Shocks to CEO Overconfidence and the Deflation of Hubris in Acquisitions*

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Abstract

CEOs become less overconfident when other CEOs to whom they are connected are fired unexpectedly, and this reduces hubris in corporate acquisitions. CEOs are less likely to hold vested deep in-the-money options in the year after which they experience this network turnover shock, and these turnover shocks make them more likely to abandon a previously announced but yet to be completed acquisition. In the year following unexpected turnover in their networks, CEOs make fewer acquisitions, and the ones they make are of higher quality. Network turnover shocks cause temporal variation in CEO overconfidence that has significant effects on corporate policy.

Key words: CEO overconfidence, hubris, unexpected CEO turnovers, network, acquisitions, availability heuristic

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1. Introduction

Recent research has shown that CEO overconfidence – the tendency of CEOs to overestimate future returns on their corporate investments – has a significant effect on their preferred corporate policies (e.g., Malmendier and Tate, 2005, 2008; Hirshleifer, Low and Teoh, 2012; Ferris, Jayaraman, and Sabherwal, 2013). These findings are often associated with two additional empirical inferences. The first is that CEO overconfidence is fixed, perhaps influenced by early life experiences (Malmendier, Tate and Yan, 2011). The second is often the implicit or explicit conclusion that the association between overconfidence and corporate policy is not due to matching between firm and CEO characteristics. In this study, we provide new evidence that CEO overconfidence can vary significantly over time and that this temporal variation has a pronounced economic impact on a CEO's preference in corporate policy. In doing so, we provide fresh support for the argument that the impact of overconfidence on corporate policy is not merely an artefact of CEO-firm matching.

While there is little doubt that each individual CEO has an innate baseline level of confidence as established by prior literature, we propose that, like other economic actors, these executives' outlook and judgement will be affected by recent and proximate events in their lives due to the availability heuristic (e.g., Tversky and Kahneman, 1973; Thaler, 2016; Malmendier and Nagel, 2016). This means that their level of confidence will change over time. We identify an event that, by its nature, is likely to affect the degree of overconfidence of individual CEOs: the unexpected firing of another CEO to whom they are socially, or professionally connected. The shock of seeing their friends fired (which we term a *network turnover shock*) serves as a grim and easy to recall event that reminds CEOs, who are subject to the availability heuristic, of the precariousness of their own positions. This deflates their overconfidence and tempers their estimates of the returns from future

corporate acquisitions. We find evidence that network turnover shocks do indeed have a sharp and immediate effect on CEO overconfidence. For example, CEOs are less likely to hold vested deep in-the-money options in the year after which they experience this network turnover shock. This suggests that they become less bullish on their companies' prospects in the period immediately after experiencing a network turnover shock.

We next examine whether or not, and the extent to which, network turnover shocks and time-varying CEO overconfidence matter for corporate policy. Specifically, we study firms' merger and acquisition activity which prior research has suggested to be strongly associated with CEO overconfidence (e.g., Roll, 1986; Billett and Qian, 2008; Malmendier and Tate, 2008; Ferris, Jayaraman, and Sabherwal, 2013). We find that in the immediate aftermath of observing the unexpected firing of a network connection, CEOs are more likely to abandon a previously announced but yet to be completed acquisition. In the year following the network turnover shock, CEOs make fewer acquisitions, and the ones they make are of higher quality as indicated by higher announcement returns around the acquisitions that they pursue.

These results also allow us to provide novel evidence to support the conjecture that the association between CEO overconfidence and corporate policies is not due to the matching between certain types of CEOs and firms. It is intrinsically difficult to rule out this CEO-firm matching explanation empirically. One way prior research has attempted to address this issue is by using firm fixed effects, and examining the difference in corporate policies with different CEOs at the same firm. However, this approach to identification does not fully address the possibility that firm characteristics change over time and that CEOs with different qualities may be matched to the same firm at different times over the firm's life cycle. Our approach overcomes this concern by studying the association between

overconfidence and corporate policy using changes in overconfidence *within* the *same* CEO at the *same* firm. The unexpected firing of another CEO in the focal CEO's network is exogenous since it is unlikely that the termination of the focal CEO's friend is due to choices that the focal CEO or her firm makes.

Why do we think *network turnover shocks* will affect CEO overconfidence and subsequent corporate acquisition policy? Our interest in this question is motivated by three strands of the literature. First, there is an increasingly rich literature showing that managers' social and professional networks are especially important in how they choose their own policies. Ample evidence suggests they often imitate and deploy corporate policies similar to those of network peers. For example, using the random assignment of Harvard Business School MBA classes, Shue (2013) shows that firms' policies and outcomes are very similar when their executives are socially connected, a finding confirmed in a broader sample by Fracassi (2017). Kaustia and Rantala (2015) document that firms are more likely to split their stocks when firms with which they share common analysts have recently done so. Jiang, Kubick, Miletkov, and Wintoki (2018) find that firms whose directors are connected to peers associated with tax havens are more tax-aggressive. Kleiner, Stoffman, and Yonker (2021) demonstrate that individuals' decisions regarding whether or not to file bankruptcy are heavily influenced by their peers' experiences with the bankruptcy process. These findings suggest that shocks to, or personal events in the lives of, individuals in managers' networks can be especially salient to those managers and strongly influence their own behavior.[1]

[1] Other papers examine the importance of executive networks in different contexts. Cohen, Frazzini, and Malloy (2008) show that mutual fund managers perform better when trading stocks of firms at which classmates from the same university serve as directors. Akbas, Meschke, and Wintoki (2016) show that information diffuses to informed traders through directors' networks. Larcker, So, and Wang (2013) show that

Second, a well-established literature in psychology shows that human beings are subject to the availability heuristic or availability bias (Tversky and Kahneman, 1973). Thaler (2016) notes that the availability heuristic often leads economic agents to base their estimates of the prevalence and possibility of an event by relying on instances of related events that are easier to recall. For example, Elia, Larsen, and Piscitello (2019) show that managers who have recent positive (negative) experience with a particular foreign investment strategy are likely to continue with (change) this strategy regardless of the prevailing circumstances, and that this relation is stronger when the antecedents are more recent. Consumer behavior research has shown that recent and easier to recall positive (negative) experience among consumers tends to decrease (increase) their perception of the risk of buying a product (Folkes, 1988; Wiles, 2007). Malmendier and Nagel (2016) find that the availability heuristic leads individuals to overweight their own personal experiences of inflation relative to more distant historical inflation data when forming their expectations of future inflation. Along similar lines, prior research finds that individuals connected to many unemployed people tend to overestimate the unemployment rate, and vice versa (Nisbett and Ross, 1980). In addition, Bikhchandani, Hirshleifer, and Welch (1992) show that economic agents are likely to behave based on their observations of others' actions and

firms with directors who are more central in their networks tend to earn superior risk-adjusted returns. Chuluun, Prevost, and Puthenpurackal (2014) show that better connected firms are associated with lower bond yields. Kinnan and Townsend (2012) demonstrate that financial networks can facilitate access to financing. Social ties with firm executives increase outsiders' chance of being appointed as directors on the firms' boards (e.g., Fracassi and Tate, 2012; Berger, Kick, Koetter, and Schaeck, 2013). Furthermore, such ties can reduce boards' monitoring effectiveness (e.g., Hwang and Kim, 2009; Nguyen, 2012; Schmidt, 2015). Ouimet and Tate (2020) show that coworkers' choice exert a significant influence on employees' decisions to trade their own employee stock purchase plans. The role that peers play in shaping economic behaviors also prevails among fund managers such that their trades tend to be similar when they are socially connected (Pool, Stoffman, and Yonker, 2015), and among analysts such that their performance is related to that of their peers (Do and Zhang, 2020).

experience, even without regard to their own information. In our context, availability heuristic means that the unexpected firing of a CEO in the focal CEO's networks may especially increase their sense of the precariousness of their own positions, which magnifies their perception of the potential negative consequences of making a failed acquisition.

The third strand of literature we draw on is empirical research that shows that CEOs are indeed more likely to be fired after poor acquisition performance. Lehn and Zhao (2006) study CEO turnovers around firm acquisition activities and find that CEOs are more likely to be replaced after making bad acquisition bids. Jacobsen (2014) finds that CEOs who protect shareholder interests by not increasing offer prices are less likely to be replaced and have better career prospects. These findings suggest that CEOs are likely to be aware that a failed or unsuccessful acquisition can have significantly negative consequences for their own positions in the firm.

The findings from these three strands of the literature suggest that CEOs' overconfidence in corporate acquisitions will be deflated when they are reminded about the possibility of getting fired. Forced CEO turnover events within a CEO's network provide vivid episodes which remind the CEO of the risk of making a poor acquisition. Influenced by the availability heuristic, CEOs may pause what could potentially be a risky corporate strategy (i.e., acquisitions). We predict that CEOs who are connected to other firms whose CEOs are fired become less overconfident and subsequently make fewer acquisitions.

We use a sample of forced CEO turnovers among firms covered by ExecuComp to test our conjectures. To sharpen the forced turnover measure, we exclude the turnovers of CEOs whose firms' stock returns are in the lowest quartile of their industry. Turnovers that are not accompanied by very poor performance are more likely to be unexpected, and are thus more salient shocks to other executives connected to the firms with such fired CEOs.

We start our analyses by examining the effect of network turnover shocks on a widely used measure of CEO overconfidence: the tendency of overconfident CEOs to hold vested deep in-the-money options. Malmendier and Tate (2005) propose and find evidence that managers who have not exercised vested and highly in-the-money stock options display an extreme degree of overconfidence in their company's prospects. We find that in the year after CEOs experience a network turnover shock, they are significantly less likely to hold vested highly in-the-money stock options. This provides initial evidence that the mechanism by which network turnover shocks alters CEO behavior is by its direct effect on CEO overconfidence.

We then turn to examining the direct effect of network turnover shocks on CEO overconfidence in corporate acquisition policy. We start with the most temporally proximate sample to the network turnover shock: firms that have already announced but not yet completed acquisitions at the time they experience the shock. We find that among firms that have announced an acquisition, the odds of withdrawing the acquisition bid among those managed by CEOs who experience a network turnover shock is over six times more than that of other firms if the CEO experiences a network turnover shock after announcing the acquisition. This finding is robust to controlling for industry, year, and a slate of other firm characteristics. Therefore, even in the more limited sample of CEOs who have already announced an acquisition, the shock of seeing a network peer fired appears to have a sharp and immediate dampening effect on CEO confidence and their propensity to complete acquisitions.

We next explore the impact of CEO network turnover shocks on the firm's acquisition activity more generally. To ensure that our findings are not driven by a particular chosen proxy, we employ four different measures of acquisition activity: deal

value (as a percentage of a firm's assets), book value of acquisition expenses (as a percentage of a firm's assets), the log of the number of acquisitions, and a binary variable for whether or not a firm initiates an acquisition. Our results indicate that firms are statistically and economically less likely to make, or spend on, acquisitions after their CEOs experience network turnover shocks. Specifically, in the year after which a CEO experiences at least one network turnover shock, our models indicate that her firm decreases the value of acquisition deals made by 57%, the book value of its acquisition expenses by 34%, the number of acquisition bids by 31%, and the odds of initiating acquisition bids by 33%, respectively, when compared to the average firm in our sample.

A potential implication or extension of deflated CEO overconfidence is that the likelihood of a CEO making a value-destroying acquisitions or overpaying for acquisitions will be reduced. This conjecture means that, within the distribution of acquisitions announced by CEOs who have experienced network turnover shocks, lower quality acquisitions will be truncated. Thus we expect acquisitions made by CEOs who have experienced network turnover shocks to be associated with higher intrinsic values and result in more value creation for acquirer shareholders. We test and find evidence to support this conjecture. Specifically, we find that acquirer announcement returns are higher among deals announced by CEOs who have experienced a network turnover shock in the previous year.

