policy's transmission channels. A growing strand of studies examines how monetary transmission mechanisms can operate via the corporate financing and investment decisions (Bolton and Freixas, 2006; Grosse-Rueschkamp et al., 2019; Liu et al., 2018). Our M&A-based findings add a new corporate channel via which monetary

[3] It is worth noting that the literature focused on the wealth effects of termination fee provisions in M&As does not examine the influence of policy uncertainty on the use of such contractual tools.

policy influences economic activity. Given that the size of the recent merger wave is equivalent to almost 15% of the annual U.S. Gross Domestic Product (Alexandridis et al., 2017), the direct impact of monetary policy decisions on the market for corporate control should not be overlooked by monetary policymakers. Another direct implication of our "expected financing cost" channel is that corporations, especially those in disadvantageous leverage and liquidity positions, must display prudence when engaging in M&As in a contractionary monetary environment.

To the best of our knowledge, this paper provides the first direct examination of the link between MPU at the time of the deal announcement and the wealth effects of M&As. It is worth noting that the size of the MPU discount is generally unique: there is no equivalent discount associated with the uncertainties related to fiscal, regulatory, and trade policies, among others. This uniqueness emphasizes the relevance of MPU as a distinctive and influential source of corporate risk, beyond the challenges posed by general policy concerns.

Prior studies provide alternative conclusions. Bonaime et al. (2018) report a univariate analysis suggesting that the acquirer announcement period CAR does not differ between high and low policy uncertainty periods. By contrast, Nguyen and Phan (2017) report multivariate evidence suggesting that high policy uncertainty in the period leading to the acquisition announcement incentivizes acquirers to proceed with only value-enhancing acquisitions. In their online appendix, they also show that part of the BBD index that is based on the level of disagreement in the forecasts of government spending and Consumer Price Index (CPI), which Baker et al. (2016) attribute to the uncertainty surrounding fiscal and monetary policies, is a significant predictor of the rise in the acquirer CAR.

Our paper differs from Nguyen and Phan (2017) in two key aspects. First, instead of focusing on the aggregate BBD index that combines fiscal and monetary uncertainties, our empirical analysis focuses on the news-based index that exclusively reflects monetary policy concerns. This direct approach is relevant as Boero et al. (2008) – and subsequently Rich and Tracy (2010) – cast doubts on the usefulness of CPI forecast disagreements in reflecting MPU.

Second, our analysis separates MPU during the period leading to the deal's announcement from the level of MPU prevailing at the time of this announcement. Our findings add a new dimension by showing that, despite the acquirers' prudence in assessing their deals' prospects in the face of uncertainty, the prevalence of MPU at the time of the deal's announcement makes equity investors highly cautious in assessing the M&A prospects. This finding testifies to the relevant and unique influence of monetary policy.

The final part of the paper applies a time series analysis of the impact of monetary policy on the aggregate M&A activity. Both Kang et al. (2014) and Gulen and Ion (2016) find no effect of the BBD index component that combines monetary and fiscal uncertainties on corporate investment. Our results support these findings in the realm of M&A by showing that it is general policy uncertainty, rather than MPU per se, that contributes to the decline in M&A activity. Nevertheless, a tight monetary policy – by increasing the cost of investment financing (Bernanke and Gertler, 1995; Bernanke and Blinder, 1992; Jiménez et al., 2012; Kashyap et al., 1993) and reducing the aggregate economic output (Bernanke and Blinder, 1992; Romer and Romer, 1989) – reduces the value prospect of M&As. Our VAR model shows that FFR is a significant contributor to the decline in aggregate M&A activity after controlling for the prevailing level of MPU and a wide range of economic factors. Moreover, the impulse response analysis suggests that a

rise in FFR predicts a decline in the aggregate value of announced M&As for the following five quarters.

This result has direct implications for the body of research that focuses on the determinants of aggregate M&A activity (Harford, 2005; Maksimovic et al., 2013; Rhodes–Kropf and Viswanathan, 2004; Shleifer and Vishny, 2003). While prior research focuses on the role of stock market valuations, technological shocks, and regulatory factors in influencing M&A activity, our results are the first to emphasize the influential role of the variation of FFR. In so doing, our results establish a novel link between two rich – yet mostly non-overlapping – areas of study that focus on M&As and monetary policy, respectively.

The paper proceeds as follows: Section 2 describes the M&A dataset, as well as the proxies we use to capture the stance of the monetary policy; Section 3 presents our results from the univariate and multivariate tests; Section 4 presents results from our time series analysis; and finally, Section 5 provides a conclusion.

2. Data and Descriptive Statistics

2.1. The M&A dataset

Our M&A dataset covers 12,350 U.S. public, private, and subsidiary target acquisitions announced by U.S. public companies between January 1, 1986 and December 31, 2017, and recorded by the Thomson ONE Securities Data Corporation (SDC) database. As in Adra and Barbopoulos (2018), our analysis is executed on domestic deals in order to ensure that both merging firms operate within the same economic, legal, and institutional frameworks. Leveraged buyouts, government-funded takeovers, acquisitions of government entities, going-private deals, spinoffs, privatizations, self-tenders, and reverse takeovers are excluded from the sample. As in prior studies

(Alexandridis et al., 2013; Barbopoulos et al., 2018), we require the acquirer to own less than 10% of the target shares before the acquisition announcement and to aim to control more than 50% of the target shares after the deal's completion. We keep only deals with transaction values, excluding fees, in excess of $1m, as well as acquirers with market capitalization (available from COMPUSTAT and CRSP) in excess of $1m. We also exclude deals announced by the same acquirer within a five-day window. Finally, we impose the restriction that the method of payment (stock, cash, a combo of cash and stock, or alternative payment arrangements) is available in SDC.

Table 1 presents the annual distribution of all M&As, which is further divided according to the target firm's listing status, deal's completion status, and deal's payment method, as well as acquirer and target industry relatedness. The overall M&A activity follows a pro-cyclical pattern, with notable peaks in the late 1980s and late 1990s, as well as in the mid-2000s, in addition to significant declines in the aftermath of the dotcom bubble and the 2008 financial crisis. In our sample, 12% of the deals are withdrawn, which is comparable to the corresponding statistics reported in prior studies (Kau et al., 2008; Luo, 2005). More than half of our deals are private target acquisitions, with the remaining ones evenly split between public and subsidiary targets. Moreover, 41% of the deals are settled in mixed payments of cash and stock, while the deals fully settled in cash and in stock represent 32% and 27% of the sample, respectively. Sector-wise, untabulated statistics show that the hi-tech sector has the biggest share of deals (21%), while the real estate sector represents only 1% of all M&As. Finally, 37% (63%) of the deals are industry diversifying (focused).

(Insert Table 1 about here)

2.2. The interest rate dataset

We use two proxies to reflect the impact of monetary policy on M&A outcomes via the expected financing cost channel: (a) the Federal Funds Rate (FFR) and (b) the deviation of FFR from the "natural rate of interest" – as measured by Laubach and Williams (2003).

Building on the seminal work by Bernanke and Blinder (1992), FFR has become the most widely used measure of monetary policy's stance. We follow the convention of treating variations in the policy-set funds rate as an indicator of the variation in the monetary policy's stance. For each deal, the level of the FFR in the quarter preceding the deal's announcement is used as a proxy for the monetary policy's direction.

We use the interest rate variable developed by Laubach and Williams (2003) as a proxy for the natural interest rate. The method used in estimating this variable is based on the traditional view of Wicksell that "there is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them" (Wicksell, 1936, p.36). Accordingly, the estimates of the natural rate in Laubach and Williams (2003) are the result of a simple – yet robust – state space model in which the deviation of the policy-set rate from the natural rate is a key contributor to the variation in the output gap. Laubach and Williams (2003) model the dynamics of inflation and output within a restricted VAR by jointly estimating an "unobservable" natural interest rate, potential output, and trend growth rate series. Their model explains the variations in the output gap and the inflation rate in terms of the lagged effects of these state variables using both the Kalman filter and the Stock and Watson (1998) median-unbiased estimator. The advantage of their methodology is that it does not involve a priori theoretical models or structural equations while, at the same time, allowing for a time-varying natural rate which can be used in the assessment of policy rules. The authors

provide both one-sided and two-sided estimates of the natural rate. The one-sided estimates at time t are based solely on information available at time t without using data from subsequent periods. The two-sided estimates, however, are generated by a two-sided filter that uses data from both before and after time t to compute expected values of the natural rate.

Figure 1 shows the variation in the policy-set FFR and the two-sided smoothed estimate of the natural interest rate. For the period between 1961 and the end of 2001, the graph depicts the same variations discussed in Laubach and Williams (2003). This graph highlights key periods of relatively easy monetary policy in the early 1960s, monetary tightening to combat inflationary pressures in the 1970s and early 1980s, and limited monetary easing in the mid-1990s. Figure 1 also depicts a considerable degree of monetary easing in the early 2000s, which is in line with the widely held view that monetary policy was excessively loose after the burst of the dotcom bubble.

(Insert Figure 1 about here)

Moreover, Figure 1 shows that both the natural and the policy-set rates have been downward sloping up to the point where they have converged at substantially low rates. This noticeable decline is treated as an indicator of a dramatic change in macroeconomic environment, as a zero lower bound prevents monetary policy from achieving its objectives and raises the necessity for demand-driven policies. Furthermore, low interest rates with low inflation incentivize investors to take riskier and more financially destabilizing positions (Summers, 2014).

In our analysis, we use the difference between FFR and the two-sided smoothed natural interest rate as a measure of the monetary policy's stance. This approach provides a new interpretation for monetary shocks. A positive (negative) difference indicates the presence of an excessively expansionary (contractionary) monetary policy.

2.3. Monetary policy uncertainty (MPU)

In estimating the impact of policy uncertainty on investment decisions, previous research (Bonaime et al., 2018; Gulen and Ion, 2016; Kang et al., 2014; Nguyen and Phan, 2017) employs the BBD index developed by Baker et al. (2016). This index is the normalized weighted average of three components: (a) a scaled news-based factor constructed using the number of news articles containing uncertainty-related keywords (such as "uncertain," "White House," "Congress," and "Regulation"), (b) a measure based on the discounted value of the revenue impacts associated with tax provisions set to expire in the near future, and (c) an estimate of the dispersion in economic forecasts related to government spending and the Consumer Price Index (CPI). Baker et al. (2016) attribute the variation in the latter component to the uncertainty driven by concerns related to fiscal and monetary policies.[4]

Baker et al. (2016) also construct a rich set of news-based indices that directly quantify the level of uncertainty associated with each policy category. For instance, the categorical index used as a direct proxy for MPU is based on the frequency of keywords such as "federal reserve," "the fed," "open market operations," and "quantitative easing" used in the Access World News database, which covers over 2,000 U.S. newspapers. Similarly, the categorical news-based index used as a direct proxy of fiscal policy uncertainty is constructed by tracking the mentions of terms such as "government spending," "federal budget," "budget battle," "balanced budget," and "fiscal stimulus." In addition to monetary and fiscal policy uncertainty subcategories, Baker et al. (2016) construct news-based indices for taxes/government spending, healthcare, national security, entitlement programs, regulation, financial regulation, trade policy, sovereign

[4] In calculating the aggregate policy uncertainty index, the first component is assigned a weight of 1/2, the second component is assigned a weight of 1/6, and the third component is assigned a weight of 1/3.

debt, and currency crises. Each categorical series is normalized to have a mean of 100. The reader can consult Baker et al. (2016) and the website (http://www.policyuncertainty.com/) for a detailed description of the construction of each of these indices.

Figure 2 presents the time variation in the general policy uncertainty index of Baker et al. (2016) and the news-based monetary policy index, both available on the webpage (www.policyuncertainty.com). Despite the predictable positive correlation between these two indices, Figure 2 shows that MPU experienced a significant spike compared to general policy uncertainty during the period following the October 1987 stock market crash. Closer patterns are also present in the aftermath of the dot com bubble. Moreover, while MPU stabilized between 2011 and 2013 as the Federal Reserve clarified its response to the financial crisis, general policy uncertainty reached an all-time high. Baker et al. (2016) attribute the spike in the latter uncertainty to events such as the fiscal cliff dispute, the debt ceiling debate, and the U.S. government shutdown.

