Internet Appendix to "Does Policy Uncertainty Affect Mergers and Acquisitions?"

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This appendix contains additional tests omitted from the main text for brevity.

1. Alternative specifications and endogeneity concerns

We verify the robustness of our baseline Table 3 result that policy uncertainty is significantly negatively related to acquisition likelihood. First, we show that the negative relation holds when including macroeconomic controls individually. Tables IA1, IA2, and IA3 present controls for investment opportunities, valuation waves, and general economic uncertainty, respectively. The policy uncertainty coefficient remains negative and significant in all models. Moreover, many macroeconomic controls become insignificant in regressions with policy uncertainty. For example, three of the four valuation wave proxies and half of the other uncertainty proxies have significant explanatory power on their own but not in models including policy uncertainty.

Next, to address the possibility that an omitted variable bias remains present in our tests, we propose several plausibly exogenous instruments for policy uncertainty in Table IA4. First, we use the Azzimonti (2016) partisan-conflict index from the Federal Reserve Bank of Philadelphia, which is based on a frequency count of newspaper articles containing terms related to lawmakers' policy disagreement. Second, similar in spirit to Julio and Yook (2016) we use two variables that measure the political uncertainty generated by gubernatorial elections based on data from the Congressional Quarterly Press Electronic Library. In the first stage, we regress the Baker, Bloom, and Davis (2016) index on each instrument, the macroeconomic controls used in our main specification from Table 3, as well as annual averages of the firm-level controls used in our previous tests. In the second stage, we run the same logistic regressions from Table 3, only this time using the fitted values from the first stage regressions as the policy uncertainty variable. F-statistics from the first stage regressions suggest that all our instruments satisfy the relevance condition. Across all specifications, we find that the negative relation between policy uncertainty and acquisition likelihood remains significantly negative. This result, combined with our extensive set of controls, helps alleviate endogeneity concerns.

2. Deregulation

We examine how deregulation events and idiosyncratic volatility relate to M&A activity. We identify deregulation events as the union of deregulation events from Harford (2005) and Ovtchinnikov (2013) that occur during our sample period. We examine acquisition likelihood in year $t+1$ as a function of policy uncertainty, deregulation, and macro- and firm-level controls in year t. Since Irvine and Pontiff (2009) show that deregulation is generally followed by an increase in idiosyncratic volatility (which could impact mergers), we explicitly control for the change in idiosyncratic volatility around the deregulation event (from year t to $t+1$). We also control for total volatility in year t (as in all models in the paper) to account for firm-level risk during deregulation.

Table IA5 shows that, indeed, deregulation events are followed by upticks in merger activity on average. This result holds with (Model (1)) or without (Model (3)) controls for policy uncertainty. Model (2) and (4) are analogous except we condition on whether or not idiosyncratic volatility actually decreased after the regulation (from year t to $t+1$). Our estimates show that the effect of deregulation on mergers is significantly greater in cases where idiosyncratic volatility decreased post-deregulation.

In Table IA6 we examine the effect of changes in regulatory uncertainty in general (as opposed to restricting ourselves to deregulation events). We use the BBD regulation and financial regulation indices to identify spikes in uncertainty related to regulation. To identify significant spikes in regulatory uncertainty, we construct an indicator variable (Regulatory policy uncertainty spike) which equals one if, within the calendar year, the BBD regulation (Models (1)-(4)) or financial regulation (Models (5)-(8)) jumps to at least two standard deviations above the mean and falls back below the mean (i.e., policy uncertainty was resolved). Whether or not we control for policy uncertainty, we see that regulatory uncertainty spikes differentially affect firms with decreases in idiosyncratic volatility, with mergers becoming more likely if idiosyncratic volatility falls after the regulatory spike. The results suggest that a decline in idiosyncratic volatility is associated with a subsequent increase in M&A activity.

Finally, it is important to note that the effect of the overall BBD policy uncertainty index on acquisition likelihood remains consistently negative and significant, even after controlling for various regulatory events.

