

Director Job Security and Corporate Innovation

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Abstract

In this paper, we show that firms can become conservative in innovation when their directors face job insecurity. We find that after the staggered enactment of majority voting legislation that strengthens shareholders' power in director elections, firms produce fewer patents, particularly exploratory patents, and fewer forward citations. This effect is stronger for directors facing higher dismissal costs or threats and for firms with greater needs for board expertise and is mitigated by institutional investors' expertise in innovation. Overall, our results suggest that heightened job insecurity induces director myopia, which leads to a reduction in investment in risky, long-term innovation projects.

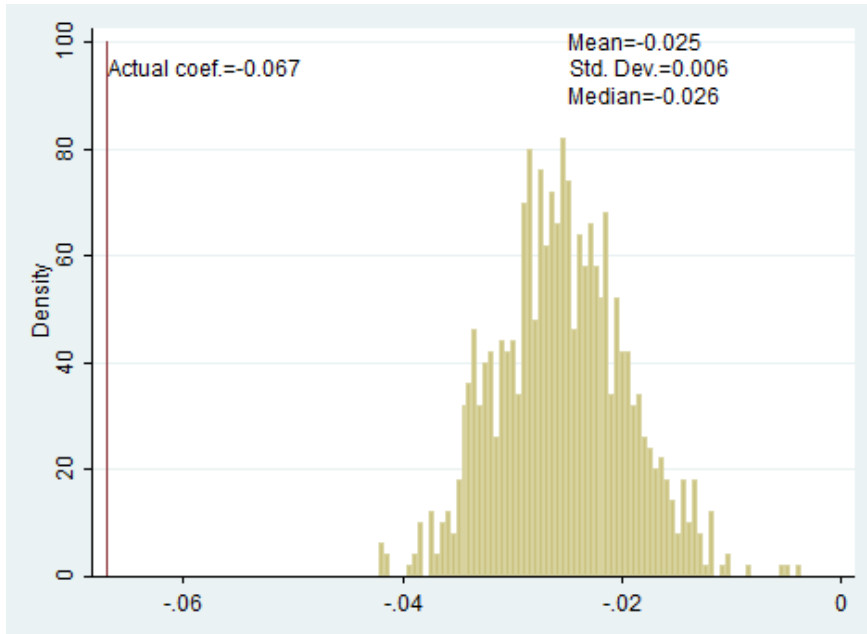
Internet Appendix for

“Director Job Security and Corporate Innovation”

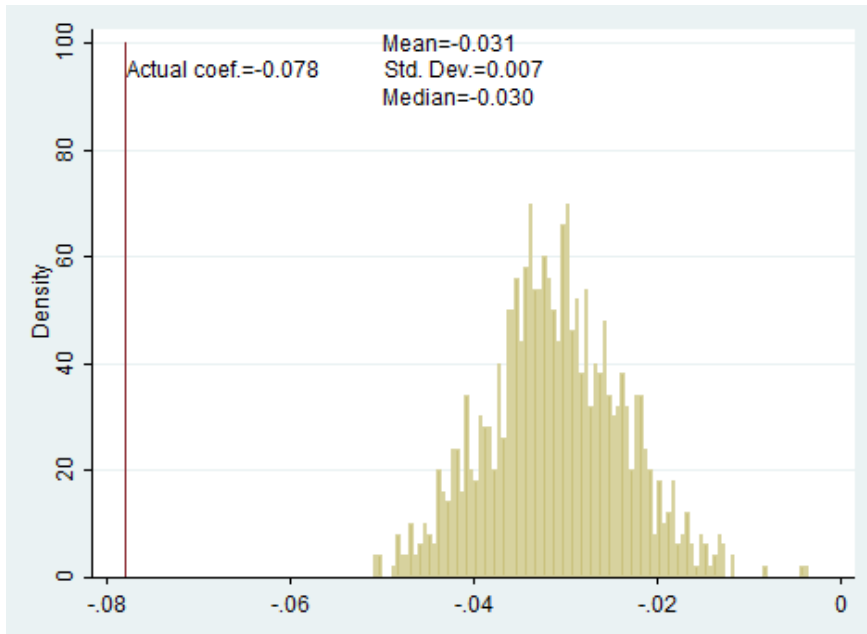
Figure IA1: Placebo Tests

This figure plots the histograms of the coefficient estimates on the indicator variable MV from 1,000 bootstrap simulations of the baseline model in columns 1-4 of Table 4. For each legislating state, we assign a pseudo passage year randomly chosen from the sample period 2003-2018. We then estimate the baseline regression based on those pseudo-event years and save the coefficient estimates on the indicator variable MV.