(Insert Figure 2 about here)

In assessing the impact of policy uncertainty on M&A outcomes, previous research uses the policy uncertainty levels for an extended period preceding an acquisition's announcement. In their analysis of the effect of policy uncertainty on the acquirer CAR, Nguyen and Phan (2017) use the average level of the BBD index for the three calendar months at the end of the calendar year preceding the announcement of the M&A. In their robustness checks, they also include the average level of the policy uncertainty index for the three months preceding an acquisition's announcement. However, it is important to note that the level of MPU varies significantly in the short term (Byrne and Davis, 2004).

Given that our analysis aims to uncover the impact of MPU at the time of the deal's announcement on M&A outcomes - including the acquirer announcement period CAR -

we construct the variable "Announcement MPU". If the deal is announced after (before) the 15th of a given calendar month, the "Announcement MPU" variable is assigned the value of the BBD news-based MPU index for the same (previous) calendar month. This approach ensures that our analysis controls for the effect of MPU on the market's reaction to a deal's announcement in a timely fashion. It is worth noting that our results do not change qualitatively or quantitatively if either the 10th or 20th day of the month is used as the cut-off date.

To ensure that our analysis controls for the effect of the MPU on the design and structuring of the deal, we also construct the variable "Pre-Announcement MPU" which is the average level of the news-based MPU index from 12 to 2 months before the acquisition announcement.

2.4. Descriptive statistics

Table 2 presents the descriptive statistics of the variables entering our cross-sectional tests. Appendix 1 provides a detailed description of each of the variables. We report the mean and median levels for each of the variables, as well as their 25th and 75th percentiles. Moreover, we report the mean level for each variable during periods of high MPU and low MPU, as well as differentials between both means. We consider deals to be subject to high (low) MPU when the level of the variable "Announcement MPU" is higher (lower) than its median level in our sample. Similarly, given that the median annual change in FFR in our sample is zero, we consider deals announced at a time when this variable is higher (lower) than this median to be subject to monetary contraction (expansion).

(Insert Table 2 about here)

The results provide several key insights. First, acquirers in deals announced during periods of high MPU are smaller and have higher book-to-market valuation compared to acquirers of deals announced during periods of low MPU. Second, deals announced under high MPU are considerably smaller than deals announced under low MPU. Interestingly, equivalent differences in both acquirer and deal size are present between deals announced under monetary contraction versus monetary expansion. Moreover, in the spirit of Bonaime et al. (2018), this result supports the notion that acquirers with high market valuations, and hence more takeover opportunities, limit their involvement in the takeover market to relatively small deals during periods of high MPU.

The descriptive statistics also suggest that acquirers differ between periods of monetary contraction and monetary expansion in terms of their cash and leverage ratios. More specifically, acquirers in periods of monetary contraction have lower indebtedness and higher cash ratios than acquirers in periods of monetary expansion. Additionally, acquirers under monetary expansion seem to experience noticeable relative declines in the level of net interest payment to total liabilities. This result provides some support to the view that monetary policy directly affects the acquirer's cost of financing in the post-acquisition period.

In our multivariate tests later in the paper, we put more emphasis on the role of the acquirer's pre-acquisition financial position in influencing various M&A outcomes. Moreover, the changes in deal- and firm-specific characteristics between periods of high and low MPU – and periods of monetary contraction and expansion – raise the requirement to apply a matching-based strategy to ensure that the differences in observable factors do not affect our inferences.

3. Results and Discussion

3.1. Univariate tests

Table 3 presents results from our univariate tests on acquirer CAR. We group deals according to the change of FFR (contractionary as a positive change of FFR in the current quarter relative to the previous quarter vs. expansionary as a negative change of FFR during the same period) and the extent of MPU (low when the MPU is below the median level vs. high when the MPU is above the median level). For each of the days in the five-day window ($t-2$ to $t+2$) surrounding the M&A announcement day ($t=0$), we estimate the abnormal returns as:

$$AR_{i,t} = R_{i,t} - E\left(R_{i,t}\right) \tag{1}$$

where: $AR_{i,t}$, is the abnormal return to acquirer i at day t, $R_{i,t}$ is the stock return of acquirer i, and $E\left(R_{i,t}\right)$ is the expected return of acquiring firm i on the same day. The expected returns are estimated using the Fama and French (1996) three-factor model (3FF) as in Equation (2) below:

$$E\left(R_{i,t}\right) = \left(1-\hat{\beta}_i\right)R_{f,t} + \hat{\beta}_i E\left(R_{m,t}\right) + \hat{\beta}_i^{smb}E(SMB_t) + \hat{\beta}_i^{hml}E(HML_t) \tag{2}$$

The parameters $\hat{\beta}_i$, $\hat{\beta}_i^{smb}$, and $\hat{\beta}_i^{hml}$ are estimated over days $t-250$ to $t-20$.

$$\left(R_i - R_f\right)_t = \alpha + \beta_i\left(R_m - R_f\right)_t + \beta_i^{smb}SMB_t + \beta_i^{hml}HML_t + \varepsilon_{i,t} \tag{3}$$

The announcement period cumulative abnormal returns (CAR_i) for acquirer i is estimated as the sum of the risk-adjusted returns over the five-day window ($t-2$ to $t+2$) surrounding the M&A announcement day ($t=0$), as outlined in Equation (4) below:

$$CAR_i = \sum_{t-2}^{t+2} AR_{i,t} \tag{4}$$

Panel A reports the effect of expansionary vs. contractionary monetary policy on the acquirer CAR. Acquirers in deals announced in the aftermath of monetary contractions

(i.e. an increase in FFR from the previous year) are associated with CAR that is 0.79% lower than the equivalent CAR in deals announced in the aftermath of monetary expansion (i.e. a decrease in FFR from the previous year). Unreported results show that this decline in acquirer CAR is driven by acquisitions of private (difference of -0.62%) and subsidiary target firms (difference of -1.81%) rather than by acquisitions of public target firms (difference of -0.15%). Previous research emphasizes the valuation difficulties associated with unlisted (private and subsidiary) target M&As due to the target firm's opaque financial environment (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2001). This result provides initial support to the view that equity investors consider deals announced under monetary contraction to be poorly timed with significant valuation difficulties. Further multivariate analysis will examine how both acquirer CAR and various post-acquisition performance- and financing-related variables are influenced by the monetary policy's stance.[5]

(Insert Table 3 about here)

Equally important evidence is presented in support of the "real options" channel. Panel B provides results from univariate tests of the acquirer CAR in periods of low vs. high MPU. Deals announced during a month where the MPU is higher (lower) than the median announcement period MPU in our sample are classified in the high (low) MPU group. Our results show that M&As announced during periods of high MPU reduce value creation in the short run. In particular, acquirers in deals announced during periods of high MPU experience 0.49% significantly lower CAR relative to deals announced during

[5] Unreported results further show that the lower acquirer CAR from M&As announced during contractionary monetary policy periods, relative to expansionary ones, is driven by mixed-settled acquisitions (difference of -1.08%). We justify this based on results uncovering a strong association between monetary tightening and acquirer CAR, which is more pronounced in relatively large acquisitions. Equity investors are cautious in their assessment of relatively large deals, which are documented by Boone et al. (2014) to be highly likely to be settled in mixed payments during periods of monetary tightening. Overall, the "expected financing cost" channel is supported through our univariate tests, suggesting that M&As announced during periods of contractionary monetary policy tend to be value-destroying (significant at the 1% level), relative to M&As announced during periods of expansionary monetary policy.

periods of low MPU. In the following subsection, we refine this initial univariate evidence by examining how MPU influences the likelihood of deal withdrawal, the riskiness of the acquirer's returns, and the post-acquisition shareholder value.

3.2. Multivariate analysis

3.2.1. The "expected financing cost" channel

The key prediction of the "expected financing cost" channel is that a rise in the policy-set interest rate predicts significant future financing challenges for the acquirer. These concerns manifest in a negative market reaction to the acquirer CAR upon the deal's announcement. To assess the impact of the monetary policy's direction on the acquirer's CAR, we report eight models in Table 4. We include the FFR and the deviation of FFR from the natural rate as separate proxies for the direction of monetary policy. The models have different specifications and are estimated on samples of different sizes. Models (1) and (2) are baseline specifications in which we exclusively control for firm- and deal-specific factors in addition to industry effects. Model (3) controls for the effect of the overall market volatility, as in Bhagwat et al. (2016), and the overall uncertainty related to the economic activity, which is represented by the value of the U.S. leading index. The latter variable is estimated by the Federal Reserve Bank of Philadelphia via a Vector Autoregression model that predicts the future values of the U.S. coincident indicators. The VAR model includes variables such as state-level housing permits (1 to 4 units), state initial unemployment insurance claims, delivery times from the Institute for Supply Management (ISM) manufacturing survey, and the interest rate spread between the 10-year Treasury bond and the 3-month Treasury bill. The sample in this model is limited to the post-1990 period to ensure the availability of the VIX index values. Model (4) is a more comprehensive specification as it includes variables reflecting the acquirer pre-

acquisition performance, leverage, and cash ratios. Appendix 1 provides a detailed description of all variables.

Models (1) to (4) in Table 4 show that the annual rise in FFR in the quarter preceding the acquisition's announcement predicts a decline in acquirer CAR. Put simply, a one percentage point increase in FFR is, on average, associated with around a 0.15% decline in acquirer CAR. Similarly, a one percentage point increase in the deviation of FFR from its natural rate is, on average, associated with a 0.25% decline in acquirer CAR. Models (5) to (8) further show that the impact of FFR on acquirer CAR is more pronounced in M&As announced during periods of monetary contraction, rather than monetary expansion. Moreover, despite the deviation of FFR from its natural rate being significant in both periods, it is worth noting that the negative effect during monetary contraction is twice as large as its equivalent under monetary expansion.[6]

(Insert Table 4 about here)

To support the proposition that the negative effect of FFR on acquirer CAR is driven by concerns about financing and liquidity challenges, we examine how the relation between FFR and CAR varies under different leverage and liquidity regimes. We expect the negative influence of monetary tightening on acquirer CAR to be more pronounced in M&As where the acquirer has a (a) high level of leverage, and (b) low cash ratio, before the acquisition. Evidence from Table 5 supports this prediction. More specifically, the effects of FFR and the deviations of FFR from the natural rate are statistically significant

[6] An anonymous reviewer highlighted the importance of controlling for the impact of financial advisors in the deal. We re-estimate our models on the subsample of deals for which advisor information is available in SDC (4,832 observations) and control for the presence of a top-tier advisor in the deal. The key additional independent variable is assigned the value of 1 if the acquirer's advisors include any of the following companies: Goldman Sachs, Merrill Lynch (now Bank of America Merrill Lynch), Morgan Stanley, JP Morgan, Citi/Salomon Smith Barney, Credit Suisse First Boston, Lehman Brothers (now Barclays Capital), and Lazard, and 0 otherwise. The advisors are labelled as Top-Tier by Golubov et al. (2012) based on their market share of takeover deals. We find that the presence of these advisors adds, on average, 1.30% additional acquirer CAR. More importantly, our results related to the effect of monetary policy on the acquirer CAR remain unchanged.

only for companies that are highly leveraged (in Models (1) and (2) compared to Models (3) and (4)). When we divide the deals according to the acquirer's pre-acquisition cash ratios, we also find that the effects of FFR and its deviation from the natural rate on the acquirer CAR are statistically significant only for acquirers with low pre-acquisition cash ratios (Models (5) and (6) compared to Models (7) and (8)). It is also worth noting that our results are consistent if the top (bottom) 30% of deals are used to classify acquirers under high (low) debt and cash ratios.[7]

(Insert Table 5 about here)

We provide further support to our proposition that the negative effect of FFR on acquirer CAR reflects the market's view about the acquirer's post-acquisition financing and liquidity challenges. We examine the effects of FFR (and its deviation from the natural rate) on a wide range of post-acquisition outcomes in Table 6. According to the "expected financing cost" channel, M&As announced under high levels of FFR should lead to a deterioration in the acquirer's post-acquisition performance, a rise in stock riskiness, an increase in indebtedness, a reduction in cash reserves, and an increase in the cost of servicing debts. All these propositions are strongly supported in the models reported in Table 6.