Our findings provide evidence that experiencing network turnover shocks curbs CEOs hubris in making acquisitions. There are, however, at least two potential alternative explanations for our findings. The first alternative explanation arises from the possibility that CEOs are more likely to be connected to people in their own industry. While we restrict our network turnover shocks to those that are unexpected (based on the fired CEO's past performance), a network turnover shock may simply signal something about an industry-

wide phenomenon (such as a downturn). As such, the CEO who experiences the network turnover shock may reduce her firm's acquisition activity in response to this general industry downturn (which may coincide with the shock) rather than to any behavioral effects from the network turnover shock itself. There are at least three reasons why we believe this alternative does not explain our results. We include industry fixed effects across our specifications which means that our findings hold even within industry. In addition, in a robustness test, we drop all network turnover shocks emanating from firms within a CEO's own industry and find that outside-industry network turnover shocks continue to predict a subsequent reduction in acquisition activity by that CEO. Lastly, we perform an additional robustness test in which we include industry-by-year fixed effects and continue to find a negative relation between network turnover shocks and subsequence acquisition activity. This further alleviates the concern that our results may be driven by industry effects.

A second alternative explanation is that the reduction in CEO acquisition intensity that we document may simply be the result of reductions in acquisitions among peer CEOs. CEOs may take their cues from their peers and reduce their acquisition activity when peer CEOs do so. If reductions in peer acquisition activity merely coincide with network turnover shocks, it is difficult to pin down whether our finding is the result of peer acquisition reductions or network turnover shocks. We find results that lead us to discount this potential alternative explanation. We find that network turnover shocks continue to predict a subsequent reduction in acquisition activity even when we account for the average number of acquisitions across all the firms managed by executives connected to the CEO experiencing the network turnover shock.

While our results clearly show that network turnover shocks have a significant effect on CEO behavior in the period immediately after CEOs experience these shocks, a question

that naturally arises is whether these shocks permanently alter CEO behavior. As such, one alternative mechanism that may explain our findings would be that CEOs learn from the valuation mistakes of the fired CEOs and that this learning leads to subsequent and permanently altered CEO valuation of acquisitions. This would be in contrast to our maintained hypothesis that network shocks lead to temporal variation in CEO hubris due to the proximity of these events in the CEO's life (i.e., the availability heuristic). Our additional analyses suggest that network turnover shocks can reliably predict reductions in firms' acquisition intensity for only one to three years after the shock. This finding provides further support for our idea that the mechanism at work here is, as we propose, a sharp and immediate effect on CEO overconfidence arising from the availability heuristic rather than merely reflecting a form of learning about how to value acquisitions.

Besides contributing to the debate on the economic effects of CEO overconfidence, we make at least two additional contributions to the literature. First, we introduce a new factor that mitigates and causes temporal variations in CEO overconfidence: turnover shocks among CEO networks. The common assumption in most of the current literature is that CEO overconfidence is an innate characteristic that does not vary significantly over time. Our findings shed light on this matter by showing that the level of CEO overconfidence is time-varying, and that this temporal variation has significant implications on corporate policies. Second, we illustrate a novel way by which CEO networks can influence acquisition decisions and performance. Prior research has shown that connections through executives' networks affect the outcomes of acquisition bids. Cai and Sevilir (2012) show that acquirers earn higher announcement returns when their directors are connected with the targets' directors. Schmidt (2015) finds that firms with more CEO–director connections experience higher bidder announcement returns when the potential value of

board advice is high. El-Khatib, Fogel, and Jandik (2015) find that CEOs with more central networks are more likely to make acquisition bids and these transactions are more likely to be value destroying. We show that CEO networks provide a channel through which CEOs are indirectly and inadvertently monitored by vivid reminders stemming from negative job consequences among their network peers. This channel reduces CEO hubris in acquisitions and encourages CEOs to pursue value-enhancing acquisitions.

2. Data and sample selection

We obtain data on forced CEO turnovers from Peters and Wagner (2014) and Jenter and Kanaan (2015).[2] This dataset identifies all forced CEO turnovers among firms covered by ExecuComp for the period between 1993 and 2016.[3] We then re-match the forced CEO turnover information from this dataset with the full sample of all ExecuComp firms to identify whether or not a CEO is forced to leave. We treat all firm-years in ExecuComp without a match in this dataset as either having no CEO turnover or having a turnover that was voluntary in nature. We also obtain options compensation holding information for executives from ExecuComp.

We then collect data from BoardEx to construct each executive's network. BoardEx keeps records of all the top executives and directors of the firms they cover and we use BoardEx to identify all the individuals with whom each person is directly connected. We impose three criteria for identifying an individual's connections. For each individual-year, we require: (i) that the connection have been established prior to that year; (ii) the two

[2] We thank Florian Peters and Alexander Wagner for generously sharing their forced CEO turnover data.

[3] As discussed in Peters and Wagner (2014) and Jenter and Kanaan (2015), they identify forced CEO turnovers based on press coverage and the replaced CEOs' ages. Interested readers should refer to these papers for further details.

individuals share overlapping experience in an institution; and (iii) that the connections have been established through institutions outside of an individual's own current firm. These requirements ensure that the connections we identify are pre-existing and are not with an individual's colleagues in the same firm. BoardEx's coverage starts from 2000. Given that the forced CEO turnover data we employ in our analyses ends in 2016, we obtain BoardEx data for the years between 2000 and 2016. We next collect information on companies' acquisition deals from the Securities Data Company (SDC) database. For each deal, we obtain the identity of the acquirer and the target, deal announcement date, deal effective date (if completed), deal withdrawn date (if withdrawn), deal value, whether or not the target is a publicly traded company, and the payment structure.

Throughout our analyses, we also deploy a variable from prior literature that is frequently used as a proxy for the underlying level of CEO overconfidence based on the idea from Malmendier and Tate (2005) that managers who have not exercised vested and highly (at least 67%) in-the-money stock options are displaying an extreme degree of overconfidence. We use this proxy in two guises in different aspects of our analyses. First, we utilize the variable as *Holder 67 Annual* with a value of one (zero, otherwise) if, in that year, the firm's CEO holds vested options that are at least 67% in-the-money. Second, we deploy the variable as *Holder 67* with value of one if a CEO has held options on her firm's stocks that are at least 67% in-the-money at least twice in the past.[4] Prior research has shown that this variable is associated with firm acquisition activity (Malmendier and Tate, 2008).

[4] As discussed in Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011), the measure in Malmendier and Tate (2005) is constructed based on proprietary data. We thus construct the variable *Holder 67 Annual* and *Holder 67* based on ExecuComp data following the method outlined in Campbell, Gallmeyer, Johnson, Rutherford, and Stanley.

Following the literature, we construct various additional control variables using data from Compustat. *Firm Size* is defined as the natural logarithm of total assets; *Market-to-Book* is the market value of equity divided by the book value of equity; *Profit* is EBITDA divided by total assets; *Cash* is cash and cash equivalents standardized by total assets; *Leverage* is book value of total debt divided by the sum of market value of equity and book value of total debt; *Liquidity* is net operating cash flows standardized by total assets, and *Tangibility* is total PPE expenses divided by total assets. We also obtain firms' acquisition expenses from Compustat. We use stock daily returns from CRSP to calculate abnormal acquisition announcement returns.

After combining all datasets, our final sample has 11,162 firm-year observations that include data from the years between 2000 and 2016. We winsorize all continuous variables at the 1st and 99th percentiles to remove possible impacts from outliers.[5] We present the summary statistics for our key variables in Table 1.

3. Defining network turnover shocks: forced CEO turnover in a CEO's network

We define our main variable of interest – *Network Turnover Shock* – based on the incidences of unexpected forced CEO turnovers in a CEO's network. For each firm-year, we first identify all forced CEO turnovers that occur to other CEOs in the focal CEO's network of firms. A large portion of forced CEO turnover is due to poor performance, so we further divide these turnover events into performance-related and non-performance-related CEO turnovers to sharpen the identification of unexpected turnover shocks. Specifically, we calculate the annual stock returns for all firms in our sample and compare each firm's fiscal year return with other firms in the same industry (defined based on the Fama-French 48

[5] Our results are similar without winsorization.

industry classifications). If a firm's performance is in the lowest quartile in the industry and its CEO is forced to leave, we categorize this turnover as a performance-related turnover. Otherwise, we treat the CEO turnover as non-performance-related turnover.[6] To exclude the impact of performance-related CEO turnovers, we consider only non-performance-related forced CEO turnovers in our main analysis. In other words, our key measure of network turnover shock reflects unexpected forced turnovers from the perspective of the CEO who experiences it.

Based on this classification, we create a continuous variable, *Network Turnover Shock*, which measures the frequency of such forced CEO turnover events in a CEO's network while also considering the strength of connections. We start by identifying the other CEOs that form part of a focal CEO's network. A CEO can be part of a focal CEO's network in one of two ways. First, the CEO can be directly connected to a focal CEO by having been associated with the same organizations in the past (as described in Section 2). Second, the CEO can be connected to the focal CEO by being the chief executive of a firm in which the focal CEO has a direct connection to at least one of the other executives or directors in the firm. To measure the strength of connections between the focal CEO and each of the CEOs in her network, we divide the number of connections the focal CEO shares with a connected CEO's firm by the total number of such connections the focal CEO has. We define this $connection\ strength_{i,j,t}$ as follows:

$$connection\ strength_{i,j,t} = \frac{number\ of\ connections_{i,j,t}}{\sum_{j=1}^{n} number\ of\ connections_{i,j,t}} \quad (1),$$

where i is the focal CEO, j is the connected CEO, n is the number of connected CEOs to CEO i, $number\ of\ connections_{i,j,t}$ is the number of connections between i and j, and t

[6] Using industry median performance to define performance-related turnovers yields to similar results.

represents the year. We then define *forced CEO turnover*$_{j,t}$ as a binary variable with a value of one if the CEO in firm j is forced to leave in year t due to non-performance related reasons (as discussed above) and zero otherwise. Accordingly, *Network Turnover Shock*$_{i,t}$ for the focal CEO i is defined as follows:

$$\textit{Network Turnover Shock}_{i,t} = \sum_{j=1}^{n} (\textit{connection strength}_{i,j,t} \times \textit{forced CEO turnover}_{j,t}). \quad (2)$$

The idea with using connection strength is to capture the notion that the more connections a focal CEO shares with her connected CEO, the more salient the unexpected firing of the connected CEO will be. To complement this continuous variable and assure robustness, we also define and utilize a simpler binary variable, *Network Turnover Shock (Dummy)*, which takes a value of one when there is at least one non-performance related forced CEO turnover in a CEO's network, has a value of zero otherwise, and ignores the strength of the connections.

4. Network turnover shocks and CEO holdings of deep in-the-money options

We begin our empirical analysis by examining the effect of network turnover shocks on CEO holdings of vested deep in-the-money options on their own company stock which prior research has established as a measure of CEO overconfidence. For this part of our analysis, we use the variable, *Holder 67 Annual*, that takes a value of one if the CEO holds vested options that are at least 67% in-the-money in that year (and zero, otherwise), as defined in Section 2.[7]

[7] For our purpose in this test, we need to employ an overconfidence measure that varies over time. Accordingly, we use *Holder 67 Annual*, a variation of the original measure *Holder 67*, which classifies a CEO as overconfident for all years after the first year that CEO is classified as overconfident and thus does not vary over time (Malmendier and Tate, 2005).