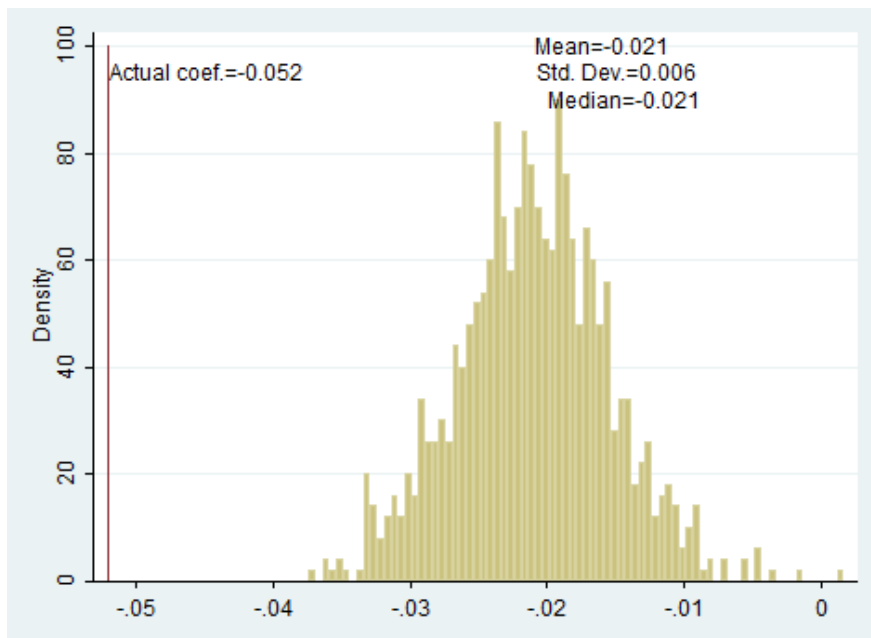
Panel A: Patents



Panel B: Forward citations



Panel C: Exploratory patents



Panel D: Exploitative patents

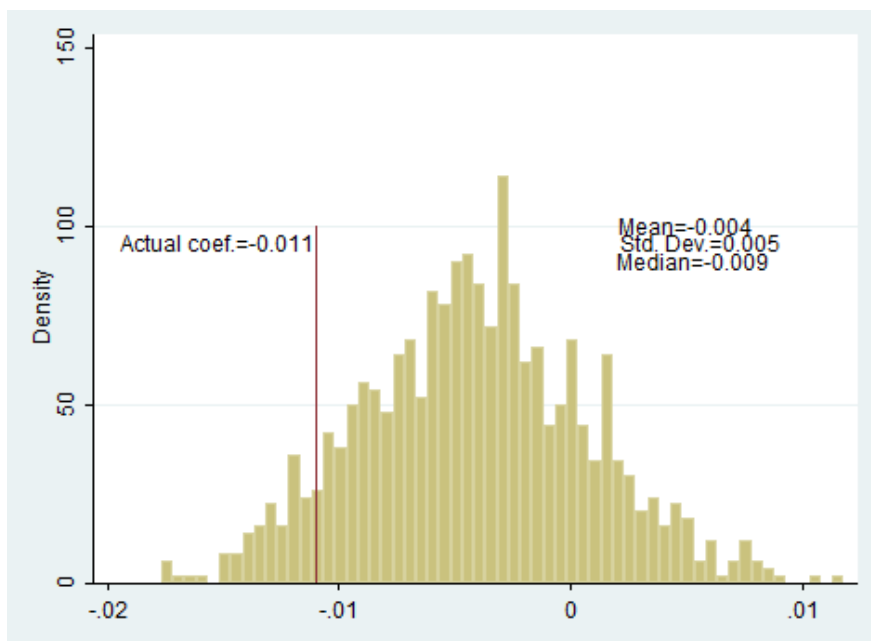


Table IA1. Validation of the Difference-in-differences Method: Pre-trend Analyses