(Insert Table 6 about here)

In particular, evidence from Models (1) and (2) (Panel A) suggests that a one percentage point increase in FFR or its deviation from the natural rate is, on average, associated with a 1.30% to 1.70% decline in the rate of change in the acquirer's RoA in the year following the acquisition's announcement. The evidence from Models (3) and (4)

[7] The comments raised by an anonymous reviewer help us provide a complementary explanation for this result. In particular, hedging against interest rate movements is costly for acquirers that are highly leveraged and/or in weak liquidity positions. These constraints to hedging against interest rate risk intensify the market's concerns about the deal's prospects and are consequently reflected in lower announcement period acquirer CAR.

(Panel A), in turn, suggests that the rise in FFR and its deviation from the natural rate increase the difference in the level of acquirer indebtedness to total assets after the acquisition. To highlight the economic magnitude of this effect, it is worth noting that M&As announced during periods where FFR is at its 90th percentile in our sample are associated with a 4% increase in their debt ratios compared to deals in the 10th percentile of FFR. Unreported results also suggest that this effect is larger (6%) for deals in which the deal value is more than half of the acquirer's pre-acquisition market valuation.

Models (5) and (6) (Panel A) successfully highlight the significant negative impact of monetary contraction on the acquirer's cash ratios. More precisely, the decline in the acquirer's cash ratio in response to M&As announced during periods where FFR is at its 90th percentile in our sample is 25% larger than the decline in the acquirer's cash ratio for deals announced when FFR is at its 10th percentile. Models (7) and (8) (Panel A) further support the view that monetary tightening increases the acquirer's cost of financing in the post-acquisition phase. Specifically, both FFR and its deviation from the natural rate are significant predictors of the increases in the difference between the value of net interest payments to total debt after the acquisition's announcement compared to its level in the calendar year preceding the acquisition. Models (9) and (10) (Panel A) (Table 6) further highlight the contribution of monetary tightening to the increases in the level of risk that the acquirer faces in the post-acquisition period.

Put together, the deterioration in accounting performance, rise in debt and its cost, deterioration in liquidity, and the increased level of risk testify to the highly consequential impact of the monetary policy's direction on the outcomes in the market for corporate control. Given the considerable size of the M&A market and its consequential impact on employment, technological innovations, and financial markets,

our findings highlight an important monetary transmission channel that policymakers need to be cognizant of.

Results reported in Panels B and C (Table 6) show that the deterioration in RoA and the increase in debt and stock riskiness can be avoided by acquirers who ensure an early cancellation of the deal. In particular, the negative impact of FFR on RoA and the positive effects of FFR on the change in the debt levels and stock riskiness become insignificant in cases when the deal is withdrawn within less than a quarter after its announcement (Panel B). In contrast, these effects are highly significant in cases when the deal is either completed or cancelled in later stages.

The evidence reported in Table 7 reflects the impact of FFR and its deviation from the natural rate on a deal's likelihood of withdrawal. In a nutshell, our results suggest that the challenges arising from a contractionary monetary policy incentivize acquirers to withdraw the deal. In particular, the rise in both FFR (Models (1) and (3)) and the deviation of FFR from the natural rate (Models (2) and (4)) significantly predict a higher likelihood of deal withdrawal. This predictive effect holds after controlling for a wide range of firm- and deal-related factors, in addition to the levels of overall economic and financial market uncertainties using the value of the Leading Index and the VIX, respectively. To the best of our knowledge, these results are the first to extend the literature on the determinants of deal withdrawal (Kau et al., 2008; Luo, 2005) by focusing on the critical role of monetary policy.

(Insert Table 7 about here)

3.2.2. The "real options" channel

The "real options" channel predicts that acquirers engaging in M&As during periods of high MPU, and thus exercising the "wait and see" option, expose themselves to an

additional source of risk, at least in the short run. The evidence reported in Table 4 (Models (1) to (4)) supports this key prediction: a one standard deviation increase in the news-based MPU index of Baker et al. (2016) at the time of the deal's announcement is, on average, associated with a 0.40% decline in the acquirer CAR.[8] As discussed in Section 1, this evidence is quite distinct from the results reported in previous studies (Bonaime et al., 2018; Nguyen and Phan, 2017), mainly because the MPU index that we use is (a) news-based rather than driven by CPI and government spending projections, and (b) focused on the month of the deal's announcement independently from the extended period of pre-acquisition due diligence.

Interestingly, evidence from Models (5) to (8) (Table 4) suggests that the negative effect of MPU on acquirer CAR is particularly focused in periods of monetary expansion rather than monetary contraction. The exclusive presence of the MPU discount under monetary expansion, to a large extent, complements the results of Maggio and Kacperczyk (2017). Given that expansionary monetary policy incentivizes companies to invest in highly risky projects that are likely to cause significant losses if interest rates increase (Maggio and Kacperczyk, 2017), equity investors seem to display high caution in reacting to M&As in an uncertain monetary environment in which interest rates might increase in the near future.

The overall evidence from Tables 6 and 7 supports the general view that the challenges arising from MPU are relatively manageable by acquirers. In line with the risk-based explanation, the evidence reported in Models (9) and (10) (Table 6) suggests that a rise in the announcement period MPU increases the average riskiness of the acquirer's

[8] An anonymous reviewer recommended further detailed examination of the direction in MPU rather than the level of the MPU index. Hence, in alternative estimations, we include the change in the MPU (ΔMPU) as an independent variable. This variable is estimated as the difference between "Announcement MPU" and "Pre-Announcement MPU". The effect of this variable on the acquirer CAR is found to be negative, statistically significant, and economically close to the negative effect of the "Announcement MPU" on the acquirer CAR. These results are available from the authors upon request. We thank an anonymous reviewer for this suggestion.

shares in the period following the acquisition's announcement compared to the level of pre-acquisition risk. When it comes to the influence of MPU on the likelihood of deal withdrawal, Table 7 provides initial evidence (Models (1) and (2)) suggesting that the rise in MPU predicts an increase in the likelihood of deal withdrawal. However, this effect fades after controlling for the levels of financial market uncertainty using the VIX index and the level of overall economic uncertainty (Models (3) and (4)).

3.2.3. Propensity score matching and buy-and-hold returns

We apply the Propensity Score Matching (PSM) method (Dehejia and Wahba, 2002; Rosenbaum and Rubin, 1985, 1984; Smith and Todd, 2005) to examine whether our results related to the wealth effects of the monetary policy's stance are driven by observable characteristics. In the spirit of Alexandridis et al. (2017), we use the propensity scores estimated via a Logit model to produce close matches of deals announced under monetary contraction to deals announced under monetary expansion.[9] On the matched sample, we estimate the Average Treatment Effect on the Treated (*ATT*).

In Table 8, we present the results of our PSM analysis. The dependent variable in our Logit model (Panel A) is assigned the value of one if FFR increased on a yearly basis in the quarter preceding the acquisition announcement, and zero otherwise. We use the propensity score estimates from the Logit model to match treated observations (deals under monetary contraction) to control ones using a caliper of 0.001. In line with Dehejia and Wahba (2002), we allow each control observation to be used more than once.

The *ATT* estimated from Panel B (Table 8) is negative (-0.50%) and significant at the 5% level. Acquirers announcing deals under monetary contraction realize, on average,

[9] It is essential to note that, in the context of this investigation, PSM is not used as a treatment predictor but rather as a balancing mechanism to ensure that the deals on the matched sample are relatively comparable in terms of observable covariates.

0.50% lower announcement period CAR than acquirers announcing their deals under monetary expansion. This treatment effect is relatively close to the effect reported earlier in our univariate analysis in Table 3 (Panel A).

We also assess the effect of monetary contraction on the acquirer's post-acquisition shareholder gains. For each matched pair of deals, we estimate the Buy-and-Hold Returns (BHAR) as the difference between the acquirer's cumulative shareholder gains under monetary contraction compared to the gains in a matched deal under monetary expansion during the 12-month period following the deal's announcement, as described in Equation (5):

$$BHAR_{i,Monetary\ Contraction} = \prod_{t=1}^{t=12}\left(1 + R_{Monetary\ Contraction,t}\right) - \prod_{t=1}^{t=12}\left(1 + R_{Monetary\ Expansion,t}\right) \quad (5)$$

The evidence presented in Panel B (Table 8) suggests the deals announced under monetary contraction experience a significant negative post-acquisition drift in returns compared to deals announced under monetary expansion. In particular, acquirers involved in deals in the former group realize, on average, 4% lower post-acquisition returns than acquirers in the latter group. These findings highlight the significant challenges that acquirers face under monetary contraction as they fail to provide gains to their shareholders as a compensation for the increased riskiness in the business environment.

Panel C (Table 8) highlights the success of the matching exercise in balancing both the propensity score estimates and the key observable variables between the treated and the control groups. More specifically, none of the differences between the observable covariates in the treated and control groups is statistically significant at the 10% level on the matched sample.

(Insert Table 8 about here)

In Table 9, we re-apply our PSM analysis to the comparison between the acquirer CAR in deals announced under high and low MPU. The dependent variable in the Logit model of Panel A is assigned the value of one if the variable "Announcement MPU" exceeds its median level in our sample, and zero otherwise. The results of the matching analysis (Panel B) are also consistent with our univariate analysis of the acquirer CAR: acquirers announcing deals under high MPU realize, on average, 0.81% less acquirer CAR than acquirers announcing their deals under low MPU.[10]

(Insert Table 9 about here)

For the acquirer's post-acquisition gains, our matching-based findings suggest that acquirers under high MPU experience a positive drift in their returns compared to acquirers under low MPU. In the 12-month period that follows the acquisition's announcement, acquirers under high MPU manage to realize 3% higher cumulative gains relative to acquirers in comparable deals under low MPU. This result supports the view that equity investors' concerns about the timing of the M&A under the "real options" channel are short term phenomena (Mitchell and Pulvino, 2001). During the post-acquisition period, acquirers seem to be able to deliver significant gains to their shareholders.[11]

Overall, our results highlight the importance of distinguishing between the direction of monetary policy on the one hand, and the degree of uncertainty surrounding this

[10] Panel C (Table 9) also highlights the success of matching in balancing the key observable covariates. Put together, the evidence from Tables 8 and 9 shows that our results are not influenced by observable differences in firm- or deal-related characteristics.

[11] We further examine how the positive effect of the announcement period MPU on the acquirer's post-acquisition BHAR varies with the acquirer's size. In untabulated results, we find that this positive effect is stronger in the acquisitions announced by small acquirers. This positive effect gradually declines as the acquirer's size increases. To a large extent, these results are aligned with the findings of Moeller et al. (2004) suggesting that acquisitions announced by small companies are not hubris-driven and hence are better designed to increase the acquirer's shareholder value. In the context of our study, this result implies that, once the temporary uncertainty associated with monetary policy is resolved, M&As designed by small acquirers are better suited to increase shareholder wealth compared to M&As designed by larger acquirers.

policy, on the other. While a contractionary monetary policy has a negative impact on the acquirer's shareholder returns in both the short and medium terms, MPU tends to have a temporary negative effect on the acquirer's shareholder wealth only in the short term.

3.2.4. Is the effect of MPU unique?

Our emphasis at the beginning of Section 1 is on the uniqueness of the challenges posed by MPU. We attribute this uniqueness to the far-reaching impact of monetary policy decisions on both the economy and financial markets (Maggio and Kacperczyk, 2017). We also emphasize the limited constraints that monetary policy decision-makers face (Taylor, 2000). This makes monetary policy decisions, and the uncertainty associated with such decisions, highly consequential for (a) companies considering new investments and (b) equity investors assessing the economic prospects of such investments. In this section, we provide an empirical examination of our proposition on the uniqueness of monetary policy challenges. In particular, we examine whether other news-based uncertainties related to the subcategories discussed by Baker et al. (2016) affect various M&A outcomes in similar ways to those of MPU.

In Table 10 (Panel A), we re-report the previously estimated coefficient of MPU on the acquirer CAR. We also estimate the effects of ten policy uncertainty indices on the same M&A outcome. These news-based policy uncertainty indices are related to general fiscal policy (taxes or spending), taxes, spending, healthcare, national security, entitlement programs, regulation, financial regulation, trade policy, and finally sovereign debt/currency crises. Each of these indices is based on the frequency of mentions of policy-specific terms in the Access World News database. For instance, the index associated with trade policy uncertainty is positively correlated with mentions of terms

like "import tariffs," "import duty," "import barrier," "government subsidies," "government subsidy," and "wto," among others.