Before performing a multivariate analysis, we note that casual observation of the data reveals a tendency for CEOs to reduce their holdings of vested deep in-the-money options after experiencing a network turnover shock. Specifically, we examine the year before and the year after CEOs experience a network turnover shock, and compare the percentage of CEOs who hold vested deep in-the-money options in these two years. We summarize the findings in Figure 1. As shown, among the treated firms (i.e. those with CEOs that experience a network turnover shock), 30% of the CEOs hold vested deep in-the-money options in the year before the shock and this percentage falls to 26% after the shock, with the difference being significant at the 1% level. This provides the first indication that network turnover shocks affect CEO overconfidence.

Next, we examine the effect of network turnover shocks on holding of vested deep in-the-money options in multivariate context, controlling for the previous year's option holding as well as several other firm characteristics using the following specification:

$$\begin{aligned} \textit{Holder 67 Annual}_{i,t} &= \alpha + \beta \times \textit{Network Turnover Shock}_{i,t-1} + \rho \times \textit{Holder 67 Annual}_{i,t-1} \\ &\quad + \Gamma' \textit{controls}_{i,t} + \epsilon_{i,t}, \end{aligned} \tag{3}$$

where i represents firm i and t denotes year t.

We present the results from this analysis in Table 2 using three different variations of equation (3). In Column 1, we do not include any fixed effects. In Column 2, we include industry fixed effects, and we further add year fixed effects in Column 3 to account for the possibility that CEOs' decisions about their options are largely due to time-specific commonalities across all CEOs. As shown, the coefficient estimates on *Network Turnover Shock* are negative and statistically significant across all three specifications. These results provide additional evidence that CEOs are less likely to be overconfident (i.e., less likely to

hold vested deep in-the-money options on their own firms' stocks) after experiencing network turnover shocks.

One of the potential implications of the availability heuristic is that the impact of network turnover shocks should be temporary or short-lived. The availability heuristic suggests that the shock may have its biggest impact on the manager when it is easiest to recall (i.e., in the immediate aftermath of the shock) and that its effect may be diminished as the event recedes further into the past. We examine this implication by tracking the differences in the holdings of vested deep in-the-money options between firms whose CEOs experience a network turnover shock and those of other firms from two years before the shock until four years after the shock, i.e., in a [-2, +4] window around the shock which happens in year 0. We perform this set of tests using the specification in equation (3), with year and industry fixed effects, and summarize the results in Figure 2, in which we plot the estimates of β. The figure shows that in the years leading up to the network turnover shock, there is no significant difference in the holding of vested deep in-the-money options between CEOs experiencing the shock and others. However, in the year immediately following the network turnover shock, firms with shocked CEOs are less likely to hold vested deep in-the-money options. Following the shock, *Holder 67 Annual* is about ten percentage points lower in treated firms than in other firms. We also observe that across the entire [-2, +4] window, the difference in *Holder 67 Annual* between CEOs experiencing a network turnover shock and others is largest, and significantly different from zero, only in the year immediately following that in which the network turnover shock occurs. These findings suggest that network shocks have a sharp and immediate effect on the holdings of vested deep in-the-money options by CEOs who experience such shocks. The figure also shows that the effect

of the shock on managerial overconfidence wanes and may diminish over time, consistent with the predictions of the availability heuristic.

5. Network turnover shocks and corporate acquisition policy

5.1 Network turnover shocks and the withdrawal of announced acquisitions

We hypothesize that CEOs are less likely to make acquisitions when there are forced CEO turnovers in their networks due to worries that poor acquisition outcomes will lead to their own forced departures from their jobs. We start this aspect of our empirical analysis by looking at a small but potentially revealing sample: CEOs who have already announced acquisitions that are yet to be completed. While announced bids can be withdrawn for several reasons, our hypothesis predicts that we should observe a higher likelihood of bids not going through completion among firms whose CEOs experience a network turnover shock after they announce a bid.

As we note in Section 2, we collect data on all announced acquisition bids during our sample period and identify the announcement, effective, and withdrawn dates. For each acquisition bid, we treat it as experiencing a network turnover shock if there is at least one forced CEO turnover in the acquirer CEO's network between the acquisition announcement date and the withdrawal date (for withdrawn deals) or the effective date (for completed deals). This setup ensures the relevance of forced CEO turnovers in the network to a firm's decision to withdraw an acquisition bid. We define a binary variable *shock* with a value of one for acquisition bids from firms whose CEOs experience such shocks, and zero otherwise. We then estimate the following specification at the deal-level to test whether experiencing such a shock increases the odds of withdrawing announced acquisition bids:

$$withdrawn_{i,t} = \alpha + \beta \times shock_{i,t} + \Gamma' controls_{i,t-1} + \epsilon_{i,t}, \tag{4}$$

where *withdrawn* takes a value of one if an announced acquisition bid is withdrawn by the acquirer, and zero otherwise. The decisions to withdraw acquisition bids may cluster by industry or tend to happen together in certain years. We thus control for industry and year fixed effects to address these possible concerns. If such shocks lead CEOs to withdraw announced acquisition bids, we should observe a positive coefficient estimate for β.

We present the results of estimating equation (4) in Table 3. Column 1 shows the results from a parsimonious model without control variables. The coefficient estimate on *shock* is 1.936 and is significant at the 1% level (t-stat = 2.988). This coefficient estimate indicates that the odds of withdrawing an announced acquisition bid is about seven times higher if the potential acquirer's CEO experiences a forced CEO turnover shock in her networks. The results are similar after we include a slate of control variables that may possibly affect an acquirer's decision to withdraw a bid. As documented in column 2, even after controlling for these possible factors that affect the probability of deal withdrawals, the odds of withdrawing an announced acquisition is still over six times higher if a CEO experiences a network turnover shock (coefficient estimate on *shock* = 1.849 with a t-stat of 2.352). These findings indicate that there is a statistically and economically significant positive relation between forced CEO turnovers in the focal CEO's network and the focal firm's decision to withdraw an acquisition bid.

The results in Table 2 suggest that network turnover shocks have a sharp and immediate dampening effect on CEO hubris and appetite for corporate acquisitions. While this inference is drawn from a relatively small sample of CEOs who already choose to make an acquisition before experiencing the shock, it provides initial evidence to indicate that network turnover shocks curb CEOs' appetite for acquisitions.

5.2 Network turnover shocks and firms' subsequent acquisition activities

We next turn to broader tests of our hypothesis that firms are less likely to subsequently engage in acquisitions if their CEOs experience a network turnover shock. We use four proxies to measure a firm's acquisition activity intensity. First, we define *Deal Value* as the total dollar value of acquisition bids announced in a year divided by the firm's total assets in the same year. Second, we define *Acquisition Expenses* as the book value of acquisition expenses a firm reports on its 10-K filings divided by its total assets. Third, we count the number of acquisitions a firm makes in a year and define *log (# acquisition)* as the natural logarithm of one plus the number of acquisitions a firm makes in a year. Lastly, we define a binary variable *Acquirer* as having a value of one (zero, otherwise) for firms that make at least one acquisition in a year. Employing a variety of proxies for acquisition intensity allows us to test our hypotheses without being confined to a specific measure, thus enhancing the robustness of our findings.

5.2.1 Univariate differences in acquisition activity

We start by examining the univariate differences in each of our four proxies of acquisition intensity (discussed above) between the firms with CEOs who have experienced a network turnover shock and other firms. For each of our four proxies we track the differences in acquisition activity between firms whose CEOs experience a network turnover shock and those of other firms from two years before the shock until five years after the shock, i.e., in a [-2, +5] window around the shock which happens in year 0. We perform this set of tests using the following specification, for each of our four proxies for acquisition activity:

$$\textit{acquisition intensity}_{i,t} = \alpha + \beta_k \times \textit{Network Turnover Shock}_{\,i,t-k} + \epsilon_{i,t}, \quad k = -2,-1,0,1,...5, \quad (5).$$

We summarize the results from this analysis in Figure 3, in which we plot estimates of β_k. The figure shows that, across all proxies for acquisition activity and in the years leading up to the network turnover shock, there is no significant difference in acquisition activity between firms whose CEOs experience the shock and other firms. However, in the year immediately following the network turnover shock, firms whose CEOs are affected reduce their acquisition significantly when compared to other firms. Similar to what we find with CEO holding of vested deep in-the-money options in Section 4, across the entire [-2, +5] window, the difference in acquisition activity between firms whose CEOs experience a network turnover shock and other firms is largest in the year immediately following that in which the network turnover shock occurs. Network turnover shocks have a sharp and immediate effect on the acquisition activity of firms whose CEOs experience a network turnover shock.

5.2.2 Multivariate regression analyses

Using the four proxies for a firm's acquisition intensity discussed, we employ the following model to test, in a multivariate regression framework, our hypothesis that network turnover shocks reduce acquisition activity in the year following the shock:

$$acquisition\ intensity_{i,t} = \alpha + \beta \times Network\ Turnover\ Shock_{\,i,t-1} + \Gamma' controls_{i,t-1} + \epsilon_{i,t}, \quad (6).$$

Network Turnover Shock is as defined in Section 3. We control for underlying CEO overconfidence at the time of the acquisition, *Holder 67*, as defined in Section 2. Following the literature, we include a slate of other control variables (also discussed in Section 2) to account for other factors that may affect a firm's acquisition activities, and lag these control variables by one year (as in, for example, El-Khatib, Fogel, and Jandik, 2015).[8] We also

[8] We also performed analysis using concurrent control variables as a robustness check and find our inferences are unchanged.

control for industry and year fixed effects to address the concern that acquisition decisions among firms may cluster within industries and over time. A negative β would be consistent with our hypothesis that firms with CEOs who experience network turnover shocks are less likely to make acquisitions in the year following the shock.

Table 4 presents the results from this analysis. Panel A documents the results for specifications in which we use the continuous measure, *Network Turnover Shock*, to gauge the degree to which a CEO experiences forced CEO turnovers in her network. As shown, the coefficient estimates on *Network Turnover Shock* are negative and statistically significant across all specifications. This finding supports our hypothesis that CEOs tend to reduce acquisition activity after experiencing network turnover shocks. Panel B presents our analysis using *Network Turnover Shock (Dummy)*, the binary variable that indicates if there is any forced CEO turnover shock in the CEO's network, rather than the continuous measure. Similar to what we find in Panel A, all specifications in Panel B reveal that there is a statistically significant and negative relation between network turnover shocks and a firm's propensity to make acquisitions.

Our finding of a negative relation between network turnover shocks and a firm's acquisition intensity is not only statistically significant, but also economically meaningful. Specifically, the results based on the continuous measure in Panel A indicate that a firm, after its CEO experiences a one standard deviation increase in network turnover shocks, reduces its subsequent acquisitions by 7% based on *Deal Value*, and by 5% based on either *Acquisition Expenses*, *Number of Acquisitions*, or the odds of *Initiating Acquisitions*, when compared to the average firm in the sample. Similarly, the economic impacts of network turnover shocks on firms' acquisition intensity are meaningful when gauged by the findings based on the *Network Turnover Shock (Dummy)* in Panel B. After a firm's CEO experiences

a network turnover shock, it reduces acquisitions by 57% based on *Deal Value*, 34% based on *Acquisition Expenses*, 31% based on the *Number of Acquisitions*, and by 33% based on the odds of *Initiating Acquisitions*, when compared to the average firm in the sample.

Our results also reveal that, while innately overconfident CEOs make more acquisitions in general (the coefficient estimates on *Holder 67* are significantly positive in all specifications), our finding of a negative relation between *Network Turnover Shock* and firm acquisition activities are significant across all specifications even with the inclusion of this widely used measure of overconfidence. This suggests that, beyond, and in addition to, the baseline effects of CEO overconfidence on acquisitions documented in Malmendier and Tate (2008) and Ferris, Jayaraman, and Sabherwal (2013), recent network turnover shocks exert a marked and significant effect on a firm's acquisition activity.