Overall, the results in Tables IA5 and IA6 confirm that decreases in regulatory uncertainty

are followed by increases in merger activity and that this relation is moderated by the effects of deregulation on idiosyncratic risk. It is important to note that Irvine and Pontiff (2009) find that deregulation increases idisyncratic volatility on average, which should decrease merger activity. This seems to be inconsistent with the prior findings that deregulation events are followed by increased merger activity (e.g., Mitchell and Mulherin, 1996). Our results offer a potential resolution for these opposing findings: While deregulation could increase idiosyncratic volatility on average, it could in fact decrease firm-level risk for some firms (e.g., some incumbents could be expected to benefit from deregulation). If this is the case, we should see a positive relation between deregulation and future merger activity only for the firms that experience reduced idiosyncratic volatility post-deregulation, which is what we find in Table IA6.

3. Competition and types of policy uncertainty

In Table IA7 we rerun the acquisition likelihood model in Table 7, replacing the overall BBD index with its four components (news, tax, government spending and CPI) in Panel A and with the subcomponents of the news in Panel B. The interactive effect of competition with policy uncertainty is strongest for the government spending and news components, and for news subcomponents capturing taxes, government spending, monetary and fiscal policy, regulation (overall and financial), health care and entitlement.

4. Likelihood of acquiring a private target

In Table IA8 we rerun the acquisition likelihood model in Table 3 for private-target acquisitions only. The overall BBD index and each of the four subcomponents (news, tax, government spending and CPI) have a significant negative effect on the likelihood of acquiring a private target.

5. Method of payment

Prior policy uncertainty literature (e.g., Julio and Yook, 2012) finds that firms tend to increase cash holdings when policy uncertainty increases. Thus, in Table IA9 we examine the relation between policy uncertainty and merger payment method (cash or stock). The results suggest that higher policy uncertainty is associated with an increased likelihood of stock financing for firms that are least likely to be overvalued, consistent with the idea that firms hoard cash during uncertain times (as in Julio and Yook (2012)) but are less able to do so if they are overvalued.

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Table IA1
Controlling for Investment Opportunities and Economic Conditions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Policy uncertainty	-0.690***	-0.656***	-0.615***	-0.690***	-0.690***	-1.125***						
	(-3.88)	(-4.03)	(-3.17)	(-4.03)	(-3.92)	(-5.09)						
Consumer confidence	0.574*						0.576					
	(1.86)						(1.60)					
Leading econ. Indicator		2.072***						2.314***				
		(2.85)						(3.48)				
CFNAI			0.083*						0.143***			
			(1.93)						(3.88)			
Expected GDP growth				-8.230*						-8.727		
				(-1.72)						(-1.18)		
Industry economic shock					0.029						0.036	
					(1.12)						(1.55)	
Rate spread						0.101***						-0.021
						(2.84)						(-0.61)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796

This table presents results from logistic regressions of acquisition likelihood on the Baker, Bloom, and Davis (2016) policy uncertainty index, including controls for investment opportunities, described in Appendix A. Macroeconomic variables are averaged over the prior calendar year; all other variables are measured at the end of the prior fiscal year. In all models we include all firm-level control variables from Table 3 and Fama-French 48 industry fixed effects; we cluster standard errors by firm and year. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA2
Controlling for Valuation Waves

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy Uncertainty	-0.519**	-0.595***	-0.600***	-0.657***				
	(-2.46)	(-3.13)	(-3.64)	(-3.76)				
Shiller's CAPE ratio	0.010				0.020***			
	(1.26)				(2.79)			
Industry median Q		0.223				0.488***		
		(1.64)				(3.20)		
Industry median past returns			0.255***				0.331***	
			(3.52)				(5.08)	
Industry sigma past returns				0.031				0.058*
				(1.02)				(1.90)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796

This table presents results from logistic regressions of acquisition likelihood on the Baker, Bloom, and Davis (2016) policy uncertainty index, including controls for valuation waves, described in Appendix A. Macroeconomic variables are averaged over the prior calendar year; all other variables are measured at the end of the prior fiscal year. In all models we include all firm-level control variables from Table 3 and Fama-French 48 industry fixed effects; we cluster standard errors by firm and year. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA3
Controlling for General Economic Uncertainty

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy uncertainty	-0.678***	-0.647***	-0.695***	-0.660***				
	(-5.02)	(-3.39)	(-3.88)	(-3.50)				
Macroeconomic uncertainty index	-2.805***				-2.833***			
	(-2.62)				(-2.78)			
VXO index		-0.005				-0.008**		
		(-1.26)				(-2.21)		
CS sigma past returns			0.873				0.935	
			(0.59)				(0.56)	
CS sigma past sales growth				-0.440				-2.134**
				(-0.47)				(-1.97)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	115,796	115,796	115,796	115,796	115,796	115,796	115,796	115,796