The coefficients reported in Panel A (Table 10) suggest that, after controlling for the effect of MPU, none of the alternative news-based policy uncertainty indices has an effect on the acquirer CAR that is equivalent to the effect of MPU. General fiscal policy uncertainty and the specific uncertainties related to taxes, spending, national security, regulations, and financial regulations are not associated with significant declines in the acquirer CAR. Moreover, contrary to the case of MPU, equity investors do not require significant discounts when facing uncertainties related to healthcare and entitlement. These investors rather put their trust in the acquirers' ability to navigate such challenges, which leads to a rise in the announcement period CAR. This result supports Nguyen and Phan's (2017) conjecture that a rise in policy uncertainty incentivizes acquirers to be highly prudent in the design of their acquisitions.

(Insert Table 10 about here)

The only exception reported in Panel A is the case of the uncertainty associated with sovereign debt and currency crises. Specifically, equity investors seem to require a discount in response to a rise in such uncertainty. Two aspects of these effects are worth noting. First, the magnitude of the uncertainty discount in the case of sovereign debt and currency crises is considerably smaller than the case of MPU. The coefficient associated with the former uncertainty category (-0.0009) is considerably smaller than the coefficient associated with MPU (-0.006). Second, concerns about sovereign debt and currency crises are not necessarily independent from the actions of monetary authorities. Hence, a reasonable explanation for the small uncertainty discount associated with sovereign debt and currency crises is that this negative market reaction is, to some extent, an extension of equity investors' concerns about monetary uncertainty on a global scale.

In Panel B (Table 10) we expand our multivariate analysis by including the first principal component of the remaining policy categories (*PC1 Others*) as an additional regressor in examining the variation in the acquirer CAR. The construction of this principal component is described in Appendix 1. After controlling for the significant negative effect of MPU, the general inference from the four reported models is that neither *PC1 Others* not its interactions with MPU have any significant influence on the acquirer's announcement period CAR. Put together, these results support our main conjecture that the effect of MPU on the acquirer CAR is not necessarily moderated by uncertainties associated with other policy categories.

3.2.5. Calendar year fixed effects

The next step in our cross-sectional tests aims to examine whether the wealth effects associated with the variables referring to the stance of the monetary policy are conflated by calendar year fixed effects. We address this issue in Table 11, where we present two models that combine monetary policy variables and calendar year fixed effects. To examine the additional effects associated with monetary policy variables, we run a Wald test. In each model we impose the restriction that all the coefficients associated with the variables related to the stance of the monetary policy are jointly equal to zero. This restriction is decisively rejected in the two reported models. We also impose the restriction that all the calendar year fixed effects are jointly equal to zero. Interestingly, this restriction is not easily rejected. The corresponding p-values in Models (1) and (2) are 0.08 and 0.11, respectively. Overall, our results show that the stance of the monetary

policy at the time of the deal's announcement are highly relevant, and their effects are not captured by simple calendar year controls.[12]

(Insert Table 11 about here)

3.2.6. The effect of monetary policy on the premium and contractual provisions

We extend our analysis by examining how monetary policy influences the variation in both the premium paid and the choice of contractual tools. With regards to the premium, Bonaime et al. (2018) find that high general policy uncertainty increases the bargaining power of the target firms and allows them to extract high takeover premia. The evidence that we report in Table 12 (Models (1) and (2)) shows that MPU has a qualitatively similar influence on the takeover premium. In particular, the rise in MPU, both in the period covering due diligence (i.e., "Pre-Announcement MPU") and the period covering the announcement (i.e., "Announcement MPU"), predicts a rise in the takeover premium. In particular, a one standard deviation increase in the "Pre-Announcement MPU" predicts a 6% rise in the takeover premium. Moreover, the short term rise in MPU at the time of the deal's settlement also predicts a rise in the premium, yet a smaller one. A one standard deviation rise in MPU at the time of the deal's announcement predicts a 1% increase in the takeover premium.

An established array of studies investigates the use of the target termination fee provision in the acquisition deal (Bates and Lemmon, 2003; Chapple et al., 2007; Coates, 2009; Coates and Subramanian, 2000; Jeon and Ligon, 2011; Officer, 2003). This provision requires a target deciding not to proceed with the deal to pay a pre-specified sum (a fee) to the acquirer (Bates and Lemmon, 2003). In the realm of M&A, Bonaime et

[12] Our monetary policy's effects reported across the paper do not change if we include calendar year fixed effects in the models.

al. (2018) report that a rise in general policy uncertainty reduces the likelihood of using termination fee provisions. They interpret their result as evidence that high policy uncertainty increases the bargaining power of target firms and limits their requirement to commit to a deal. Our MPU-based results support this interpretation: Logit Models (3) and (4) show that the rise in the MPU during the due diligence phase reduces the likelihood of the presence of termination fee provision in the deal.

Models (5) and (6) (Table 12) extend our analysis to study whether the choice of deferred (earnout) payments by merging firms is affected by the monetary policy's stance. By including an earnout provision in the deal, the acquirer defers a part of the deal payment and links its settlement to the target firm meeting certain pre-determined performance-based goals (Barbopoulos and Sudarsanam, 2012; Kohers and Ang, 2000; Reuer et al., 2004). Earnout provisions are usually used by financially constrained acquirers trying to overcome the valuation and information asymmetry challenges in their deals (Datar et al., 2001; Kohers and Ang, 2000).

Accordingly, earnouts might be an effective tool for acquirers in a contractionary monetary environment. However, a contractionary monetary policy can tighten the acquirer's financing constraints and might limit their ability to commit to deferred payments. Hence, target firms can reject the deferral of a significant part of the payment, and might prefer that their deal payment be fully settled at the time of the deal's announcement. Our results are consistent with this interpretation. Specifically, a rise in both FFR (Model 5) and the deviation of FFR from the natural rate (Model 6) significantly reduce the likelihood of using deferred payments. These findings enhance the rich body of literature that focuses on the determinants of the inclusion of earnout provisions. While this literature mainly focuses on the role of firm- and deal-specific factors in predicting the use of earnouts (Barbopoulos et al., 2012, 2018; Barbopoulos and Adra,

2016; Datar et al., 2001; Kohers and Ang, 2000; Ragozzino and Reuer, 2009), our results add a new dimension by emphasizing the critical role of the monetary environment as a key predictor of earnout inclusion in M&As.[13]

(Insert Table 12 about here)

4. Time Series Analysis of Monetary Policy Effects on M&As

In this section, we extend our analysis to examine the time variation in the aggregate M&A activity. In particular, we examine whether the two monetary-policy-related channels that significantly influence the riskiness and wealth effects of M&A (discussed in Section 3) also affect the variation in the aggregate M&A activity over time. We assess the effect of MPU on the aggregate M&A activity in the context of the "real options" channel via which highly irreversible investments are equivalent to financial call options that can be either exercised or delayed at any point in time (Dixit and Pindyck, 1994; Kellog, 2014). Accordingly, we test whether the rise in MPU is significant to the point where the option to "wait and see" becomes highly valuable to deter companies from engaging in M&As. Furthermore, building on our robust cross-sectional evidence highlighting the negative effect of monetary contraction on the acquirer gains in both the short and long run, we test in a time series context whether monetary contraction is a key contributor to the decline in the M&A activity.

[13] An anonymous reviewer recommended that we examine the impact of monetary policy on the structure of Material Adverse Change (MAC) clauses. A MAC clause provides explicit conditions under which the acquirer can walk away from the deal (Denis and Macias, 2013). We thank Professor David Denis and Professor Antonio Macias who agreed to share with us their dataset that covers deals with MAC clauses between 1998 and 2005. Our analysis shows that monetary tightening reduces the number of MAC clauses. As MAC clauses make the acquirer's otherwise easy abandonment option void under specified circumstances (Bonaime et al., 2018), a tight monetary policy might raise the acquirer's concerns about future financing challenges and hence limits its commitment to the inclusion of MAC clauses. We also find that MPU during the pre-announcement period reduces the number of signed MAC clauses in the deal. Potentially, the concerns about future financing challenges when negotiating a deal incentivizes acquirers, who have already agreed to pay significantly high premia, to limit their commitment to MAC clauses.

Our time series analysis is based on a comprehensive sample covering the quarterly levels of M&As in addition to a wide range of economic variables over the period between 1986 and 2017. We present the level of M&A activity as the natural logarithm of the quarterly dollar sum of domestic M&As that satisfy the criteria presented in Section 2. Furthermore, in addition to controlling for the level of general economic policy uncertainty using the Baker et al. (2016) news-based index, our VAR model includes the quarterly level monetary policy news-based index. This variable is assigned the value of the BBD news-based index that is reported for the second month of each quarter. To assess the impact of monetary contraction/expansion on the aggregate M&A activity, our analysis also includes the quarterly level of FFR. As a proxy for general economic expectations, we use the leading index that is reported by the Federal Reserve Bank of St Louis. Following Bonaime et al. (2018), we include Robert Shiller's Cyclically Adjusted Price-Earnings ratio (first difference) in our estimations. Finally, we control for the effect of aggregate economic conditions via the quarterly level of GDP growth. The variables used in estimating the VAR model are fully defined in Appendix 2.

We estimate a VAR model that combines the variables mentioned above with a one-quarter lag. In Table 13, we report the VAR model equation that explains the variation in the aggregate M&A activity. First, in line with Bonaime et al.'s (2018) results that are based on monthly data, we find that general policy uncertainty is a significant predictor of the decline in the M&A activity. However, our results show that the level of MPU does not influence the M&A activity. Kang et al. (2014) report a qualitatively similar result in their analysis of the impact of MPU on aggregate corporate investment activity. One explanation that they provide for their result is that MPU, and the risks associated with it, tend to be perceived by corporate managers as temporary, hence not requiring them to delay or cancel large investments. Along similar lines, it seems that potential acquirers

are not deterred by the high riskiness associated with MPU when engaging in takeovers. To a large extent, these results are aligned with our cross-sectional evidence from Section 4, whereby acquirers manage to overcome the riskiness associated with MPU to deliver significant post-acquisition gains to their shareholders.

(Insert Table 13 about here)

Second, we find that the rise in FFR is a significant predictor of the decline in M&A activity. The impulse response results presented in Figure 3 support this view by depicting how one Cholesky standard deviation shock in the FFR significantly reduces M&A activity. This aggregate activity takes up to five quarters before starting to recover from the downturn driven by monetary contraction.

Our findings establish a new link between monetary policy and the market for corporate control. In particular, the insignificant impact of MPU on M&A levels does not imply that monetary policy should not be considered an influential factor in the analysis of the variation in M&As. On the contrary, monetary contraction – through its influence on the financing conditions discussed in Section 3 – has a significant and far-reaching negative influence on aggregate M&A value.

Two non-mutually exclusive explanations can be provided for this result. First, monetary contraction tightens the financing constraints of companies (Bernanke and Gertler, 1995; Bernanke and Blinder, 1992; Jiménez et al., 2012; Kashyap et al., 1993) and leads them to reassess the feasibility of expansionary investments such as M&As. Second, monetary contraction predicts future declines in aggregate output (Bernanke and Blinder, 1992; Romer and Romer, 1989), which reduces the value creation prospects of potential acquisitions and hence limits engagement in M&As.

(Insert Figure 3 about here)

5. Conclusion

We provide a direct empirical examination of the relationship between monetary policy and the outcomes associated with Mergers and Acquisitions (M&As). Such outcomes include the acquirer gains within a small window surrounding the M&A's announcement date, M&A completion rates, and post-acquisition variation in the acquirer's debt, liquidity, and buy-and-hold abnormal returns (BHAR). Our results suggest that monetary policy influences M&A outcomes via two distinctive channels. First, via the "expected financing cost" channel, we show that deals announced during periods of monetary contraction tend to reduce acquirers' risk-adjusted returns. We show that this reduction in acquirers' risk-adjusted returns reflects the market's concerns about the leverage and liquidity positions in the aftermath of the acquisition. Second, we show that, in the context of the "real options" view of investments, equity investors require a significant discount for holding the shares of companies that engage in acquisitions during periods of high monetary policy uncertainty (MPU). This discount reflects the high riskiness that acquirers face in an uncertain monetary environment: such deals increase the variation in acquirers' post-acquisition returns. Nevertheless, we show that acquirers, on average, manage to overcome the short term challenges associated with high MPU and eventually manage to realize significant post-acquisition gains.