5.3 Network turnover shocks and firms' subsequent acquisition performance

Our results show that CEOs become more restrained in making acquisitions after experiencing network turnover shocks. One implication of this (and one that potentially speaks to the mechanism underlying this behavior) is that this reduction in acquisition activity is mainly due to CEOs, being vividly reminded about the possibility of being fired, becoming less confident about their ability to create value from acquisitions and thus act more cautiously in making acquisitions. We thus expect that, following network turnover shocks, CEOs are not only less likely to overpay for the acquisitions that they make, they are also more likely to proceed with an acquisition bid only if they are extremely certain that it is a deal that enhances shareholder wealth. Accordingly, we predict that the acquirer announcement returns for acquisition bids should be higher among firms whose CEOs experience network turnover shocks.

We test this conjecture directly and present the results in Table 5. We calculate acquirers' 3-day announcement cumulative abnormal returns (CAR) for each of the deals in our sample and investigate whether deals announced by CEOs after they experience network turnover shocks tend to have higher announcement returns using the following model:

$$CAR_{i,t} = \alpha + \beta \times Network\ Turnover\ Shock_{\ i,t-1} + \Gamma' controls_{i,t} + \epsilon_{i,t}, \quad (7)$$

where i represents deal i and t denotes year t. We follow the literature and include a battery of control variables that prior research has shown to be associated with announcement returns (e.g., Field and Mktchyan, 2017; Custodio and Metzer, 2013). In Column 1, we include firm-level controls, and in Column 2, we include several additional controls for corporate governance and deal-level characteristics (which consequently results in a smaller sample).

Across both specifications, the coefficient estimates on *Network Turnover Shock* are positive and significant. Deals announced by CEOs who have experienced network turnover shocks earn higher announcement returns even after controlling for other potential determinants of merger and acquisition announcement returns. These findings indicate that network turnover shocks reduce CEO acquisition activity by reducing overconfidence such that CEOs truncate lower quality acquisition bids. The results suggest that these shocks essentially constitute an exogenous form of CEO monitoring, particularly when it comes to the firm' investment in acquisitions.

5.4 Network turnover shocks and financial constraints

Firms often reduce investments when facing financial constraints and have to forgo investment projects accordingly (e.g., Campello, Graham, and Harvey, 2010). The presence

of significant financial constraints raises the stakes to CEOs of getting an acquisition wrong. In other words, given that acquisitions are often sizeable investments, the risk to the CEO's position from making a poor acquisition decision is likely to be especially high in firms facing significant financial constraints. As we have already uncovered, network turnover shocks reduce CEO hubris by making the precariousness of their own positions salient. We expect the effects of network turnover shocks on CEO overconfidence in corporate acquisition behavior to be stronger among firms with higher degrees of financial constraints.

We test this possibility by regressing our four measures of a firm's acquisition activities on network turnover shocks, a proxy for financial constraint (*SA Index*, defined as in Hadlock and Pierce, 2010), the interaction between these two variables, as well as other control variables described in Section 2. We present the results in Table 6. First, as expected, the coefficient estimates on *SA Index* are negative, indicating that financially constrained firms tend to make fewer acquisitions in general. More importantly, we find that the coefficient estimates on the interaction between network turnover shocks and financial constraint are negative and significant in three out of the four models. These findings provide evidence that the restraining effect that CEO network turnover shocks have on firm acquisition intensity is even stronger among firms that are more financially constrained.

6. Alternative explanations, robustness tests, and additional analyses

6.1 Acquisition intensity among connected firms

Our finding is that firms with CEOs who experience network turnover shocks are less likely to make acquisitions. One alternative explanation of our finding is that it is not a result of CEOs' reduced appetite for acquisitions due to network turnover shocks, but a

reduction in acquisition activities among other connected firms in their networks, in general, that just happen to coincide with network turnover shocks. As we note in the Introduction, a growing literature shows that firms' decisions are closely related to, and are heavily influenced by, those of their peer firms. If an unexpected CEO turnover within a CEO's network firms coincides with a large number of firms within the CEOs' network reducing their acquisition activity, it is possible that the negative relation we document between network turnover shocks and acquisition activity is due to a coincidental general reduction in acquisition intensity among connected firms.

We explore this alternative explanation by estimating the effect of network turnover shocks on acquisition activity, while directly controlling for acquisition intensity among all the firms to which the CEO is connected. Specifically, we create a variable, *Network Acquisition Intensity* that measures the average acquisition intensity (based on the four proxies for acquisition activities defined previously) among all the firms to which the CEO is connected. We present our results in Table 7. As shown, we find that the coefficient estimates on *Network Turnover Shock* remain negative and statistically significant in all cases even after controlling for this *Network Acquisition Intensity*. These findings suggest that while focal firms' acquisition decisions may be influenced by connected firms, our finding that network turnover shocks tend to reduce CEOs' acquisition intensity remains unchanged.

6.2 Forced CEO turnover due to poor performance and acquisition intensity

As discussed in the Introduction and in Section 3 where we describe the construction of the key variables of interest, we sharpened our definition of network turnover shocks by excluding forced CEO turnovers associated with recent poor performance. Our motivation

for this choice is that turnovers associated with poor performance are more likely to be expected and are less likely to constitute a shock. In this subsection, we relax this assumption and consider the empirical question of how including CEO turnover associated with poor performance affects our inference.

We directly control for forced CEO turnover associated with poor performance in our estimates of the effect of network turnover shocks on acquisition activity using the model specified in equation (6). To capture CEO turnovers associated with poor performance, we create a variable, *Network Performance Turnover*, following the same procedure in which we construct *Network Turnover Shock* as discussed in Section 3, but limiting turnovers to those associated with firms whose stock return performance is in the bottom quartile of the industry in the year leading up to the shock. We present our results in Table 8. As shown, the coefficient estimates on *Network Performance Turnover* are mixed; they are insignificant in columns 1 and 2 (when our measures of acquisition activity are deal value and acquisition expenses respectively), and negative in columns 3 and 4 (when our measures of acquisition activity are the log of the number of acquisitions and whether or not the firm initiates an acquisition). However, most importantly, our inference with respect to *Network Turnover Shock* is unchanged: the estimates in all four columns remain negative and significant. Therefore, while there is mixed evidence that CEOs may reduce acquisition activity after observing a CEO in their network being fired specifically following poor performance, our inference that network turnover shocks which are not associated with poor performance lead CEOs to reduce their acquisition intensity remains unchanged.

6.3 CEO's network turnover shocks vs those of other directors

Our contention thus far is that the mechanism by which network turnover shocks affect a company's acquisition activity is through its effect on the CEO's confidence, rather than on its effect on any other directors or corporate officers. However, Ellis, Guo, and Mobbs (2021) show that directors who experience forced CEO turnovers on a board on which they sit become stricter monitors of CEOs at other firms where they also serve as directors. This finding suggests an alternative channel by which forced CEO turnovers impact a firm's acquisition behavior: the influence may materialize via its effect on the monitoring behavior of the firms' directors. Thus, an alternative explanation for our findings is that when a firm's directors experience a CEO turnover in their own networks, they become stricter in monitoring their CEOs and restrain their CEOs' acquisition behavior. The increased director monitoring channel may simply be coincident with the CEO's own network turnover shock.

We explore this alternative explanation and attempt to disentangle the director monitoring mechanism from the CEO hubris deflation mechanism. We do this by directly controlling for forced CEO turnovers in directors' network firms in our estimates of the effect that CEO network turnover shocks have on firm acquisition activity. Following a similar procedure to that by which we create the *Network Turnover Shock* variable for CEOs, we construct a variable *Network Turnover Shock Directors* that captures the frequency of forced CEO turnovers (not related to poor performance) among all the executives in the networks of all the directors of the focal firm except the CEO. We present the results in Table 9. As shown, the coefficient estimates on *Network Turnover Shock Directors* suggest turnover shocks in directors' network do not appear to significantly affect subsequent firm acquisition activity. Furthermore, the coefficient estimates on *Network*

Turnover Shock remain negative and significant across all four specifications. These results allow us to discount the alternative explanation that our finding is due to network turnover shocks in directors' networks. Instead, as we have documented in previous tests, it is shocks among CEOs' networks that lead to reductions in firms' acquisition activities.

6.4 Excluding network turnover shocks in the same industry

In our analyses thus far, we have included all forced CEO turnovers, including those in both the CEOs network *and* industry, in constructing our *Network Turnover Shock* variable. While we have generally restricted our sample of shocks to those that are not associated with poor firm performance, CEO turnovers of any kind could still be a harbinger of industry trends (e.g., a negative industry-wide shock, restructuring, or impending downturn). It is of course reasonable to expect that CEOs are often (and may be even more likely to be) connected to other executives and firms in their industries. Thus, an alternative explanation for our findings is that CEOs who experience a network turnover shock may simply be reducing their acquisition activity in response to a general industry downturn or restructuring that just happens to coincide with the shock, rather than due to any behavioral effects from the network turnover shock itself as we suggest.

In general, we have attempted to account for this possibility by including industry fixed effects across all our specifications through this paper such that our results are *within* industry. In untabulated results, we also confirm that our results are robust by including industry-by-year fixed effects, which ensures that we control for any industry trend in acquisition activities. In this section, we take a step further towards discounting this alternative explanation by reconstructing the *Network Turnover Shock* variable while explicitly excluding any such turnovers that happen in a firm from the same Fama-French

48 industry. We then replicate our analysis (i.e., that presented in Table 3) while using this new definition of network turnover shock. We report the results in Table 10. As shown, even though such an exclusion reduces the number of network turnover shocks (thus potentially making our estimates noisier), the coefficient estimates on *Network Turnover Shock* remain negative and significant in the first three specifications (in which our measures of acquisition activity are deal value, acquisition expenses, and the log of number of acquisitions, respectively). The coefficient estimate in the fourth specification (where our measure of acquisition activity is a binary variable for whether or not the firm initiates an acquisition) is also negative, although it falls just slightly short of significance at conventional levels. Taken together, these results support our hypotheses that firms whose CEOs experience network turnover shocks subsequently reduce their acquisition activity even when we limit our definition of network shocks to those associated with executives outside the CEO's own industry.

6.5 Excluding small deals

Our analysis thus far relies on a sample of acquisitions made by publicly traded firms. We do not exclude any deals as long as we have information about the deal announcement date, effective date (if completed), withdrawal date (if withdrawn), and deal value. This choice ensures that we capture as many acquisitions as possible and allows us to evaluate a firm's acquisition intensity as completely as possible. However, the literature shows that firms' acquisition decisions and performance may vary based on factors such as deal size (Netter, Stegemoller, and Wintoki, 2011; Fuller, Netter, and Stegemoller, 2002) and the M&A literature has often selected samples based on screens for size. In this subsection, we examine the extent to which screening our sample based on deal size affects our inference.

Table 11 presents the results from samples in which we exclude acquisition deals that are considered small. Studies in the literature have defined what constitutes a small deal in several ways. For example, Lehn and Zhao (2006) requires the deal value to be at least 10% of the size of the acquirer, and Jacobsen (2014) mandates the deal value to be at least $10 million. We thus use three different filters to remove small deals so that we can test the robustness of our results without subjecting us to specific thresholds. Panel A in Table 11 documents our results where we exclude deals in which the deal value is less than 5% of the acquirer's total assets, Panel B documents results without deals that are less than 10% of the acquirer's total assets, and Panel C reports results where deals with values of less than $10 million are excluded. As shown, our results and inferences are not affected by excluding small deals, regardless of which threshold we use. The coefficient estimates on *Network Turnover Shock* remain negative and significant in all cases.