This table presents results from logistic regressions of acquisition likelihood on the Baker, Bloom, and Davis (2016) policy uncertainty index, including controls for general economic uncertainty, described in Appendix A. Macroeconomic variables are averaged over the prior calendar year; all other variables are measured at the end of the prior fiscal year. In all models we include all firm-level control variables from Table 3 and Fama-French 48 industry fixed effects; we cluster standard errors by firm and year. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA4
Instrumental Variables Analysis

Instrumental variable:	Partisan conflict	Elections no incumbent	Elections 5% margin	All instruments
Policy uncertainty	-0.789***	-0.929***	-0.941***	-0.803***
	(-3.07)	(-3.49)	(-3.74)	(-3.23)
Macro controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
N	115,796	115,796	115,796	115,796
F-statistic from first stage regression	41.63	10.93	15.35	22.96

This table presents results from logistic regressions of acquisition likelihood similar to our main tests from Table 3 with the distinction that, here, the Baker, Bloom, and Davis (2016) policy uncertainty index is instrumented using either the partisan conflict index of Azzimonti (2016) (column 1), or the proportion of assets owned by firms headquartered in states with gubernatorial elections where (i) the incumbent does not run for re-election (column 2) or (ii) the election is won by a margin of 5% or less. In the last column, we use all three instruments simultaneously. The last row shows the F-statistic from the first stage regression corresponding to each specification. In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA5
Acquisition Likelihood and Deregulation

	(1)	(2)	(3)	(4)
Policy uncertainty	-0.677***	-0.674***		
	(-4.00)	(-3.91)		
Deregulation	0.304***	0.192	0.333***	0.230**
	(2.91)	(1.64)	(3.59)	(2.10)
Future idiosyncratic volatility decrease		0.105***		0.107***
		(3.11)		(3.15)
Deregulation x Future idiosyncratic volatility decrease		0.160**		0.147*
		(2.30)		(1.93)
Δ Idiosyncratic volatility	-5.726***	-5.767***	-5.667***	-5.722***
	(-4.27)	(-4.30)	(-3.63)	(-3.67)
Total volatility	-2.366*	-3.020**	-2.793**	-3.457**
	(-1.79)	(-2.22)	(-1.98)	(-2.41)
Macro & firm controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
N	109,494	109,151	109,494	109,151

This table presents results from logistic regressions modeling the likelihood of announcing a merger in year $t+1$ as a function of firm and industry characteristics measured at time t. To our baseline specification from Table 3 we add a deregulation indicator variable ("Deregulation" equals one if the firm is in an industry which experienced a deregulation event at time t), an indicator variable which equals one if the firm's idiosyncratic risk decreases from year t to $t+1$ ("Future idiosyncratic volatility decrease") as well as an interaction between the two. We also control for the firm's change in idiosyncratic risk from $t-1$ to t ("Δ Idiosyncratic volatility"). In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA6
Acquisition Likelihood and Regulatory Uncertainty Spikes

	All Regulation				Financial regulation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Policy uncertainty	-0.672***		-0.663***		-0.678***		-0.658***	
	(-3.71)		(-3.59)		(-3.84)		(-3.79)	
Regulatory policy uncertainty spike	-0.032	-0.113	-0.142	-0.231*	-0.035	-0.097	-0.275***	-0.362***
	(-0.35)	(-1.02)	(-1.39)	(-1.95)	(-0.30)	(-0.59)	(-3.83)	(-3.55)
Future idiosyncratic volatility decrease			0.088**	0.087**			0.085**	0.084**
			(2.50)	(2.52)			(2.53)	(2.46)
Regulatory PU spike x Future idiosyncratic volatility decrease			0.178***	0.194***			0.319***	0.357**
			(4.69)	(4.99)			(2.88)	(2.51)
Δ Idiosyncratic volatility	-5.742***	-5.663***	-5.763***	-5.691***	-5.827***	-5.903***	-5.884***	-5.967***
	(-4.26)	(-3.63)	(-4.27)	(-3.65)	(-4.34)	(-3.80)	(-4.49)	(-3.95)
Total volatility	-2.276*	-2.705*	-2.935**	-3.370**	-2.261*	-2.672*	-2.957**	-3.374**
	(-1.71)	(-1.92)	(-2.15)	(-2.34)	(-1.71)	(-1.89)	(-2.17)	(-2.34)
Macro & firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	109,494	109,151	109,494	109,151	109,494	109,151	109,494	109,151