Our time series evidence emphasizes the relevant role of monetary policy in predicting aggregate M&A activity. Our results show that the federal funds rate, rather than monetary policy uncertainty, is the main monetary-policy-related factor influencing the variation in M&As. Evidence from our impulse response analysis suggests that monetary tightening drives a significant reduction in M&A activity for up to five quarters.

Overall, our emphasis on the distinctive impact of monetary policy on a wide range of M&A outcomes provides a novel link between the monetary policy literature and the field of M&A. Further investigation is required to examine the influence of monetary policy and its related uncertainty on a wider range of corporate actions.

Appendix 1 Variables definitions

Variable	Definition	Source
CAR (%)	The acquirer's 5-day (-2, 2) announcement period cumulative abnormal returns. The abnormal return in each day is the difference between the acquiring firm's actual returns and the acquiring firm's expected returns estimated using the 3-factor FF (1996) model.	CRSP & Kenneth French Webpage & Authors' Estimations
Announcement MPU	The value of the news-based monetary policy uncertainty index at the time of the deal's announcement. If the deal is announced before (after) the 15th day of the month, the value of the news-based monetary policy index in the previous (same) calendar month is assigned to this variable.	http://www.policyuncertainty.com/
Acquirer Market Value	The acquirer's market value 43 days before the acquisition's announcement.	Compustat
Acquirer RoA	The acquirer's return on assets in the calendar year preceding the acquisition's announcement.	Compustat
Federal Funds Rate (*FFR*)	The level of the federal funds rate in the quarter preceding the acquisition's announcement.	Federal Reserve Bank of St Louis
Deviation of *FFR* from Natural Rate	The difference between the federal funds rate and the natural interest rate estimated using the Laubach and Williams (2003) method in the quarter preceding the acquisition's announcement.	Federal Reserve Bank of St Louis and Federal Reserve Bank of San Francisco
Acquirer Book-to-Market	The acquirer's book-to-market value 43 days before the acquisition's announcement.	Compustat
Deal Value	The total dollar value of the deal.	SDC
Relative Deal Size	The total deal value divided by the acquirer's pre-acquisition market valuation.	SDC
Stock Percentage	The percentage of the deal payment that is settled in stock.	SDC
Acquirer Toehold	The percentage of the target shares held by the acquirer six months before the acquisition.	SDC
PC1 Other	The first principal component of the uncertainties associated with alternative policy subcategories. This principal component has the following loading on the policy subcategories: 0.46 (Fiscal Policy), 0.43 (Healthcare), 0.29 (National Security), 0.42 (Entitlement), 0.35 (Regulation), 0.44 (Financial regulation), 0.08 (trade), and 0.08 (Sovereign Debt),	http://www.policyuncertainty.com/ & Authors' Estimations
Pre-Announcement MPU	The average monthly level of the news-based monetary policy uncertainty index between the twelfth and the second month preceding the acquisition's announcement (inclusive).	http://www.policyuncertainty.com/
Acquirer Cash	The acquirer's cash ratio in the calendar year preceding the acquisition.	Compustat
Acquirer Debt	The acquirer's debt ratio in the calendar year preceding the acquisition.	Compustat
VIX	The monthly value of the VIX index at the time of the deal's announcement. The assignment of the VIX values to the month of the deal announcement follows the same rule that is used in constructing the variable "Announcement MPU".	Bloomberg

Continued

Continued (Appendix 1 Variables definitions)

Variable	Definition	Source
Leading Index	The monthly value of the leading index for the U.S. economy at the time of the deal's announcement. This index is the composite of the predicted levels of coincident economic indicators for each state using a VAR model that includes variables related to housing, interest rates, manufacturing, and unemployment. The assignment of the Leading Index values to the month of the deal announcement follows the same rule that is used in constructing the variable "Announcement MPU".	Federal Reserve Bank of St Louis Database
Private	Dummy=1 if the target is a private firm, and 0 otherwise.	SDC
Public	Dummy=1 if the target is a public firm, and 0 otherwise.	SDC
Subsidiary	Dummy=1 if the target is a subsidiary firm, and 0 otherwise.	SDC
Withdrawn	Dummy=1 if the deal is withdrawn, and 0 otherwise.	SDC
Full Cash	Dummy=1 if the deal payment is fully settled in cash, and 0 otherwise.	SDC
Full Stock	Dummy=1 if the deal payment is fully settled in stock, and 0 otherwise.	SDC
Mixed/Other	Dummy=1 if the deal payment is settled using a mix of cash and stock (or any alternative payment method), and 0 otherwise.	SDC
Premium	The difference between the deal value and the target's market value, divided by the latter variable and multiplied by 100.	SDC
Diversified	Dummy=1 if the acquirer and the target have different two-digit SIC codes, and 0 otherwise [Focused].	SDC
Δ Acquirer Sigma	The difference between the standard deviation of the errors from the FF 3-factor regression using the acquirer's daily returns in the year following the acquisition and its equivalent level in the year preceding the announcement.	Compustat
Δ Acquirer Cash	The difference between the acquirer's cash ratio in the year that follows the acquisition and the corresponding level in the year preceding the acquisition.	Compustat
Δ Acquirer Debt	The difference between the acquirer's debt ratio in the year that follows the acquisition and the corresponding level in the year preceding the acquisition.	Compustat
Δ Acquirer Interest-to-Debt	The difference between the value of net interest payment as a percentage to total liabilities in the year following the announcement from the equivalent level in the year preceding the announcement.	Compustat
Δ Acquirer RoA	The difference between the acquirer's return on assets (RoA) in the year that follows the acquisition and the corresponding level in the year preceding the acquisition.	Compustat
Target Termination Fee	Dummy=1 if the deal includes a target termination fee agreement, and 0 otherwise.	SDC
Earnout	Dummy=1 if the deal includes a deferred payment, and 0 otherwise.	SDC

Appendix 2 Time series variables

Variable	Definition	Source
Q_FFR	The quarterly level of the federal funds rate.	Federal Reserve Bank of St Louis Database
Q_MPU	The level of news-based monetary policy uncertainty index at the end of each quarter.	http://www.policyuncertainty.com/
Q_Leading Index	An index estimated by the Federal Reserve Bank of Philadelphia via a Vector Autoregression model that predicts the future values of the U.S. coincident indicators. The VAR model includes variables such as state-level housing permits (1 to 4 units), state initial unemployment insurance claims, delivery times from the Institute for Supply Management (ISM) manufacturing survey, and the interest rate spread between the 10-year Treasury bond and the 3-month Treasury bill.	Federal Reserve Bank of St Louis Database
GDP Growth	The quarterly growth in real Gross Domestic Product.	Federal Reserve Bank of St Louis Database
ΔCAPE	The difference in the level of the Cyclically Adjusted Price Earnings ratio between the month at the end of each quarter and the corresponding level of this ratio in the previous quarter.	Professor Robert Shiller's website
Policy Uncertainty	The level of the aggregated BBD policy uncertainty index at the end of each quarter.	http://www.policyuncertainty.com/
M&A Value	The dollar value of the total number of M&As announced by public acquirers in each quarter.	SDC

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Table 1 Annual distribution of the sample

Year	All	Public	Private	Subsidiary	Withdrawn	Full Cash	Full Stock	Mixed/ Other	Diversified
1986	174	77	65	32	39	60	64	50	59
1987	197	85	77	35	41	63	77	57	74
1988	179	95	42	42	42	82	44	53	69
1989	281	98	104	79	66	92	109	80	111
1990	215	63	85	67	44	67	72	76	92
1991	247	62	117	68	35	49	95	103	91
1992	396	84	213	99	55	84	162	150	145
1993	533	109	285	139	57	131	203	199	204
1994	684	154	376	154	76	170	235	279	266
1995	714	177	366	171	79	181	270	263	260
1996	726	144	420	162	77	170	295	261	295
1997	922	207	495	220	102	214	348	360	361
1998	832	201	469	162	100	188	296	348	323
1999	664	170	374	120	67	149	258	257	249
2000	518	115	318	85	72	96	224	198	190
2001	278	85	124	69	30	76	92	110	113
2002	236	39	127	70	23	88	38	110	81
2003	189	49	91	49	14	52	38	99	63
2004	265	62	141	62	19	123	39	103	76
2005	373	65	204	104	27	176	35	162	126
2006	390	66	214	110	31	203	24	163	163
2007	403	89	222	92	55	188	36	179	139
2008	319	58	175	86	55	158	25	136	116
2009	213	57	97	59	27	101	33	79	67
2010	247	54	117	76	25	149	15	83	82
2011	246	46	133	67	20	123	19	104	82
2012	270	57	133	80	17	139	23	108	87
2013	238	49	116	73	51	125	25	88	62
2014	368	76	210	82	31	160	46	162	101
2015	378	89	186	103	34	104	31	243	135
2016	296	73	126	97	79	75	22	199	108
2017	359	64	187	108	47	75	31	253	129
N	12,350	2,919	6,409	3,022	1,537	3,911	3,324	5,115	4,519
%	100	23.64	51.89	24.47	12.45	31.67	26.91	41.42	36.59

The table presents the annual distribution of our sample of domestic M&As announced by U.S. public acquirers between 1 January 1986 and 31 December 2017. The targets covered in the sample are public, private, and subsidiary firms. The annual distribution of the sample, which depicts the sum of the annual M&A activity, is presented according to the target firm's listing status, the deal's completion profile (withdrawn/completed), the payment method used (full cash, full stock, mix of cash and stock, or other method), and the scope of industrial diversification in the deal (diversified/focused).

Table 2 Descriptive statistics

Variable	*N*	Mean (1)	Median (2)	25th Percentile (3)	75th Percentile (4)	Mean Under High MPU (5)	Mean Under Low MPU (6)	(5)-(6)	Mean Under Monetary Expansion (7)	Mean Under Monetary Contraction (8)	(7)-(8)
Acquirer Market Value	12,350	3,406.20	325.81	80.01	1,273.24	2,650.62	4,201.47	-1,550.85***	2,673.08	4,132.95	-1,459.87***
Acquirer Book-to-Market	9,561	0.49	0.40	0.23	0.65	0.56	0.46	0.10***	0.52	0.47	0.05***
Deal Value	12,350	415.46	31.00	9.75	124.89	296.87	540.30	-243.43***	356.85	473.58	-107.73*
Relative Deal Size	12,350	0.45	0.12	0.04	0.34	0.45	0.46	-0.01	0.46	0.44	0.02
Stock Percentage	12,350	38.86	6.67	0.00	100.00	39.32	38.39	0.93	41.06	36.69	4.37***
Acquirer Toehold	12,350	0.03	0.00	0.00	0.21	0.04	0.02	0.02*	0.04	0.02	0.02
Pre-Announcement MPU	12,350	86.81	82.33	66.57	106.48	93.04	80.26	12.78***	98.61	75.11	23.50***
Acquirer Cash	10,941	13.57	6.44	2.22	18.20	13.67	13.46	0.21	14.16	12.99	1.17***
Acquirer Debt	11,197	53.59	52.67	30.41	74.53	53.31	53.88	-0.57	52.66	54.50	-1.84***
VIX	11,519	18.89	17.19	13.37	23.26	20.44	17.32	3.12***	20.73	17.01	-3.72***
Leading Index	12,350	1.39	1.56	1.15	1.81	1.25	1.52	-0.27***	1.27	1.50	-1.23***
Acquirer RoA	9,659	-3.46	3.33	-2.13	7.33	-4.03	-2.85	-1.18*	-3.99	-2.97	-1.02
Premium	2,361	49.95	37.00	20.00	62.00	53.89	45.99	7.9***	53.40	46.50	6.9***
Δ Acquirer Interest-to-Debt	6,634	-0.19	-0.01	-0.92	0.95	-0.24	0.14	0.10	-0.37	-0.04	-0.33***
Δ Acquirer Debt	9,771	6.57	1.66	-2.53	12.01	6.39	6.76	-0.37	5.73	7.33	-1.60**
Δ Acquirer Cash	9,517	-3.98	-0.63	-25.48	4.72	-3.79	-4.18	1.01	-4.43	-3.58	-0.85***
Δ Acquirer RoA	8,370	-9.13	-1.35	-5.19	0.94	-9.41	-8.82	-0.59	-5.70	-12.25	6.55**
Δ Acquirer Sigma	12,242	0.09	-0.04	-0.06	0.30	0.08	0.10	-0.02	0.03	0.14	0.11***