6.6 How long does the impact from network turnover shocks last?

We find that firms are likely to reduce their acquisition intensity after their CEOs experience network turnover shocks because these shocks deflate CEO overconfidence. These shocks remind CEOs of the vulnerability of their own positions at least in the period immediately after this shock occurs. However, it is not clear how long this dampening effect that network turnover shocks have on CEO hubris in corporate acquisitions lasts. It is possible that this change in CEO behavior due to the availability heuristic fades over time, or that CEOs may permanently change their appetite for risky acquisition bids after experiencing network turnover shocks. Indeed one alternative hypothesis for our findings is what could be termed a "*permanent learning*" hypothesis: CEOs learn how to better value acquisitions from the mistakes of the fired CEOs and this learning leads to subsequent and

permanently altered CEO behavior. This would be in contrast to our maintained hypothesis that network shocks lead to temporal variation in CEO hubris due to the proximity of these events in the CEO's life. Thus, while our maintained hypothesis suggests an immediate impact on CEO behavior, we view the extent to which the effect of network turnover shocks last as an empirical question.

While noting that the univariate analysis in Figures 2 and 3 already suggests that the effects of turnover shocks on CEO behavior may fade as the shocks recede into the past, we explicitly test the duration of the impact of network turnover shocks on acquisitions by replicating the analysis specified in equation (6) with different network turnover shock horizons. We investigate the impact of network turnover shocks for up to six years by substituting *Network Turnover Shock* in year *t–1* in equation (6) by those in year *t–2, t–3, t–4, t–5,* or *t–6*, respectively. To alleviate the concern that there are overlapping effects, we drop observations in which there is at least one network turnover shock between year t and $t–x$ when evaluating the impact of such shocks in year *t-x*. We present the results in Table 12. As shown, the impact of network turnover shocks on firms' acquisition decisions is not permanent. The coefficient estimates on *Network Turnover Shock* remain negative and significant in all models in either or both years *t–2* and *t–3*, but not beyond. These results suggest that network turnover shocks can reliably predict reductions in firms' acquisition intensity for one to three years, and become obsolete after that. The results can be viewed as a rejection of the alternative "*permanent learning*" hypothesis and support our idea that the mechanism at work here is a sharp and immediate effect on CEO behavior arising from the availability heuristic, which fades as the shock recedes into the past.

6.7 Can network turnover shocks be predicted?

Our analyses thus far has based on the premise that network turnover shocks among CEO network firms are exogenous to CEOs and their firms. There are at least two reasons why we think this assumption is reasonable. First, network turnover shocks represent shocks to other CEOs in firms the focal CEO is connected with. It is unlikely that a focal firm's own historical acquisition choices or characteristics would affect the decisions to fire a connected firm's CEO. Second, we specifically exclude forced turnovers that are due to poor performance when defining network turnover shocks, meaning that we consider only forced CEO turnovers that are likely to be unexpected. This unexpected nature of network turnover shocks makes it unlikely that there exists certain factors that affect both unexpected forced CEO turnovers among network firms and the focal firm's acquisition strategy.

Nevertheless, in this section we go a step further and formally test the extent to which this dynamic form of reverse causality could affect our inference by examining if network turnover shocks can be explained by firm characteristics, including past acquisition activity, using the following model:

$$Network\ Turnover\ Shock\ (Dummy)_{\ i,t} = \alpha + \beta \times Firm\ Characteristics_{i,t-1} + \epsilon_{i,t}, \quad (8)$$

where i represents firm i and t denotes year t. We present the results of the analyses in Table 13. As shown in the table, we find that none of the firm's own past characteristics predict the occurrence of network turnover shocks. In addition, we find that in no case is the firm's own past acquisition intensity associated with the probability of its CEO experiencing network turnover shocks. To put this simply, the results indicate that, if the CEOs of firm A and B are connected and the CEO of firm B is unexpectedly fired, the characteristics and acquisition activity of firm A do not explain this unexpected turnover.

Network turnover shocks can be considered exogenous with respect to historical firm characteristics and past acquisition activity.

7. Conclusion

A growing literature in recent years documents that CEO overconfidence has significant impact on corporate policies. These findings are based on two important assumptions: CEO overconfidence is a fixed innate characteristic and any results are not due to the matching between time-varying firm and CEO characteristics. In this study, we show that CEO overconfidence can vary significantly over time. Particularly, we show that CEOs hold significantly less vested deep in-the-money options on their own firms' stocks after others in their networks are unexpectedly fired, an exogenous shock to the focal CEOs. This finding is consistent with the notion that CEO overconfidence is deflated after these shocks. Our additional tests further show that this variation in CEO overconfidence is temporal in nature, as predicted by the availability heuristic.

In addition to documenting that CEO overconfidence is time-varying, we investigate how shocks to CEO overconfidence can affect firms' acquisition policy. CEO overconfidence (or hubris) has been identified as an important explanation for firms' acquisition decisions. We provide evidence that CEOs are likely to scale back on acquisitions after observing the unexpected firing of other CEOs in their networks (i.e., experiencing a network turnover shock). We also document that acquisition deals announced by CEOs after experiencing network turnover shocks are more valuable to acquirers, suggesting that shocked CEOs tend to reduce value-destroying deals and proceed with intrinsically better ones. Further analysis suggests that network turnover shocks' constraining effects on CEO acquisitions are more pronounced when her firm faces financial constraints. These findings are consistent with our

argument that, influenced by the availability heuristic, CEOs are reminded about the dire consequence of making bad acquisitions through observing other CEOs in their networks being fired unexpectedly. As a result, CEOs' hubris in acquisitions is deflated by these network turnover shocks. They become less overconfident about the value of acquisition opportunities and reduce their firms' acquisition activity; and when they do make acquisitions, these deals are accompanied by higher announcement stock returns. These findings, based on exogenous shocks to CEO overconfidence, provide novel evidence to support that assumption that the impact of CEO overconfidence on corporate policy is unlikely to be due merely to matching between CEOs and firms.

Our study makes several contributions to the literature. We document that CEO overconfidence, rather than being a fixed innate characteristic of CEOs (as assumed in the current literature), can actually vary over time. We identify an exogenous shock, unexpected firings of other CEOs in a CEO's network, that can curb and cause temporal variation in CEO overconfidence. Next, we show that network turnover shocks have real implications to corporate policy in their acquisition decisions. Our findings suggest that firms are significantly less likely to engage in acquisitions immediately after their CEOs experience network turnover shocks. Finally, our findings imply that, in addition to providing a channel for information diffusion between acquirers and targets, CEO networks can provide a "monitoring" effect. Particularly, we show that CEOs can be monitored by reminders stemming from events of negative consequences among their network peers.

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Figure 1: Percentage of CEOs who Hold Vested Deep In-The-Money Options in the Year *Before* and *After* Experiencing a Network Turnover Shock

This figure summarizes the percentage of CEOs who hold vested deep in-the-money options in the year immediately before and the year immediately after they experience a network turnover shock.

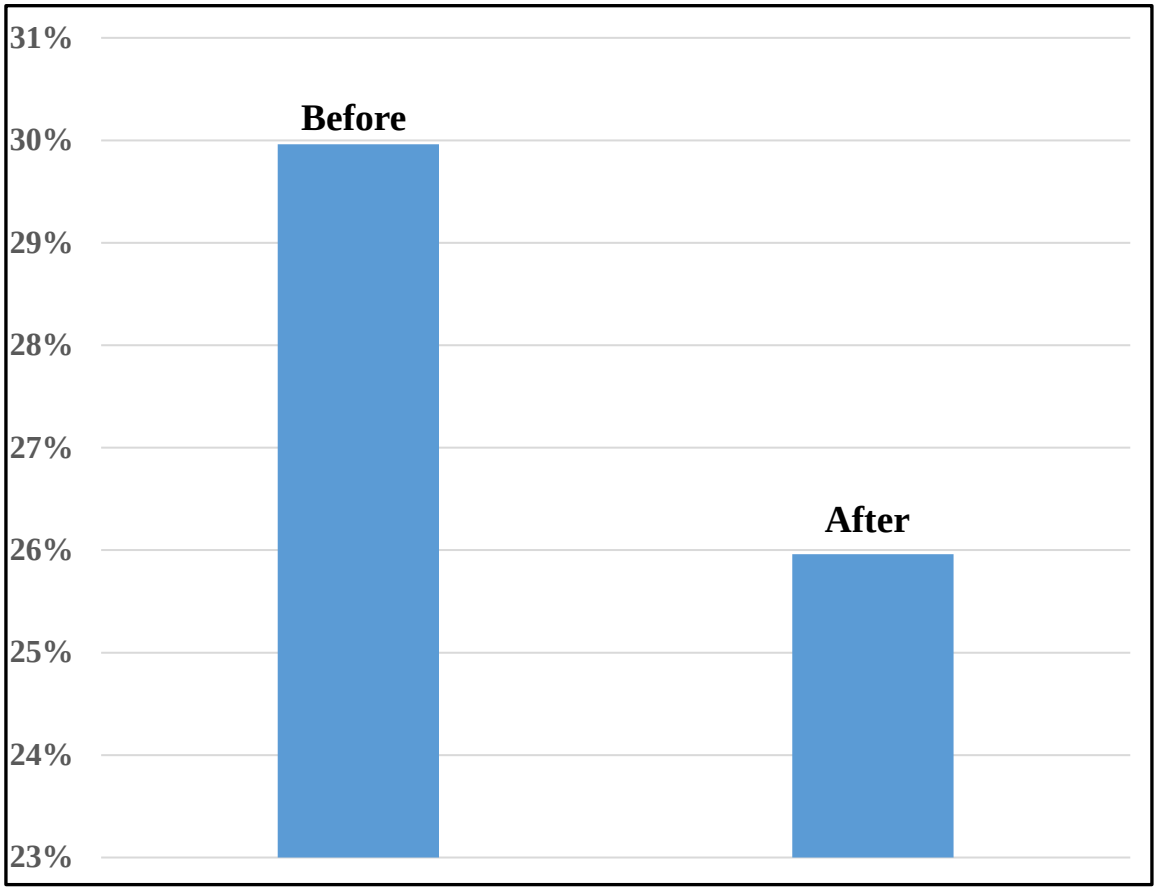

Figure 2: Difference in Likelihood of Holding Vested Deep In-The-Money Options between CEOs who Experience a Network Turnover Shock and Those who Do Not

The vertical axis show the difference in the likelihood of holding vested deep in-the-money options between CEOs who experience a network turnover shock and those who do not, estimated using the model specified in equation (3). The horizontal axis is relative year and Year 0 is the year in which the CEO experiences a network turnover shock. The error bars around the estimates represent the 95% confidence intervals around the point estimates.