This table presents results from logistic regressions modeling the likelihood of announcing a merger in year $t+1$ as a function of firm and industry characteristics measured at time t. These tests are identical to the ones from Table IA5, the only difference being that here we replace the deregulation indicator variable with a regulatory-uncertainty indicator variable ("Regulatory policy uncertainty spike"). This variable equals one if the Baker, Bloom, and Davis (2016) regulation-specific policy uncertainty index (columns 1-4) or their financial-regulation-specific policy uncertainty index (columns 5-8) experience a "spike" in year t. A spike is defined as the index increasing to more than two standard deviation above its mean and decreasing to below its mean, within year t. In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA7
Competition and Types of Policy Uncertainty

Panel A: BBD index components				
	News component	Tax component	Gov. spending component	CPI component
Policy uncertainty	-0.004	-0.062**	0.085	-0.204
	(-0.04)	(-2.54)	(1.08)	(-1.09)
Policy uncertainty x TNIC Herfindahl	-0.464***	-0.011	-0.303*	0.219
	(-2.96)	(-0.34)	(-1.68)	(0.66)
TNIC Herfindahl	1.948***	-0.143	1.095	-1.179
	(2.66)	(-0.86)	(1.41)	(-0.79)
Macro & firm controls	Yes	Yes	Yes	Yes
N	73,472	73,472	73,472	73,472

Panel B: Subcomponents of news component

	Fiscal policy	Taxes	Gov. spending	Monetary policy	Regulation	Financial regulation	Health care	Entitlement programs	National security	Trade policy	Sovereign debt
Policy uncertainty	-0.015	-0.047	0.039	-0.001	-0.015	-0.087	-0.009	0.075	-0.009	-0.095	0.003
	(-0.23)	(-0.73)	(0.93)	(-0.02)	(-0.25)	(-1.46)	(-0.15)	(1.14)	(-0.17)	(-1.32)	(0.19)
Policy uncertainty x TNIC	-0.259***	-0.251***	-0.196***	-0.396**	-0.295***	-0.130*	-0.224***	-0.323***	-0.208	0.076	-0.031
	(-2.94)	(-2.75)	(-3.23)	(-2.54)	(-2.59)	(-1.75)	(-3.10)	(-3.22)	(-1.26)	(0.48)	(-0.90)
TNIC	0.949**	0.926**	0.633**	1.558**	1.121**	0.342	0.839**	1.312***	0.705	-0.506	-0.070
	(2.38)	(2.23)	(2.27)	(2.27)	(2.17)	(1.10)	(2.48)	(2.62)	(1.00)	(-0.79)	(-0.53)
Macro & firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	73,472	73,472	73,472	73,472	73,472	73,472	73,472	73,472	73,472	73,472	73,472

This table presents results from logistic regressions of acquisition likelihood on the policy uncertainty, interacted with Herfindahl industry concentration ratios calculated using the Hoberg and Phillips (2016) text-based network industry classifications (TNIC). Policy uncertainty proxies in Panel A are the overall BBD policy uncertainty index and its four components. In Panel B we measure policy uncertainty using the subcomponents of the index's news component. A list of the search terms used to create these subcomponents can be found at: http://www.policyuncertainty.com/categorical_terms.html. All specifications include simultaneous firm-level controls and macroeconomic controls for as in Table 3. Detailed variable definitions are in Appendix A. In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA8
Policy Uncertainty and Private Target Acquisition Likelihood