The table presents the key descriptive statistics of the empirical variables used in the analysis. For each variable, we report the number of available observations, the mean, and the median in addition to the 25th and 75th percentiles. Additionally, we report the mean level of each variable under high and low monetary policy uncertainty (MPU), in addition to the difference between these two levels and its significance. Deals are classified in the high (low) MPU group if the value of the "Announcement MPU" variable is above (below) the median level in our sample. We follow the same approach in analyzing the means of the deals announced under monetary expansion and monetary contraction. The classification of deals into groups defined by monetary expansion and contraction is based on the level of the annual change in the level of the federal funds rate in the quarter preceding the deal's announcement. The median level of this change in our sample is 0, which allows us to split the sample into two equal groups of deals under monetary expansion and deals under monetary contraction. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 3 Univariate analysis of acquirer CAR under different monetary regimes

Panel A: Monetary policy stance				
Statistic\Group	All Deals	Contraction	Expansion	Contraction minus Expansion
Mean	2.23***	1.84***	2.63***	-0.79***
N	12,350	6,175	6,175	
Panel B: Announcement MPU				
Statistic\Group	All Deals	High	Low	High minus Low
Mean	2.23***	1.99***	2.48***	-0.49**
N	12,350	6,175	6,175	

The table presents the univariate analysis of the acquirer's CAR under monetary contraction and expansion (Panel A) and under high and low monetary policy uncertainty (Panel B). In Panel A, we report the average acquirer CAR in the overall sample, the average level under monetary contraction, and its equivalent under monetary expansion, in addition to the difference between these two levels and its level of significance. We also report the number of observations in each group. We follow a similar approach in Panel B, where we report the average acquirer CAR in the overall sample, the average level under high monetary policy uncertainty, and its equivalent under low monetary policy uncertainty, in addition to the difference between these two levels and its level of significance. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 4 Multivariate analysis on acquirer CAR

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Period	All	All	All	All	Monetary Contraction	Monetary Contraction	Monetary Expansion	Monetary Expansion
Dependent Variable/Explanatory Variable	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
Federal Funds Rate (*FFR*)	-0.175***		-0.139***	-0.143**	-0.174***		-0.113	
	(0.052)		(0.060)	(0.074)	(0.063)		(0.093)	
Deviation of *FFR* from Natural Rate		-0.205***				-0.199**		-0.010***
		(0.068)				(0.086)		(0.003)
Announcement MPU	-0.006***	-0.007***	-0.006**	-0.005*	-0.001	-0.002	-0.010***	-0.010***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Pre-Announcement MPU	0.009**	0.007*	0.003	0.005	-0.002	-0.004	0.012**	0.012*
	(0.004)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)
Full Cash	-0.382	-0.317	-0.384	-0.312	-0.022	0.113	-0.699	-0.693
	(0.326)	(0.323)	(0.331)	(0.412)	(0.378)	(0.377)	(0.526)	(0.523)
Full Stock	0.793*	0.679*	0.893**	1.275**	1.078	0.905*	0.491	0.467
	(0.414)	(0.408)	(0.437)	(0.619)	(0.560)	(0.553)	(0.607)	(0.596)
Diversified	0.565**	0.692***	0.621**	0.523	-0.044	0.246	1.086**	1.047***
	(0.293)	(0.272)	(0.311)	(0.364)	(0.354)	(0.338)	(0.464)	(0.424)
ln(Acquirer Market Value)	-1.768***	-1.769***	-1.779***	-1.952***	-1.400***	-1.414***	-2.135***	-2.126***
	(0.150)	(0.147)	(0.159)	(0.188)	(0.161)	(0.159)	(0.249)	(0.246)
ln(Deal Value)	1.177***	1.199***	1.256***	1.375***	0.867***	0.901***	1.493***	1.501***
	(0.163)	(0.162)	(0.178)	(0.208)	(0.142)	(0.141)	(0.295)	(0.295)
Private	3.582***	3.743***	3.938***	4.089***	3.005***	3.373***	4.119***	4.076***
	(0.358)	(0.346)	(0.392)	(0.546)	(0.469)	(0.455)	(0.543)	(0.521)
Subsidiary	4.550***	4.705***	4.875***	5.039***	3.347***	3.670***	5.788***	5.744***
	(0.468)	(0.456)	(0.510)	(0.606)	(0.465)	(0.449)	(0.831)	(0.806)
Acquirer Toehold	0.138	0.137	0.171	0.282	0.054	0.060	0.257	1.047***
	(0.172)	(0.173)	(0.226)	(0.265)	(0.247)	(0.250)	(0.239)	(0.424)
VIX			-0.088***	-0.072***				
			(0.234)	(0.027)				
Leading Index			-0.153	-0.384				
			(0.027)	(0.282)				
Acquirer Book-To-Market				-0.672				
				(0.649)				
Acquirer Cash				-0.003				
				(0.014)				
Acquirer Debt				-0.006				
				(0.008)				
Acquirer RoA				-0.017*				
				(0.009)				
Intercept	5.544***	4.900***	5.692***	8.083***	5.647***	4.616***	5.491***	5.241***
	(0.953)	(0.812)	(1.889)	(1.647)	(1.258)	(1.091)	(1.461)	(1.248)
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES
N	12.350	12.350	11,506	7,934	6,175	6,175	6,175	6,175
Adjusted R-Squared	0.05	0.05	0.05	0.06	0.04	0.04	0.06	0.06

The table presents eight models explaining the variation in the acquirer's announcement period CAR. Models (1) and (2) are estimated on the initial sample. Model (3) controls for the effects of the leading index and the level of the VIX at the time of the deal's announcement on the subsample starting from the year 1990, the first year for which the VIX data is publicly available. Model (4) expands the analysis to cover acquirer-specific pre-acquisition financial variables. Models (5) and (6) are estimated on the sample of deals announced in the aftermath of monetary contraction, i.e. annual rise in the federal funds rate (FFR). Models (7) to (8) are estimated on the sample of deals announced in the aftermath of monetary expansion. White (1980) standard errors are reported in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 5 The monetary policy effect on CAR under different debt and liquidity regimes

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Group of deals	High Acquirer Debt	High Acquirer Debt	Low Acquirer Debt	Low Acquirer Debt	High Acquirer Cash Ratio	High Acquirer Cash Ratio	Low Acquirer Cash Ratio	Low Acquirer Cash Ratio
Dependent Variable/Explanatory Variable	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
Federal Funds Rate (*FFR*)	-0.226***		-0.082		-0.071		-0.276***	
	(0.084)		(0.090)		(0.090)		(0.088)	
Deviation of *FFR* from Natural Rate		-0.328***		-0.093		-0.042		-0.415***
		(0.107)		(0.125)		(0.126)		(0.105)
Announcement MPU	-0.007*	-0.007*	-0.010*	-0.010*	-0.010**	-0.010**	-0.007*	-0.007*
	(0.004)	(0.004)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)
Intercept	6.123***	6.069***	8.977***	8.856***	7.812***	7.606***	6.655***	6.603***
	(1.281)	(1.236)	(1.840)	(1.804)	(1.618)	(1.573)	(1.477)	(1.434)
Control Factors	YES	YES	YES	YES	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES
N	5,282	5,282	5,282	5,282	4,990	4,990	4,990	4,990
Adjusted R-Squared	0.06	0.05	0.05	0.06	0.05	0.05	0.06	0.06

The table presents eight models explaining the variation in the acquirer's CAR under different leverage and liquidity regimes. The control variables are the same as those used in Model (3) in Table 4. Models (1) and (2) are estimated on the sample of deals in which the acquirer's debt ratio exceeds the median level in the sample. Models (3) and (4) are estimated on the sample of deals in which the acquirer's debt ratio is below the median level in the sample. Models (5) and (6) are estimated on the sample of deals in which the acquirer's cash ratio exceeds the median level in the sample. Models (7) and (8) are estimated on the sample of deals in which the acquirer's cash ratio is below the median level in the sample. For each pair of models, the level of the federal funds rate (FFR) in the quarter preceding the announcement is used as proxy for the stance of monetary policy in the first model. The difference between FFR and the corresponding natural rate of interest estimated using the Laubach and Williams (2003) method is used in the second model. White (1980) standard errors are reported in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 6 Multivariate analysis of additional post-acquisition outcomes

Dependent Variable/ Explanatory Variable	Δ Acquirer RoA	Δ Acquirer RoA	Δ Acquirer Debt	Δ Acquirer Debt	Δ Acquirer Cash	Δ Acquirer Cash	Δ Acquirer Interest-to-Debt	Δ Acquirer Interest-to-Debt	Δ Acquirer Sigma	Δ Acquirer Sigma
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All Deals										
Federal Funds Rate (*FFR*)	-1.371***		0.464***		-0.226***		0.178***		0.100***	
	(0.380)		(0.122)		(0.040)		(0.011)		(0.007)	
Deviation of *FFR* from Natural Rate		-1.773***		0.660***		-0.196***		0.231***		0.121***
		(0.604)		(0.226)		(0.055)		(0.018)		(0.010)
Announcement MPU	0.006	0.006	-0.006	-0.006	0.003	0.003	-0.0008	-0.0009	0.0008**	0.0009**
	(0.019)	(0.019)	(0.008)	(0.008)	(0.002)	(0.002)	(0.0006)	(0.0006)	(0.0004)	(0.0004)
Intercept	-20.724*	-22.962**	19.204***	19.654***	1.945***	1.274**	2.989***	3.253***	3.804***	3.954***
	(10.927)	(10.623)	(3.137)	(3,015)	(0.645)	(0.631)	(0.194)	(0.200)	(0.367)	(0.378)
Control Factors	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	8,370	8,370	9,771	9,771	9,517	9,517	6,634	6,634	12,342	12,342
R-Squared	0.01	0.01	0.06	0.06	0.53	0.55	0.56	0.56	0.32	0.32
Panel B: Deals with Early Withdrawal										
Federal Funds Rate (*FFR*)	0.820		0.385		-0.927***		0.202***		-0.040	
	(0.909)		(0.587)		(0.275)		(0.063)		(0.053)	
Deviation of *FFR* from Natural Rate		1.434		0.515		-0.898***		0.202**		-0.089
		(1.182)		(0.717)		(0.348)		(0.083)		(0.067)
Announcement MPU	0.012	0.013	-0.030	-0.030	-0.006	-0.007	-0.003	-0.003	0.002	0.002
	(0.043)	(0.044)	(0.023)	(0.023)	(0.011)	(0.012)	(0.004)	(0.004)	(0.003)	(0.003)
Intercept	-19.725	-13.737	18.546**	18.962***	1.274	-0.850	3.718***	4.158***	8.702***	8.755***
	(12.293)	(12.319)	(7.727)	(7.507)	(3.755)	(3.761)	(1.004)	(1.011)	(0.989)	(0.965)
Control Factors	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	305	305	342	342	337	337	225	225	476	476
R-Squared	0.01	0.01	0.05	0.05	0.41	0.41	0.56	0.55	0.69	0.69
Panel C: Completed Deals/Deals with Late Withdrawal										
Federal Funds Rate (*FFR*)	-1.337***		0.593***		-0.262***		0.210***		0.092***	
	(0.485)		(0.133)		(0.041)		(0.015)		(0.007)	
Deviation of *FFR* from Natural Rate		-1.744***		0.840***		-0.249***		0.267***		0.114***
		(0.666)		(0.248)		(0.056)		(0.022)		(0.009)
Announcement MPU	0.007	0.007	-0.005	-0.005	0.004**	0.004*	-0.0009	-0.0009	0.0006*	0.0007*
	(0.024)	(0.024)	(0.008)	(0.008)	(0.002)	(0.002)	(0.0006)	(0.0006)	(0.0004)	(0.0004)
Intercept	-30.270***	-32.410***	36.471***	37.079***	4.001***	3.308***	2.857***	3.221***	3.454***	3.5844***
	(7.880)	(7.644)	(4.129)	(3.991)	(0.625)	(0.614)	(0.232)	(0.237)	(0.256)	(0.268)
Control Factors	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	8,065	8,065	9,429	9,429	9,180	9,180	6,409	6,409	11,866	11,866
R-Squared	0.01	0.01	0.06	0.06	0.53	0.53	0.58	0.58	0.23	0.23