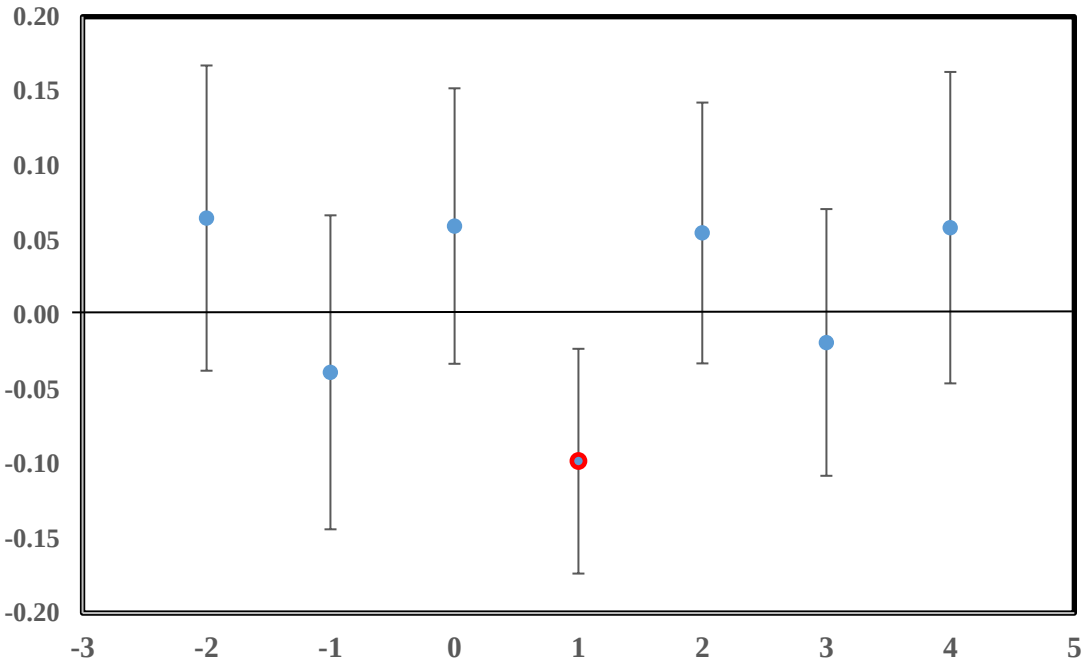

Figure 3: Univariate Difference in Acquisition Activity between the Firms whose CEOs Experience a Network Turnover Shock and Other Firms

This figure summarizes the univariate difference in acquisition activity between firms whose CEOs experience a network turnover shock and other firms. The horizontal axis in each of Figures 1(a) – 1(d) is relative year. Year 0 is the year in which the CEO experiences a network turnover shock and we track the difference in mean acquisition activity for the window [-2, +5]. Measures of acquisition – (a) total deal value (b) acquisition expenses (c) number of acquisitions (d) acquisition dummy – are defined in the Appendix. The point estimates are from a univariate regression in which the dependent variable is acquisition activity in year t, and the dependent variable is *Network Turnover Shock* in year t-k, where k = -2, -1, 0, 1, 2, 3, 4, or 5. The error bars around the estimates represent the 95% confidence intervals around the point estimates.

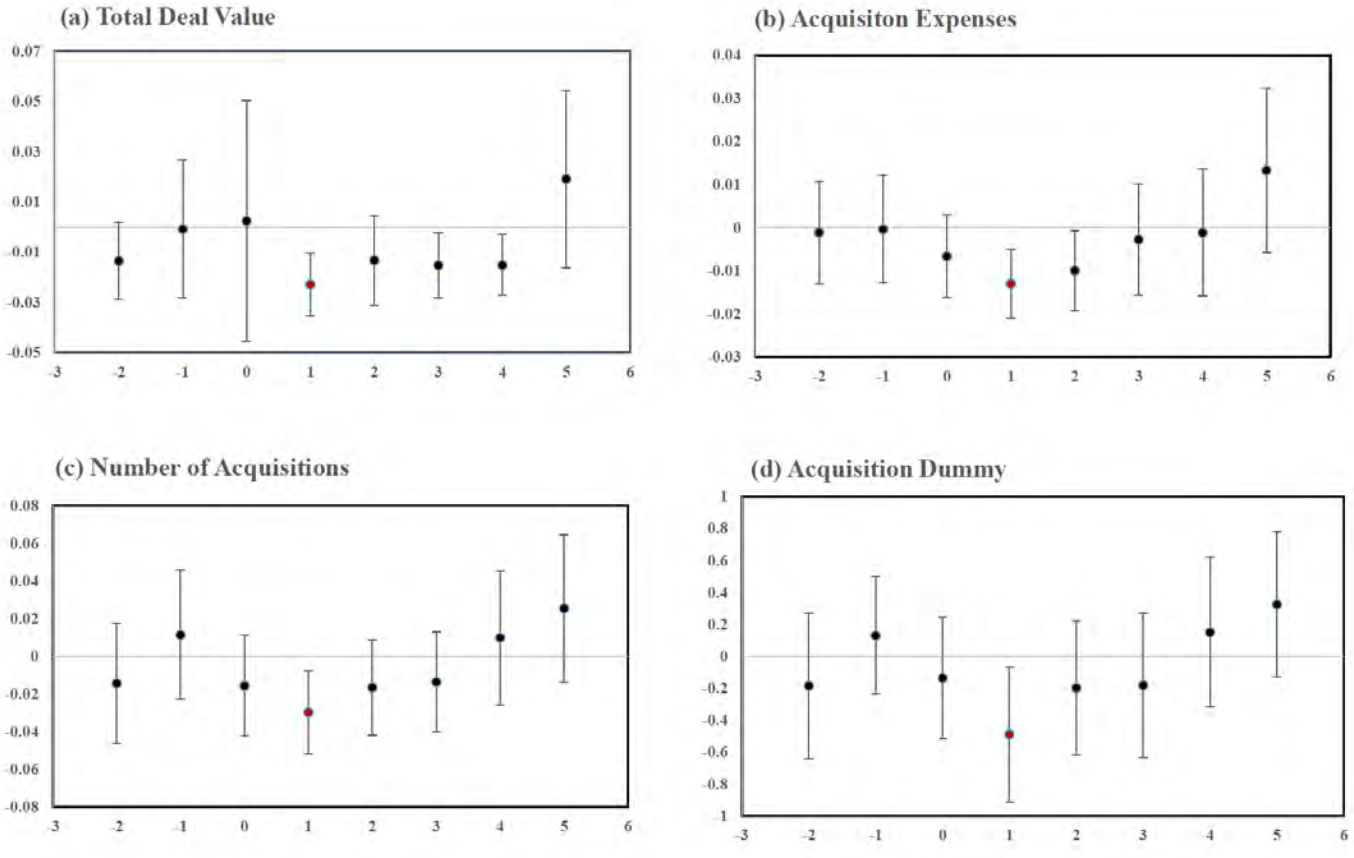

Table 1: Summary Statistics

This table documents the summary statistics for the key variables used in the paper. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles.

VARIABLES	N	Mean	Std	Q1	Q2	Q3
Acquirer	11162	0.170	0.376	0.000	0.000	0.000
Acquisition Expenses	11161	0.039	0.098	0.000	0.001	0.025
Cash	11162	0.165	0.170	0.038	0.104	0.235
Deal Value	11161	0.038	0.185	0.000	0.000	0.000
Holder 67	11162	0.348	0.476	0.000	0.000	1.000
Leverage	11162	0.209	0.208	0.037	0.157	0.308
Liquidity	11162	0.101	0.084	0.059	0.099	0.146
Ln (# Acquisitions)	11162	0.129	0.291	0.000	0.000	0.000
Ln (Total Assets)	11162	7.682	1.571	6.571	7.596	8.713
MB	11162	1.690	1.275	0.887	1.297	2.007
Network Performance Turnover	11162	0.002	0.014	0.000	0.000	0.000
Network Turnover Shock	11162	0.012	0.084	0.000	0.000	0.000
Network Turnover Shock (Dummy)	11162	0.026	0.159	0.000	0.000	0.000
Profit	11162	0.133	0.096	0.086	0.130	0.180
Tangibility	11162	0.242	0.203	0.089	0.177	0.339

Table 2: Do Network Turnover Shocks Deflate Holding of Vested Deep In-the-money Options?

This table presents results from analyzing whether network turnover shocks deflate CEO holding of vested deep in-the-money options. The dependent variable is *Holder67 Annual*, a binary variable with a value of one if the CEO holds options on their own firms' stocks that are at least 67% in-the-money, and zero otherwise. Other variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)
Network Turnover Shock	-0.0981**	-0.0931**	-0.0652*
	(-2.551)	(-2.407)	(-1.689)
Holder67 Annual (Lag)	0.473***	0.465***	0.474***
	(42.01)	(41.73)	(42.82)
Ln (Total Assets)	0.00754***	0.00938***	0.00573**
	(2.645)	(3.149)	(1.988)
Mb	0.0637***	0.0678***	0.0602***
	(11.05)	(10.77)	(9.943)
Profit	0.0883	0.0390	0.0240
	(1.227)	(0.521)	(0.329)
Cash	-0.161***	-0.133***	-0.126***
	(-5.210)	(-3.867)	(-3.737)
Leverage	-0.134***	-0.147***	-0.0977***
	(-6.256)	(-6.574)	(-4.480)
Liquidity	-0.0680	-0.0400	0.0725
	(-0.930)	(-0.544)	(1.002)
Tangibility	-0.0215	-0.0905***	-0.0974***
	(-1.001)	(-2.879)	(-3.193)
Constant	0.0326	0.0331	0.0514*
	(1.304)	(1.209)	(1.929)
Industry Fixed Effects	NO	YES	YES
Year Fixed Effects	NO	NO	YES
Observations	11,164	11,038	11,038
R-squared	0.318	0.324	0.340

Table 3: Network Turnover Shock and Acquisition Withdrawals

This table presents results from analyzing whether network turnover shocks happen after the announcement of an acquisition deal increase the probability of bid withdrawals. The dependent variable in the model is *Withdraw*, a binary variable with a value of one if the deal is withdrawn, and zero otherwise. *Shock* is a binary variable with a value of one if there is at least one network turnover shock between the deal announcement date and the deal withdrawal date (for withdrawn deals) or the deal effective date (for completed deals), and zero otherwise. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)
Shock	1.936***	1.849**
	(2.988)	(2.352)
Holder 67		0.0737
		(0.466)
Ln (Total Assets)		0.0349
		(0.666)
Mb		0.0453
		(0.828)
Profit		-2.106
		(-1.112)
Cash		-0.316
		(-0.548)
Leverage		0.450
		(0.826)
Liquidity		3.544*
		(1.878)
Tangibility		0.853
		(1.627)
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	8,284	7,218
Pseudo R2	0.0613	0.0765

Table 4: Network Turnover Shock and Corporate Acquisition

This table presents results from analyzing the relation between network turnover shocks and corporate acquisitions. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. Panel A documents the analysis where the continuous measure of network turnover shock is used, and Panel B shows the results when the dummy variable is used to measure network turnover shock. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

Panel A

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0315**	-0.0237***	-0.0723**	-0.754**
	(-2.300)	(-2.816)	(-2.543)	(-2.021)
Holder 67	0.00851**	0.00948***	0.0136*	0.115*
	(2.047)	(3.786)	(1.799)	(1.709)
Ln (Total Assets)	-0.00526***	-0.00431***	0.00415	0.0419*
	(-4.079)	(-5.788)	(1.567)	(1.754)
Mb	0.00176	-0.00441***	-0.00617	-0.0753**
	(0.590)	(-3.519)	(-1.640)	(-2.201)
Profit	0.0294	0.0738***	0.0560	0.768
	(0.864)	(4.433)	(1.050)	(1.385)
Cash	0.0365*	0.000951	-0.0519*	-0.454*
	(1.924)	(0.0893)	(-1.673)	(-1.707)
Leverage	0.000928	-0.0186***	-0.0857***	-1.170***
	(0.0922)	(-3.175)	(-4.727)	(-5.215)
Liquidity	0.0570	0.0431**	0.168***	1.472**
	(1.563)	(2.426)	(3.060)	(2.565)
Tangibility	-0.0303**	-0.0520***	-0.120***	-1.338***
	(-1.976)	(-6.242)	(-4.752)	(-4.581)
Constant	0.0649***	0.0785***	0.135***	-2.042***
	(5.094)	(10.43)	(5.420)	(-4.038)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.048	0.057	0.0652

Panel B

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock (Dummy)	-0.0218***	-0.0133***	-0.0398**	-0.406**
	(-3.482)	(-3.039)	(-2.505)	(-2.119)
Holder 67	0.00854**	0.00949***	0.0136*	0.115*
	(2.055)	(3.794)	(1.806)	(1.711)
Ln (Total Assets)	-0.00525***	-0.00431***	0.00416	0.0421*
	(-4.071)	(-5.781)	(1.573)	(1.765)
Mb	0.00179	-0.00440***	-0.00613	-0.0748**
	(0.598)	(-3.501)	(-1.627)	(-2.182)
Profit	0.0291	0.0738***	0.0559	0.763
	(0.855)	(4.431)	(1.046)	(1.376)
Cash	0.0363*	0.000814	-0.0523*	-0.458*
	(1.915)	(0.0765)	(-1.687)	(-1.723)
Leverage	0.00103	-0.0184***	-0.0854***	-1.166***
	(0.102)	(-3.148)	(-4.703)	(-5.192)
Liquidity	0.0572	0.0431**	0.168***	1.475**
	(1.568)	(2.432)	(3.063)	(2.569)
Tangibility	-0.0305**	-0.0521***	-0.120***	-1.341***
	(-1.985)	(-6.255)	(-4.764)	(-4.595)
Constant	0.0650***	0.0785***	0.135***	-1.317***
	(5.103)	(10.43)	(5.421)	(-2.580)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.048	0.057	0.0652

Table 5: Are Deals Announced by Shocked CEOs more Valuable?