In this table, we report the results on the pre-trend analyses to validate the difference-in-differences method. The dependent variables are PATENTS, FORWARD_CITATIONS, EXPLORATORY_PATENTS and EXPLOITATIVE_PATENTS, respectively, in columns 1 through 4. PATENTS is the natural logarithm of one plus the number of patents. FORWARD_CITATIONS is the natural logarithm of one plus the number of adjusted citations of a firm's patents. EXPLORATORY_PATENTS is the natural logarithm of one plus the number of exploratory patents. EXPLOITATIVE_PATENTS is the natural logarithm of one plus the number of exploitative patents. MV_2, MV_1, MV0, MV1, and MV2 are all dummy variables that equal one if a firm is in the treated state and in years $t-2$, $t-1$, t , $t+1$, and $t+2$, respectively, with year t denoting the MV legislation adoption year, and zero otherwise. MV3 is a dummy variable that equals one if a firm is in the treated state and in years $t+3$ or later and zero otherwise. In all columns, we control for other variables as included in Table 4. Variable definitions are provided in Appendix A. Robust standard errors clustered at the state of incorporation level are reported in parentheses. The superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	PATENTS	FORWARD_CITATIONS	EXPLORATORY_PATENTS	EXPLOITATIVE_PATENTS
MV_2	-0.004 (0.011)	0.002 (0.016)	0.010 (0.010)	-0.007 (0.013)
MV_1	-0.006 (0.011)	-0.007 (0.018)	-0.009 (0.011)	-0.002 (0.014)
MV0	-0.006 (0.012)	-0.008 (0.016)	-0.007 (0.010)	0.002 (0.012)
MV1	-0.042*** (0.012)	-0.052*** (0.017)	-0.032*** (0.012)	-0.001 (0.019)
MV2	-0.061*** (0.013)	-0.049*** (0.017)	-0.041*** (0.015)	-0.013 (0.019)
MV3	-0.082*** (0.018)	-0.098*** (0.022)	-0.063*** (0.019)	-0.016 (0.020)
Other controls	Y	Y	Y	Y
HQ region \times Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
N	51,120	51,120	51,120	51,120
Adjusted R ²	0.875	0.822	0.815	0.844

Table IA2. The Timing of Adopting MV Legislation

In this table, we report the estimates from a Weibull hazard model in which the “failure event” is the adoption of MV legislation in a state. States are dropped from the sample once they adopt the legislation. All explanatory variables are at the state level and lagged by one year. Standard errors are clustered at the state of incorporation level. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. Variable definitions are in Appendix A.

	(1)	(2)	(3)	(4)	(5)
			ADOPTION		
EMPLOYMENT_RATE	5.292 (0.73)	5.812 (0.81)	5.354 (0.73)	4.661 (0.62)	6.277 (0.82)
REAL_GDP	0.116 (0.31)	0.096 (0.25)	0.111 (0.30)	0.124 (0.33)	0.130 (0.32)
REAL_GDP_PER_CAPITA	-23.662 (-0.38)	-25.993 (-0.42)	-26.766 (-0.43)	-22.322 (-0.36)	-35.159 (-0.54)
REPUBLIC_GOVERNOR	-0.333 (-0.56)	-0.312 (-0.52)	-0.321 (-0.54)	-0.364 (-0.61)	-0.339 (-0.56)
AVERAGE_PATENTS	0.773 (0.96)				-10.400 (-1.47)
AVERAGE_FORWARD_CITATIONS		0.491 (1.32)			1.641 (1.47)
AVERAGE_EXPLORATORY_PATENTS			1.430 (1.12)		7.956 (1.33)
AVERAGE_EXPLOITATIVE_PATENTS				1.298 (1.07)	5.093 (1.00)
N	553	553	553	553	553

Table IA3. Majority Voting Legislation and Innovation: CEO without Outside Directorships

In this table, we report the results for testing an alternative explanation based on CEO incentives. We use a subsample in which CEOs do not have any outside directorships throughout our entire sample period. The dependent variables are PATENTS, FORWARD_CITATIONS, EXPLORATORY_PATENTS and EXPLOITATIVE_PATENTS, respectively, in columns 1 through 4. PATENTS is the natural logarithm of one plus the number of patents. FORWARD_CITATIONS is the natural logarithm of one plus the number of adjusted citations of a firm's patents. EXPLORATORY_PATENTS is the natural logarithm of one plus the number of exploratory patents. EXPLOITATIVE_PATENTS is the natural logarithm of one plus the number of exploitative patents. MV is a dummy variable that equals one if majority voting legislation is in effect in the state and zero otherwise. In all columns, we control for other variables as included in Table 4. Variable definitions are provided in Appendix A. Robust standard errors clustered at the state of incorporation level are reported in parentheses. The superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	PATENTS	FORWARD_CITATIONS	EXPLORATORY_PATENTS	EXPLOITATIVE_PATENTS
MV	-0.043*** (0.011)	-0.052*** (0.013)	-0.035*** (0.012)	0.006 (0.008)
Other controls	Y	Y	Y	Y
HQ region \times Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
N	33,738	33,738	33,738	33,738
Adjusted R ²	0.871	0.816	0.806	0.833