The table presents ten models which represent the variation in five post-acquisition outcomes. Models (1) and (2) explain the variation in the change in the acquirer's Return on Assets (RoA) between the year that follows the acquisition and the year that precedes it. Models (3) and (4) explain the variation in the acquirer's debt ratio over the same period. Models (5) and (6) apply an equivalent analysis to the change in the acquirer's cash ratio. Models (7) and (8) analyze the difference in the percentage of the acquirer's net interest payments relative to total debt. Models (9) and (10) analyze the difference in the sigma of the acquirer's daily returns before and after the acquisition's announcement. The control variables in each model are the same as those reported in Table 6. Moreover, in each model, we include the lagged level of the independent variable as an additional regressor. Panel A reports the analysis for the overall sample. Panel B limits the analysis to the deals that are withdrawn within one

quarter of the announcement. Panel C applies the analysis to completed deals and the deals that are cancelled after one quarter of the announcement. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 7 The likelihood of deal withdrawal

Model	(1)	(2)	(3)	(4)
Dependent Variable/ Explanatory Variable	Withdrawn=1 Otherwise=0	Withdrawn=1 Otherwise=0	Withdrawn=1 Otherwise=0	Withdrawn=1 Otherwise=0
Federal Funds Rate (*FFR*)	0.096***		0.086***	
	(0.017)		(0.020)	
Deviation of *FFR* from Natural Rate		0.129***		0.118***
		(0.020)		(0.027)
Announcement MPU	0.001*	0.001*	0.0004	0.0004
	(0.0006)	(0.0006)	(0.0009)	(0.0009)
Pre-Announcement MPU	0.004***	0.005***	0.001	0.003
	(0.001)	(0.001)	(0.002)	(0.002)
Full Cash	-0.041	-0.043	-0.095	-0.099
	(0.106)	(0.103)	(0.114)	(0.114)
Full Stock	0.294***	0.315***	0.324***	0.335***
	(0.102)	(0.010)	(0.106)	(0.106)
Diversified	0.155*	0.155**	0.207**	0.209**
	(0.084)	(0.081)	(0.089)	(0.088)
ln(Acquirer Market Value)	-0.452***	-0.454***	-0.498***	-0.500***
	(0.029)	(0.028)	(0.033)	(0.033)
ln(Deal Value)	0.436***	0.432***	0.468***	0.467***
	(0.031)	(0.030)	(0.035)	(0.035)
Private	-1.370***	-1.372***	-1.287***	-1.291***
	(0.102)	(0.099)	(0.112)	(0.112)
Subsidiary	-1.262***	-1.279***	-1.196***	-1.199***
	(0.119)	(0.115)	(0.134)	(0.134)
Acquirer Toehold	0.135***	0.136***	0.164***	0.166***
	(0.051)	(0.550)	(0.063)	(0.063)
VIX			0.010*	0.013**
			(0.006)	(0.006)
Leading Index			-0.218***	-0.157**
			(0.070)	(0.071)
Intercept	-1.878***	-1.998***	-1.646***	-1.762***
	(0.278)	(0.227)	(0.347)	(0.356)
Industry Effects	YES	YES	YES	YES
N	12,350	12,350	11,506	11,506
Pseudo R-Squared	0.16	0.16	0.16	0.16

The table presents four Logit models predicting the likelihood of deal withdrawal. The dependent variable (Withdrawn) is assigned the value of 1 if the deal is withdrawn, and 0 otherwise. In Models (1) and (3), the stance of monetary policy is presented by the level of the federal funds rate in the quarter preceding the announcement. In Models (2) and (4), this stance is presented by the difference between the federal funds rate and the Laubach and Williams (2003) natural rate of interest. Models (3) and (4) control for two additional factors: the VIX index and the Leading Economic index for the United States. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 8 PSM analysis under monetary policy stance (contraction vs. expansion)

Panel A: Logit model

Intercept	Full Cash	Full Stock	Diversified	ln(Acquirer Market Value)	ln(Deal Value)	Private	Subsidiary	Acquirer Toehold	*N*
0.350**	0.024**	-0.017	0.015*	0.020***	0.004	0.019	0.005	-0.016	12,350
(0.020)	(0.012)	(0.013)	(0.009)	(0.003)	(0.003)	(0.012)	(0.014)	(0.011)	

Panel B: Matching Results for CAR

Matching Algorithm	Caliper=0.001 with replacement
Matched Observations per Treated Deal	1:1
Number of Treated Observations	5,529
Number of Control Observations	5,529
CAR *ATT* (%) (Abadie and Imbens (2006) Standard Errors)	-0.50** (0.25)
BHAR *ATT* (%) (Abadie and Imbens (2006) Standard Errors)	-4.37***(1.15)

Panel C: Covariates' Balancing

Sample	Before Matching			After Matching		
Variable	Treatment Group	Control Group	*p*-value	Treatment Group	Control Group	*p*-value
Propensity Score	0.51	0.49	0.00	0.50	0.50	0.59
Full Cash	0.51	0.47	0.00	0.50	0.50	0.53
Full Stock	0.25	0.29	0.00	0.26	0.26	0.76
Diversified	0.37	0.36	0.30	0.36	0.37	0.40
ln(Acquirer Market Value)	5.99	5.60	0.00	5.83	5.83	0.80
ln(Deal Value)	3.75	3.52	0.00	3.64	3.63	0.66
Private	0.51	0.52	0.62	0.52	0.51	0.70
Subsidiary	0.25	0.24	0.41	0.25	0.25	0.50
Acquirer Toehold	0.03	0.04	0.13	0.10	0.02	0.11

The table presents the outcome of the propensity score matching analysis with emphasis on the effect of monetary contraction on the acquirer's CAR and its post-acquisition buy-and-hold returns. The treatment variable is assigned the value of 1 if the federal funds rate increased on a yearly basis in the quarter preceding the acquisition announcement, and 0 otherwise. Panel A presents the logit model used to assign the deal into a contractionary (expansionary) monetary policy periods. Panel B presents the outcome of the matching algorithm with replacement and a caliper of 0.001. We report the number of matched observations to each treated one and the number of treated and control observations on the matched sample, in addition to the estimated *ATT*s with Abadie and Imbens (2006) standard errors. In Panel C, we report the mean of each variable in the treated group and the control group, in addition to the bootstrapped *p*-value from the *t*-test of the null hypothesis that the difference is statistically equal to 0, both before and after matching. The Abadie and Imbens (2006) standard deviation is reported in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 9 PSM analysis on high vs. low MPU

Panel A: Logit model									
Intercept	Full Cash	Full Stock	Diversified	ln(Acquirer Market Value)	ln(Deal Value)	Private	Subsidiary	Acquirer Toehold	*N*
0.670***	0.015	0.013	-0.007	-0.012***	-0.016***	-0.051***	-0.043***	0.019*	12,350
(0.020)	(0.012)	(0.013)	(0.009)	(0.003)	(0.007)	(0.012)	(0.014)	(0.011)	

Panel B: Matching Results for CAR	
Matching Algorithm	Caliper=0.001 with replacement
Matched Observations per Treated Deal	1:1
Number of Treated Observations	5,712
Number of Control Observations	5,712
CAR *ATT* (%) (Abadie and Imbens (2006) Standard Errors)	-0.81*** (0.27)
BHAR *ATT* (%) (Abadie and Imbens (2006) Standard Errors)	2.91***(1.21)

Panel C: Covariates' Balancing						
Sample	Before Matching			After Matching		
Variable	Treatment Group	Control Group	*p*-value	Treatment Group	Control Group	*p*-value
Propensity Score	0.52	0.51	0.00	0.52	0.52	0.11
Full Cash	0.49	0.49	0.47	0.49	0.49	0.92
Full Stock	0.28	0.26	0.08	0.27	0.28	0.63
Diversified	0.37	0.36	0.53	0.36	0.37	0.62
ln(Acquirer Market Value)	5.63	5.96	0.00	5.65	5.65	0.97
ln(Deal Value)	3.49	3.79	0.00	3.46	3.47	0.67
Private	0.51	0.51	0.93	0.53	0.53	0.83
Subsidiary	0.24	0.25	0.31	0.24	0.24	0.92
Acquirer Toehold	0.04	0.03	0.06	0.01	0.01	0.63

The table presents the outcome of the propensity score matching analysis with emphasis on the effect of monetary policy uncertainty on the acquirer's CAR and its post-acquisition buy-and-hold returns. The main treatment variable is assigned the value of 1 if the variable "Announcement MPU" exceeds its median level in our sample, and 0 otherwise. Panel A presents the logit model used to assign the deal into high (low) MPU periods. Panel B presents the outcome of the matching algorithm with replacement and a caliper of 0.001. We report the number of matched observations to each treated one and the number of treated and control observations on the matched sample, in addition to the estimated *ATT*s with Abadie and Imbens (2006) standard errors. In Panel C, we report the mean of each variable in the treated group and the control group, in addition to the bootstrapped *p*-value from the *t*-test of the null hypothesis that the difference is statistically equal to 0, both before and after matching. The Abadie and Imbens (2006) standard deviation is reported in parentheses. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 10 The effects of the alternative policy uncertainty subcategories on the acquirer CAR

Panel A: The individual wealth effects of different policy subcategories

Type of Policy Uncertainty	Announcement MPU	Fiscal (General)	Taxes	Spending	Healthcare	National Security	Entitlement	Regulation	Financial Regulation	Trade	Sovereign Debt/ Currency
Effect on CAR	-0.006***	0.00005	0.0005	0.0005	0.0027*	-0.0002	0.004**	0.002	0.0004	0.0006	-0.0009*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.0016)	(0.003)	(0.002)	(0.003)	(0.0013)	(0.001)	(0.0005)

Panel B: The wealth effects based on the principal component of the other policy categories

Model	(1)	(2)	(3)	(4)
Dependent Variable/Explanatory Variable	CAR	CAR	CAR	CAR
Federal Funds Rate (*FFR*)	-0.141***	-0.149***		
	(0.058)	(0.057)		
Deviation of *FFR* from Natural Rate			-0.179***	-0.188***
			(0.073)	(0.072)
Announcement MPU	-0.008***	-0.009***	-0.008***	-0.010***
	(0.003)	(0.003)	(0.003)	(0.003)
PC1 Other	0.051	-0.092	0.069	-0.070
	(0.081)	(0.122)	(0.079)	(0.122)
PC1 Other × Announcement MPU		0.001		0.001
		(0.001)		(0.001)
Intercept	5.912***	6.008***	5.646***	5.726***
	(0.716)	(0.714)	(0.662)	(0.662)
Control Factors	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
N	12,350	12,350	12,350	12,350
Adjusted R-Squared	0.06	0.05	0.05	0.06

The table assesses the uniqueness of the wealth effects associated with MPU relative to other policy categories. Panel A presents the effects of each policy subcategory on the acquirer CAR. In assessing the wealth impact of MPU in Panel A, we report the coefficient associated with "Announcement MPU" from Model (1) (Table 4). For the wealth effects of the remaining policy categories, we control for the effects of MPU and the other variables in Model (1) (Table 4). In Panel B, we report four models including both MPU and the first principal component of the remaining policy categories (PC1 Other). Models (1) and (3) do not include the interactive relationship between MPU and the principle component of the remaining policies while Models (2) and (4) control for this interactive effect. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 11 The calendar-year effects on CAR

Model	(1)	(2)
Dependent Variable	CAR	CAR
Federal Funds Rate (*FFR*)	-0.239*** (0.087)	
Deviation of *FFR* from Natural Rate		-0.305*** (0.122)
Announcement period MPU	-0.006** (0.003)	-0.006*** (0.002)
Pre-Announcement period MPU	0.003 (0.010)	-0.004 (0.009)
Full Cash	-0.319 (0.324)	-0.319 (0.324)
Full Stock	0.815* (0.427)	0.803* (0.429)
Diversified	0.532* (0.293)	0.522* (0.292)
ln(Acquirer Market Value)	-1.773*** (0.152)	-1.762*** (0.151)
ln(Deal Value)	1.182*** (0.161)	1.175*** (0.160)
Private	3.533*** (3.539)	3.576*** (0.376)
Subsidiary	4.486*** (0.469)	4.515*** (0.471)
Acquirer Toehold	0.132 (0.176)	0.152 (0.172)
Intercept	6.358*** (1.832)	6.685*** (1.737)
p-value (H_0: No Calendar Year Effects)	0.08	0.11
p-value (H_0: No Monetary Policy Effect)	0.00	0.00
Calendar Year Effects	YES	YES
Industry Effects	YES	YES
N	12,350	12.350
Adjusted R-Squared	0.05	0.05