This table presents results from studying whether or not acquisition bids announced by CEOs experiencing network turnover shocks have greater announcement cumulative abnormal returns (CARs). The dependent variable is the three-day announcement CAR. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)
Network Turnover Shock	0.0157**	0.0333***
	(2.244)	(3.333)
Holder 67	0.00163	0.00164
	(1.515)	(0.884)
Ln (Total Assets)	-0.00213***	-0.00237***
	(-5.219)	(-3.593)
MB	0.000248	0.000556
	(0.409)	(0.605)
Cash Flow	0.00921	0.00678
	(1.359)	(0.920)
Leverage	0.00698	0.0121*
	(1.376)	(1.706)
Return	0.0136***	0.0190***
	(7.681)	(7.847)
Acquisition Experience	-0.000486	-0.00433*
	(-0.277)	(-1.701)
Board Independence		-0.00164
		(-0.194)
CEO Duality		0.000565
		(0.305)
CEO Tenure		0.00174
		(1.487)
Relative Size		0.00488
		(0.700)
Public Target		-0.00631***
		(-3.271)
Cash Deal		0.00904***
		(4.675)
Same Industry		0.00536***
		(2.750)
Constant	0.0202***	0.0201**
	(4.232)	(1.992)
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	7,414	4,120
R-squared	0.034	0.062

Table 6: Turnover Shocks, Financial Constraints, and Corporate Acquisitions
This table presents results from analyzing the influence of financial constraints on the relation between network turnover shocks and corporate acquisitions. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. *SA Index* is the Hadlock and Pierce (2010) financial constraint index. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0666***	-0.0207	-0.167***	-2.071**
	(-3.199)	(-1.264)	(-3.528)	(-2.370)
Network Turnover Shock x SA Index	-0.0153**	0.00149	-0.0421*	-0.552*
	(-2.564)	(0.311)	(-1.959)	(-1.817)
SA Index	-0.0207***	-0.0154***	-0.00947	-0.105
	(-4.830)	(-6.860)	(-1.370)	(-1.603)
Holder 67	0.00890**	0.0100***	0.0141*	0.121*
	(2.108)	(3.921)	(1.863)	(1.780)
Ln (Total Assets)	-0.0181***	-0.0139***	-0.00167	-0.0215
	(-5.795)	(-8.777)	(-0.338)	(-0.475)
Mb	0.00188	-0.00442***	-0.00661*	-0.0804**
	(0.628)	(-3.509)	(-1.752)	(-2.333)
Profit	0.0246	0.0694***	0.0573	0.771
	(0.717)	(4.085)	(1.068)	(1.375)
Cash	0.0425**	0.00419	-0.0478	-0.403
	(2.194)	(0.387)	(-1.530)	(-1.495)
Leverage	-0.000898	-0.0197***	-0.0881***	-1.203***
	(-0.0883)	(-3.281)	(-4.833)	(-5.285)
Liquidity	0.0616*	0.0489***	0.168***	1.470**
	(1.678)	(2.718)	(3.039)	(2.542)
Tangibility	-0.0289*	-0.0515***	-0.121***	-1.348***
	(-1.842)	(-5.983)	(-4.737)	(-4.532)
Constant	0.113***	0.115***	0.158***	-1.037*
	(6.494)	(12.09)	(5.310)	(-1.899)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	10,946	10,946	10,947	10,939
R-squared/Pseudo R2	0.026	0.055	0.058	0.0668

Table 7: Network Turnover Shock and Network Acquisition Intensity

This table presents results from analyzing the relation between network turnover shocks and corporate acquisition, with additional control for network acquisition intensity. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. *Network Acquisition Intensity* that measures the average acquisition intensity (based on each of the four proxies for acquisition activity) among all the firms to which the CEO is connected. All other variable definitions are as in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0315**	-0.0233***	-0.0727**	-0.756**
	(-2.303)	(-2.761)	(-2.556)	(-2.028)
Network Acquisition Intensity	0.0151	0.0539***	0.0188	0.0839
	(0.703)	(2.941)	(1.576)	(0.984)
Holder 67	0.00853**	0.00940***	0.0137*	0.116*
	(2.051)	(3.773)	(1.812)	(1.720)
Ln (Total Assets)	-0.00527***	-0.00428***	0.00404	0.0418*
	(-4.083)	(-5.777)	(1.526)	(1.747)
Mb	0.00174	-0.00436***	-0.00622*	-0.0756**
	(0.583)	(-3.498)	(-1.657)	(-2.213)
Profit	0.0295	0.0745***	0.0576	0.777
	(0.868)	(4.483)	(1.084)	(1.408)
Cash	0.0364*	0.00139	-0.0518*	-0.453*
	(1.920)	(0.131)	(-1.673)	(-1.704)
Leverage	0.000889	-0.0187***	-0.0854***	-1.168***
	(0.0883)	(-3.206)	(-4.714)	(-5.210)
Liquidity	0.0571	0.0422**	0.168***	1.471**
	(1.565)	(2.381)	(3.066)	(2.564)
Tangibility	-0.0301**	-0.0510***	-0.119***	-1.332***
	(-1.967)	(-6.169)	(-4.720)	(-4.565)
Constant	0.0645***	0.0764***	0.133***	-1.343***
	(5.081)	(10.29)	(5.333)	(-2.627)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.049	0.057	0.0653

Table 8: Network Turnover Shock vs. Network Turnover due to Poor Performance
This table presents results from analyzing the relation between network turnover shocks and corporate acquisition, with an additional control for network turnovers due to poor performance. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. Network Performance Turnover is calculated in a similar manner to Network Turnover Shock except that it is limited CEO turnover that was accompanied by firm performance in the lowest quartile for the industry. All other variable definitions are as in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0315**	-0.0237***	-0.0723**	-0.754**
	(-2.299)	(-2.816)	(-2.544)	(-2.021)
Network Performance Turnover	0.107	0.0374	-0.294*	-3.635*
	(0.500)	(0.517)	(-1.750)	(-1.794)
Holder 67	0.00846**	0.00946***	0.0137*	0.117*
	(2.038)	(3.777)	(1.817)	(1.740)
Ln (Total Assets)	-0.00527***	-0.00431***	0.00416	0.0424*
	(-4.088)	(-5.789)	(1.571)	(1.774)
Mb	0.00176	-0.00441***	-0.00618	-0.0756**
	(0.590)	(-3.517)	(-1.641)	(-2.210)
Profit	0.0294	0.0739***	0.0560	0.760
	(0.865)	(4.434)	(1.049)	(1.371)
Cash	0.0364*	0.000942	-0.0518*	-0.454*
	(1.922)	(0.0885)	(-1.671)	(-1.709)
Leverage	0.000768	-0.0186***	-0.0853***	-1.172***
	(0.0764)	(-3.179)	(-4.702)	(-5.223)
Liquidity	0.0566	0.0429**	0.169***	1.493***
	(1.556)	(2.420)	(3.078)	(2.594)
Tangibility	-0.0303**	-0.0520***	-0.120***	-1.342***
	(-1.973)	(-6.238)	(-4.758)	(-4.593)
Constant	0.0648***	0.0785***	0.135***	-1.306**
	(5.076)	(10.43)	(5.427)	(-2.575)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.048	0.057	0.0655

Table 9: Network Turnover Shock: CEOs vs other Directors

This table presents results from analyzing the relation between network turnover shocks and corporate acquisition, with an additional control for network turnovers through networks of other directors. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. *Network Turnover Shock Directors* measures the frequency of forced CEO turnovers (not related to poor performance) among all the executives in the networks of all the directors of the focal firm except the CEO. All other variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0315**	-0.0236***	-0.0722**	-0.747**
	(-2.310)	(-2.799)	(-2.526)	(-1.992)
Network Turnover Shock Directors	-0.00507	-0.00515	-0.0136	-0.166
	(-0.220)	(-0.365)	(-0.394)	(-0.479)
Holder 67	0.00879**	0.00970***	0.0145*	0.123*
	(2.108)	(3.860)	(1.913)	(1.832)
Ln (Total Assets)	-0.00535***	-0.00437***	0.00394	0.0398*
	(-4.128)	(-5.833)	(1.484)	(1.666)
Mb	0.00190	-0.00431***	-0.00587	-0.0728**
	(0.628)	(-3.411)	(-1.553)	(-2.135)
Profit	0.0295	0.0741***	0.0564	0.774
	(0.860)	(4.421)	(1.051)	(1.395)
Cash	0.0367*	0.00115	-0.0514*	-0.447*
	(1.927)	(0.108)	(-1.656)	(-1.684)
Leverage	0.000673	-0.0187***	-0.0862***	-1.177***
	(0.0666)	(-3.190)	(-4.735)	(-5.241)
Liquidity	0.0574	0.0435**	0.170***	1.487***
	(1.565)	(2.442)	(3.086)	(2.588)
Tangibility	-0.0300*	-0.0519***	-0.119***	-1.316***
	(-1.950)	(-6.213)	(-4.703)	(-4.527)
Constant	0.0654***	0.0788***	0.136***	-1.077**
	(5.117)	(10.42)	(5.450)	(-2.539)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	10,992	10,992	10,993	10,985
R-squared/Pseudo R2	0.022	0.048	0.057	0.0655

Table 10: Excluding Same-Industry Network Turnover Shocks

This table presents results from analyzing the relation between network turnover shocks and corporate acquisition, but redefining *Network Turnover Shocks* by removing such turnover shocks from firms in the same Fama-French 48 industry. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0861***	-0.0639***	-0.154*	-1.621
	(-2.966)	(-3.034)	(-1.861)	(-1.564)
Holder 67	0.00848**	0.00945***	0.0135*	0.114*
	(2.040)	(3.779)	(1.788)	(1.689)
Ln (Total Assets)	-0.00524***	-0.00430***	0.00417	0.0421*
	(-4.066)	(-5.770)	(1.574)	(1.763)
Mb	0.00181	-0.00438***	-0.00610	-0.0744**
	(0.605)	(-3.489)	(-1.618)	(-2.176)
Profit	0.0296	0.0740***	0.0567	0.772
	(0.870)	(4.446)	(1.063)	(1.396)
Cash	0.0360*	0.000631	-0.0527*	-0.461*
	(1.902)	(0.0593)	(-1.701)	(-1.733)
Leverage	0.00127	-0.0183***	-0.0849***	-1.163***
	(0.126)	(-3.128)	(-4.682)	(-5.177)
Liquidity	0.0570	0.0431**	0.168***	1.470**
	(1.562)	(2.427)	(3.058)	(2.562)
Tangibility	-0.0306**	-0.0522***	-0.121***	-1.341***
	(-1.991)	(-6.263)	(-4.770)	(-4.594)
Constant	0.0646***	0.0783***	0.134***	-2.044***
	(5.079)	(10.41)	(5.399)	(-4.042)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.048	0.056	0.0650