	News component	Tax component	Gov. spending component	CPI component
Policy uncertainty	-0.749***	-0.110*	-0.349**	-0.811***
	(-3.05)	(-1.93)	(-2.36)	(-3.60)
Investment opportunities (First principal component)	-0.030**	-0.004	-0.008	-0.010
	(-2.53)	(-0.29)	(-0.50)	(-0.84)
Industry economic shock	0.059***	0.029	0.045**	0.043**
	(3.03)	(1.27)	(2.07)	(2.03)
Rate spread	0.174***	0.085***	0.112***	0.066**
	(4.28)	(2.71)	(3.31)	(2.42)
Shiller's CAPE ratio	0.028***	0.016	0.015*	0.010
	(4.21)	(1.57)	(1.86)	(1.26)
Industry median Q	0.138	0.276**	0.246**	0.219*
	(1.35)	(2.20)	(2.07)	(1.81)
Industry median past returns	0.236***	0.260***	0.229***	0.278***
	(3.31)	(3.56)	(2.87)	(3.43)
Industry sigma past returns	-0.048***	-0.040*	-0.039*	-0.035
	(-2.66)	(-1.85)	(-1.91)	(-1.60)
Macroeconomic uncertainty (First principal component)	-0.051***	-0.032	-0.037*	-0.023
	(-3.88)	(-1.56)	(-1.82)	(-1.13)
Log total assets	0.108***	0.106***	0.108***	0.108***
	(7.23)	(7.20)	(7.29)	(7.29)
ROA	0.908***	0.895***	0.912***	0.917***
	(9.01)	(9.31)	(9.36)	(9.52)
Sales growth	0.337***	0.337***	0.337***	0.341***
	(13.00)	(12.74)	(12.77)	(13.07)
Book leverage	-0.541***	-0.553***	-0.555***	-0.558***
	(-5.19)	(-5.13)	(-5.18)	(-5.18)
Cash to total assets	0.442***	0.449***	0.427***	0.438***
	(4.90)	(5.17)	(4.77)	(4.96)
Market-to-book	0.019***	0.018***	0.019***	0.019***
	(4.37)	(4.24)	(4.43)	(4.36)
Past returns	0.109***	0.108***	0.109***	0.105***
	(6.64)	(6.87)	(7.04)	(6.62)
Firm-level volatility	-2.476**	-2.686**	-2.304*	-2.293**
	(-2.00)	(-2.18)	(-1.91)	(-1.97)
Time trend	0.018***	0.036**	0.008	0.013**
	(4.03)	(2.33)	(1.31)	(2.11)
N	115,796	115,796	115,796	115,796

This table presents results from logistic regressions modeling the likelihood of announcing an acquisition of a private target in year $t+1$ as a function of firm and industry characteristics measured at time t. Each column corresponds to a different subcomponent of the Baker, Bloom, and Davis (2016) policy uncertainty index. All other control variables are identical to our baseline specification from Table 3. In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table IA9
Policy Uncertainty and the Method of Payment

	Stock deal: 100% stock			Stock deal: >50% stock		
Policy uncertainty	0.160	0.571**	0.594**	0.241	0.499***	0.386**
	(0.66)	(2.26)	(2.52)	(1.33)	(3.60)	(2.30)
Policy uncertainty x M/B		-0.084**			-0.049*	
		(-2.18)			(-1.69)	
M/B		0.402**			0.215	
		(2.15)			(1.44)	
Policy uncertainty x Past returns			-0.088***			-0.032
			(-2.72)			(-0.96)
Past returns			0.400***			0.133
			(2.61)			(0.79)
Macro & firm controls	Yes	Yes	Yes	Yes	Yes	Yes
N	115,796	115,796	115,796	115,796	115,796	115,796

This table presents results from the second stage of two-stage Heckman probit models which investigate the effect of policy uncertainty on the likelihood of acquiring a target using stock financing. The dependent variable in the second stage equals one if the financing for the deal is 100% stock (columns 1-3) or at least 50% stock (columns 4-6). As proxies for acquirer overvaluation, we use the firm's market-to-book equity ratio (columns 2 and 4) and its cumulative returns in the past 12 months (columns 3 and 6). Both of these proxies are converted to decile ranks (values 0 through 9) and are interacted with the Baker, Bloom, and Davis (2016) policy uncertainty index. All controls from our baseline specification are present in the second stage probit, but are omitted from the table for simplicity. The first stage (not shown) predicts the likelihood of announcing an acquisition, as in first model in Table 3 with the addition of a proxy for hypothetical mechanical mutual funds outflows to the firm, calculated following Edmans, Goldstein, and Jiang (2012). In all models we include Fama-French 48 industry fixed effects and cluster standard errors by firm and year. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.