The table presents two models explaining the variation in the acquirer's CAR while controlling for calendar year fixed effects. For each model, we report the p-value from the Wald restriction that the calendar year effects are jointly equal to 0. We also report the p-value from the restriction that the effects of monetary policy-related variables (the coefficients of Federal Funds Rate (FFR) and Announcement period MPU) in Model (1) and the coefficients of Deviation of FFR from Natural Rate and Announcement period MPU) in Model (2)) are jointly equal to 0. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 12 The impact of monetary policy on the use of target termination fees and earnouts

Model	(1)	(2)	(3)	(4)	(5)	(6)
Model Type	OLS	OLS	Logit	Logit	Logit	Logit
Dependent Variable/Explanatory Variables	Premium	Premium	Target Term Fee=1 Otherwise=0	Target Term Fee=1 Otherwise=0	Earnout=1 Otherwise=0	Earnout=1 Otherwise=0
Federal Funds Rate (*FFR*)	-0.453		-0.163***		-0.125***	
	(0.415)		(0.014)		(0.014)	
Deviation of *FFR* from Natural Rate		-0.381		-0.229***		-0.138***
		(0.597)		(0.020)		(0.021)
Announcement period MPU	0.046**	0.045**	-0.0004	-0.0005	0.0009	0.0008
	(0.021)	(0.022)	(0.0007)	(0.0007)	(0.0007)	(0.0007)
Pre-Announcement period MPU	0.211**	0.208***	-0.006***	-0.007***	0.0001	-0.0009
	(0.041)	(0.040)	(0.001)	(0.001)	(0.0007)	(0.001)
Full Cash	1.833	1.885	-0.672***	-0.646***		
	(2.712)	(1.722)	(0.088)	(0.088)		
Full Stock	1.736	1.506	-0.344***	-0.385***		
	(3.078)	(3.077)	(0.096)	(0.096)		
Diversified	2.663	2.655	-0.117	-0.121	0.218***	0.218***
	(2.188)	(2.188)	(0.075)	(0.075)	(0.070)	(0.070)
ln(Acquirer Market Value)	-1.143**	-1.065**	0.046**	0.053**	-0.052***	-0.036*
	(0.534)	(0.526)	(0.023)	(0.024)	(0.021)	(0.020)
ln(Deal Value)			0.212***	0.216***	0.048**	0.057**
			(0.027)	(0.027)	(0.024)	(0.024)
Private	0.800	0.889	-2.990***	-2.969***	2.952***	2.990***
	(2.683)	(2.687)	(0.105)	(0.104)	(0.246)	(0.246)
Subsidiary	2.368	2.403	-3.892***	-3.868***	2.455***	2.497***
	(2.193)	(3.196)	(0.171)	(0.170)	(0.250)	(0.250)
Acquirer Toehold	-4.048***	-4.090***	-0.286***	-0.288***	-0.099	-0.107
	(1.197)	(1.200)	(0.080)	(0.081)	(0.167)	(0.169)
Intercept	36.386**	35.134**	-1.022**	-1.176**	-4.964***	-5.254***
	(15.481)	(15.424)	(0.509)	(0.503)	(0.528)	(0.526)
Number of Target Termination Fees	311	311	1,579	1,579	1,579	1,579
Number of Earnouts	182	182	1,062	1,062	1,062	1,062
Industry Effects	YES	YES	YES	YES	YES	YES
N	2,361	2,361	12,350	12.350	12,350	12.350
Adjusted (Pseudo) R-Squared	0.02	0.02	0.39	0.39	0.11	0.10

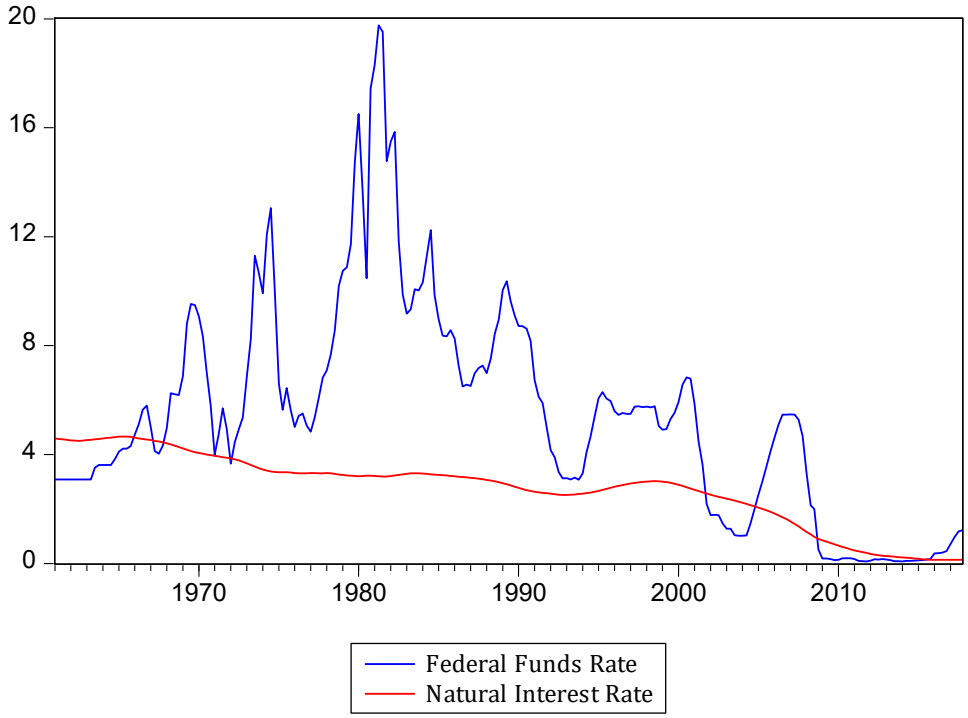
The table presents two OLS regressions explaining the variation in the premium and four logit models predicting the choice of contractual arrangements in the M&As. Models (1) and (2) explain the variation in the takeover premium in public target acquisitions. This premium is estimated as in Officer (2003). Models (3) and (4) predict the use of target termination fee agreements. The dependent variable in these models is assigned the value of 1 if a target termination fee agreement is present in the deal, and 0 otherwise. Models (5) and (6) predict the inclusion of deferred payments (earnout) contracts. The dependent variable is assigned the value of 1 if an earnout is present in the deal, and 0 otherwise. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 13 VAR Model

Dependent Variable	$ln(M\&A\ Value)_t$
Explanatory Variable\Model	(1)
Q_FFR_{t-1}	-0.076*** (0.033)
Q_MPU_{t-1}	0.003 (0.002)
$Q\_Leading\ Index_{t-1}$	0.090 (0.137)
$GDP\ Growth_{t-1}$	-0.046 (0.182)
$\Delta CAPE_{t-1}$	0.028 (0.052)
$Policy\ Uncertainty_{t-1}$	-0.007** (0.003)
$\ln(M\&A\ Value)_{t-1}$	0.567*** (0.081)
Intercept	4.982*** (1.050)
N	127
Adjusted R-Squared	0.41

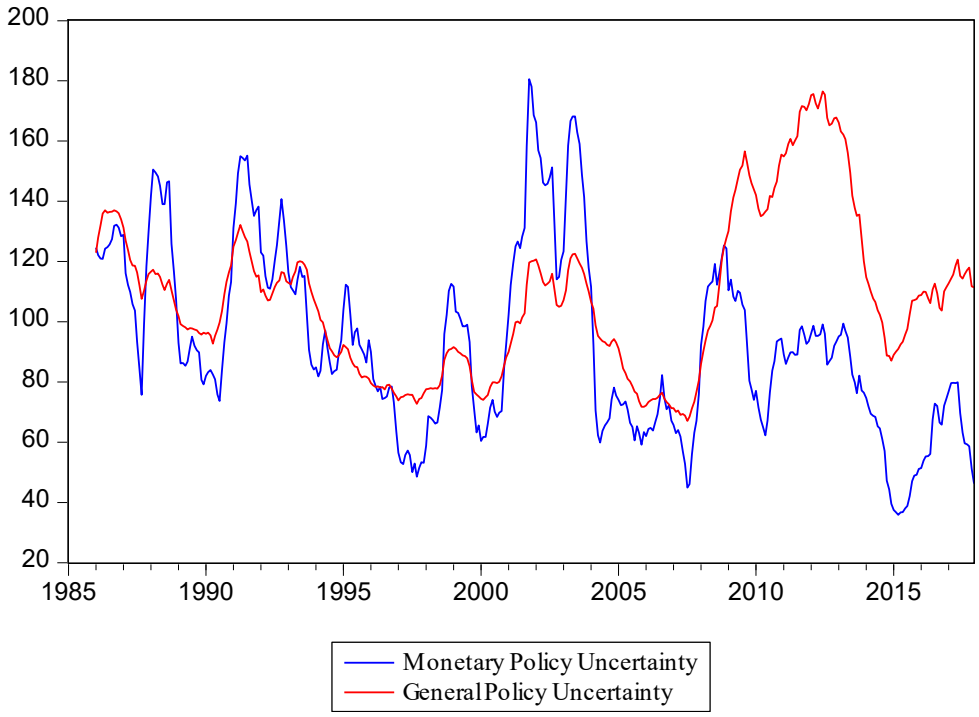
The table presents the equation that explains the variation in the natural logarithm of the M&A dollar value. This equation is part of a 7-variable VAR model with one-quarter lags. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 2 for an accurate description of the variables.

Figure 1 The federal funds rate and the natural rate of interest



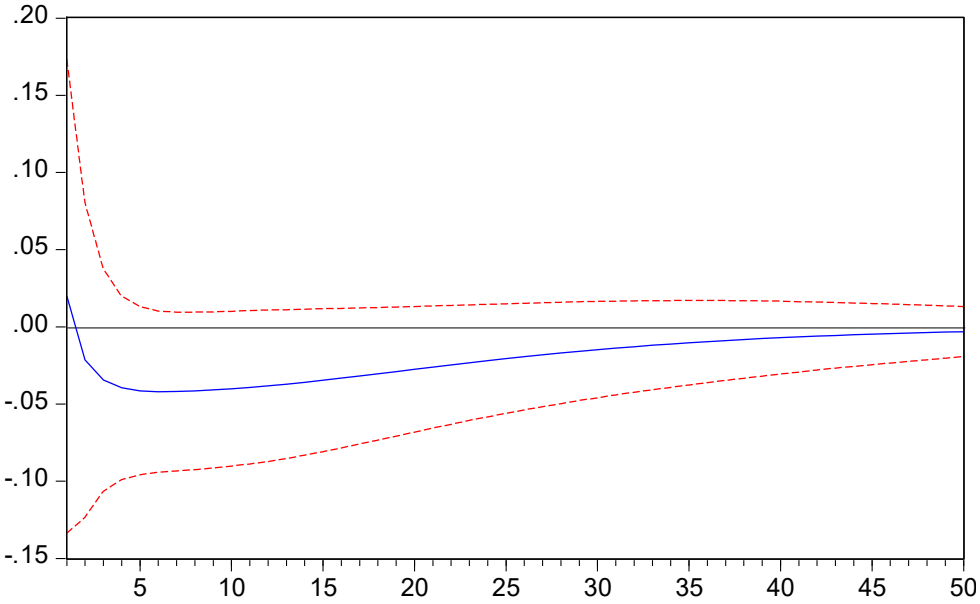
The figure presents the variation in both the federal funds rate and the natural interest level (two-sided) estimated by Laubach and Williams (2003) from 1961 to 2017.

Figure 2 Time variation in both general and monetary policy uncertainties



The figure presents the 12-month rolling averages of the general policy uncertainty and the news-based monetary policy uncertainty proxies developed by Baker et al. (2016) from 1986 to 2017. Both proxies are adjusted to have a mean level of 100. Please refer to Appendix 1 for an accurate description of these proxies.

Figure 3 Response of the M&A activity to the innovation in the federal funds rate



The figure presents the response of the natural logarithm of the dollar value of the quarterly M&A activity to one cholseky innovation in the federal funds rate from the VAR model presented in Section 4. The impulse response has the following ordering of the variables: Fed, ΔCAPE, Leading Index, MPU, Policy Uncertainty, GDP, and ln(M&A Value). It is worth noting that the pattern of the impulse response is invariant to the ordering of the variables.