Table 11: Excluding Small Deals

This table presents results from analyzing the relation between network turnover shocks and corporate acquisitions after removing small deals. Panel A excludes deals with values that are smaller than 5% of acquiring firms' total assets, Panel B excludes deals with values that are smaller than 10% of acquiring firms' total assets, and Panel C excludes deals with values that are smaller than $10 million. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

Panel A

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0309**	-0.0237***	-0.0627***	-1.140**
	(-2.252)	(-2.816)	(-2.934)	(-2.273)
Holder 67	0.00796*	0.00948***	0.00701	0.0621
	(1.926)	(3.786)	(1.252)	(0.838)
Ln (Total Assets)	-0.00564***	-0.00431***	-0.00812***	-0.105***
	(-4.404)	(-5.788)	(-4.341)	(-4.056)
Mb	0.00177	-0.00441***	-0.00553*	-0.0804**
	(0.592)	(-3.519)	(-1.884)	(-2.154)
Profit	0.0314	0.0738***	0.0764*	1.110*
	(0.925)	(4.433)	(1.860)	(1.895)
Cash	0.0391**	0.000951	0.00565	-0.0518
	(2.077)	(0.0893)	(0.233)	(-0.184)
Leverage	0.00230	-0.0186***	-0.0474***	-1.080***
	(0.230)	(-3.175)	(-3.456)	(-4.386)
Liquidity	0.0533	0.0431**	0.0935**	1.202*
	(1.465)	(2.426)	(2.102)	(1.891)
Tangibility	-0.0278*	-0.0520***	-0.0687***	-1.152***
	(-1.836)	(-6.242)	(-3.604)	(-3.540)
Constant	0.0646***	0.0785***	0.159***	-1.739*
	(5.129)	(10.43)	(8.628)	(-1.924)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.021	0.048	0.036	0.0561

Panel B

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0286**	-0.0237***	-0.0414**	-1.073*
	(-2.102)	(-2.816)	(-2.419)	(-1.869)
Holder 67	0.00798*	0.00948***	0.00776*	0.152*
	(1.957)	(3.786)	(1.792)	(1.812)
Ln (Total Assets)	-0.00562***	-0.00431***	-0.00836***	-0.171***
	(-4.430)	(-5.788)	(-5.988)	(-5.917)
Mb	0.00210	-0.00441***	-0.00339	-0.0743*
	(0.707)	(-3.519)	(-1.415)	(-1.832)
Profit	0.0273	0.0738***	0.0467	0.970
	(0.812)	(4.433)	(1.383)	(1.439)
Cash	0.0414**	0.000951	0.0239	0.230
	(2.218)	(0.0893)	(1.324)	(0.782)
Leverage	0.00502	-0.0186***	-0.0232**	-0.844***
	(0.508)	(-3.175)	(-2.230)	(-3.065)
Liquidity	0.0526	0.0431**	0.0815**	1.485**
	(1.462)	(2.426)	(2.177)	(1.994)
Tangibility	-0.0248*	-0.0520***	-0.0414***	-1.032***
	(-1.651)	(-6.242)	(-2.931)	(-2.902)
Constant	0.0597***	0.0785***	0.119***	-1.185
	(4.797)	(10.43)	(8.591)	(-1.289)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.020	0.048	0.030	0.0568

Panel C

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock	-0.0314**	-0.0237***	-0.0708**	-0.768**
	(-2.290)	(-2.816)	(-2.544)	(-2.021)
Holder 67	0.00842**	0.00948***	0.0129*	0.108
	(2.028)	(3.786)	(1.733)	(1.590)
Ln (Total Assets)	-0.00509***	-0.00431***	0.00731***	0.0713***
	(-3.966)	(-5.788)	(2.829)	(3.009)
Mb	0.00175	-0.00441***	-0.00559	-0.0760**
	(0.585)	(-3.519)	(-1.503)	(-2.169)
Profit	0.0290	0.0738***	0.0511	0.768
	(0.854)	(4.433)	(0.975)	(1.357)
Cash	0.0362*	0.000951	-0.0543*	-0.438
	(1.913)	(0.0893)	(-1.812)	(-1.641)
Leverage	0.00112	-0.0186***	-0.0826***	-1.148***
	(0.111)	(-3.175)	(-4.619)	(-5.075)
Liquidity	0.0577	0.0431**	0.164***	1.459**
	(1.580)	(2.426)	(3.053)	(2.486)
Tangibility	-0.0301**	-0.0520***	-0.116***	-1.334***
	(-1.968)	(-6.242)	(-4.702)	(-4.545)
Constant	0.0633***	0.0785***	0.106***	-1.551***
	(4.995)	(10.43)	(4.422)	(-3.121)
Industry Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
Observations	11,034	11,034	11,035	11,027
R-squared/Pseudo R2	0.022	0.048	0.055	0.0632

Table 12 – Network Turnover Shock and Corporate Acquisition: How Long Does the Impact Last?

This table presents results from analyzing the duration of network turnover shocks' impact on corporate acquisitions. The dependent variable is *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. *Year – x* represents the number of years (x) before year t. Only results on the variables of interest (*Network Turnover Shock*) are reported for the ease of results presentation, but all control variables are included as in Table 3. Each row represents a separate regression following equation (6) and substitute *Network Turnover Shock* as indicated. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Network Turnover Shock (year -2)	-0.0325*	-0.0200**	-0.0518*	-0.439
	(-1.767)	(-2.340)	(-1.725)	(-1.216)
Network Turnover Shock (year -3)	-0.0522***	-0.0212*	-0.104***	-1.125**
	(-6.469)	(-1.777)	(-3.684)	(-2.505)
Network Turnover Shock (year -4)	-0.0318***	-0.00578	0.00384	0.235
	(-2.963)	(-0.438)	(0.0998)	(0.604)
Network Turnover Shock (year -5)	0.0102	0.0167	-0.0512	-0.681
	(0.421)	(0.951)	(-1.218)	(-1.388)
Network Turnover Shock (year -6)	0.0510	-0.00761	0.0510	0.486
	(0.819)	(-0.464)	(0.955)	(1.077)

Table 13 – Are Network Turnover Shocks Predictable?

This table presents results from analyzing whether the occurence of network turnover shocks is predictable by firm characteristics. The dependent variable is *Network Turnover Shock (Dummy)* in year *t*. *Acquisition Intensity* is measured by *Deal Value, Acquisition Expenses*, *Ln (# Acquisitions)*, and *Acquirer* in columns 1, 2, 3 and 4, respectively. All independent variables are measured in year *t-1*. Variable definitions are in the Appendix. All continuous variables are winsorized at the 1st and the 99th percentiles. Standard errors are clustered at the firm level. *, **, and *** indicate the 10%, 5%, and 1% level of significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)
Acquisition Intensity	-0.126	-0.668	-0.0950	-0.0309
	(-0.645)	(-0.801)	(-0.484)	(-0.201)
Ln (Vega)	0.0410	0.0408	0.0409	0.0411
	(0.846)	(0.842)	(0.844)	(0.846)
Ln (Delta)	-0.00503	-0.00338	-0.00465	-0.00564
	(-0.0851)	(-0.0574)	(-0.0790)	(-0.0957)
CEO Duality	0.0574	0.0557	0.0558	0.0572
	(0.411)	(0.398)	(0.399)	(0.409)
Board Independence	0.888	0.891	0.890	0.890
	(1.298)	(1.305)	(1.301)	(1.301)
Return	-0.264	-0.258	-0.265	-0.266
	(-1.628)	(-1.586)	(-1.634)	(-1.640)
Ln (Total Assets)	0.0774	0.0735	0.0783	0.0782
	(1.476)	(1.393)	(1.495)	(1.490)
MB	0.0102	0.00850	0.00810	0.00791
	(0.143)	(0.119)	(0.113)	(0.110)
Profit	0.510	0.499	0.522	0.534
	(0.428)	(0.421)	(0.441)	(0.450)
Cash	0.453	0.381	0.443	0.458
	(0.941)	(0.775)	(0.908)	(0.939)
Leverage	-0.0814	-0.0525	-0.0909	-0.0894
	(-0.190)	(-0.122)	(-0.212)	(-0.209)
Liquidity	0.241	0.276	0.247	0.242
	(0.204)	(0.234)	(0.209)	(0.205)
Tangibility	-0.495	-0.542	-0.500	-0.490
	(-1.037)	(-1.124)	(-1.050)	(-1.029)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	10,342	10,342	10,342	10,342
Pseudo R2	0.0557	0.0560	0.0557	0.0557

Appendix – Variable Definitions

VARIABLE	Definition
Acquirer	A dummy variable with a value of one for firms that make at least one acquisition in a year, and a value of zero otherwise.
Acquisition Expenses	The division between the acquisition expenses a firm reports on its 10-K filings and its total assets.
Acquisition Experience	The natural logarithm of the sum of one and the number of acquisitions a firm makes in the last two years.
Board Independence	The percentage of independent directors on the board.
Cash	Cash and cash equivalents divided by total assets.
Cash Deal	A dummy variable with a value of one if the payment of an acquisition is cash, and a value of zero otherwise.
Cash Flow	The sum of income before extraordinary items and depreciation and amortization divided by total assets.
CEO Duality	A dummy variable with a value of one if the CEO is also the chair of the board, and a value of zero otherwise.
CEO Tenure	The natural logarithm of the sum of one and the number of years a CEO has been in the role.
Deal Value	The total dollar value of acquisition bids announced in a year by the firm's total assets in the same year.
Holder 67	A binary variable with a value of one if a CEO is overconfident, and with a value of zero otherwise. Holder 67 is defined following the method in Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011).
Leverage	Book value of debt divided by the sum of market value of equity and book value of debt.
Liquidity	Operating cash flows divided by total assets.
Ln (# Acquisitions)	The natural logarithm of the sum of one and the number of acquisitions a firm makes in a year.
Ln (Total Assets)	The natural logarithm of the sum of one and total assets.
MB	The sum of market of value equity and book value of debt divided by total assets.
Network Performance Turnover	A measure of the extent to which CEO turnovers due to poor performance happen among CEOs in the focal CEO's network. See section 3 for details.
Network Turnover Shock	A measure of the extent to which unexpected CEO turnovers happen among CEOs in the focal CEO's network. See section 3 for details.
Network Turnover Shock (Dummy)	A dummy variable with a value of one if there is at least one unexpected CEO turnover among CEOs in the focal CEO's network, and a value of zero otherwise.
Profit	Operating income before depreciation divided by total assets.
Public Target	A dummy variable with a value of one if the target is a publicly traded company and a value of zero otherwise.
Relative Size	Deal value divided by the acquirer's market capitalization at the beginning of the fiscal year.
Return	Fiscal year stock return.
Same Industry	A dummy variable with a value of one if the acquirer and the target are in the same Fame-French 48 industry, and a value of zero otherwise.
Tangibility	Total property, plant, and equipment divided by total assets.