

# Republican Managers and Innovation

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## Abstract

We examine how managers' political orientations and ideologies affect a major corporate policy decision: innovative production. We conjecture that Republican managers are likely to have conservative personal philosophies that will spill over to their corporate decision-making. Using managers' personal political contributions and the September 11 attacks as an exogenous shock to conservatism, we find that over the 1992-2006 period, firms with Republican CEOs and managers produced less innovation, as measured by the number of patents produced. Moreover, the innovations produced by Republican managers are smaller and less varied in terms of both their impact and their originality.

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## 1. Introduction

Silicon Valley is considered a major hub for innovation and technology and is home to many of the world's largest tech companies, thousands of tech startups, and numerous venture capitalists. In 2011 alone, Silicon Valley accounted for 41% of all of the venture capital investments made in the US (Kramer and Patrick, 2012). Moreover, many of these companies' CEOs and their employees are strong supporters of the Democratic Party. Salient examples include the late Steve Jobs, Yahoo CEO, Marissa Mayer, and LinkedIn cofounder, Reid Hoffman. Santa Clara Valley, which is mostly occupied by the Silicon Valley, and the San Francisco Bay Area generally are considered hotspots for Democrats, with Democratic presidential nominees achieving margins that are more than 40% higher than those of their Republican counterparts (Silver, 2012). This observation has prompted us to ask whether Democrats are better innovators.

For more than a decade, a growing literature has been documenting evidence of the effect of managerial personal traits and characteristics on firm decisions. This literature began with Bertrand and Schoar (2003), who have shown that CEOs' time-invariant traits explain a significant portion of various firm decisions. In this paper, our focus is on one specific trait: managers' political philosophy and ideology. More specifically, we focus on where managers lie on the conservative-liberal spectrum.

The conservative-liberal spectrum of political ideology can be matched almost perfectly to a Republican-Democrat spectrum, as evidenced by the 0.90 correlation in an American National Election Studies (ANES) survey between respondents' choice of ideology (i.e., liberal versus conservative) and their voting decisions for US Presidential candidates over the period 1972-2004. The survey showed that approximately 80% of respondents who declared themselves "liberal" or "extremely liberal" voted for Democratic candidates, whereas 80% of those who declared themselves "conservative" or "extremely conservative" voted for Republican candidates (Jost, 2006).

This conservatism has been shown not to be constrained to the political realm; it spills over into other dimensions of people's lives. Of particular interest to us here is how political conservatism affects individuals' financial decisions. Recently, several papers have documented the effect of such a spillover of political conservatism on the financial conservatism of CEOs and other C-suite managers (Hutton, Jiang, and Kumar, 2014), equity analysts (Jiang, Kumar, and Law, 2014), mutual fund managers (Di Giuli and Kostovetsky, 2014; Hong and Kostovetsky, 2012), and individual investors (Bonaparte, Kumar, and Page, 2012; Kaustia and Torstila, 2012).

Republicans, who tend to espouse conservative philosophies, also tend to have a greater level of aversion toward ambiguity, complexity, and uncertainty (Jost et al., 2007; Wilson, 1973). Accordingly, we expect Republican managers to avoid highly risky and uncertain endeavors such as innovative projects. In their quest to develop new technologies, create new trends, or put forward new products or services, innovative projects require significant capital outlays with relatively low

levels of certainty. This combination of large capital investments and uncertain, belated outcomes makes such projects risky; therefore, we posit that firms with Republican managers produce fewer innovations.

To examine this issue, we start by identifying managers' political leanings and conservatism by examining firm managers' personal political contributions. Our measurement of a manager's political leanings follows that of Hong and Kostovetsky (2012) and Hutton, Jiang, and Kumar (2014), who used the Federal Elections Commission's (FEC) political-contributions data. Hutton, Jiang, and Kumar (2014) have shown that managers' personal political contributions represent their own political leanings, not those of their firms.

We measure firms' innovation output using two measures. The first measure is the number of patents applications filed with the US Patents and Trademarks office during a given year. Because patents differ significantly in their importance and impact, we supplement this measure with our second measure: the total number of citations (Trajtenberg, 1990). The total number of citations represents all of the citations that the patents applied for during a given year later receive in newer patent applications.

Managers tend to be matched to firms with similar traits and characteristics (Graham, Harvey, and Puri, 2012), thus creating an endogeneity problem in our empirical analysis. To overcome this problem, we use an exogenous shock to the manager's level of conservatism to isolate the treatment effect from the selection effect (Roberts and Whited, 2012). Using the September 11 attacks as an exogenous shock to conservatism, we estimate a difference-in-difference model over the period 1992-2006 in which we find that firms with Republican-leaning CEOs and Republican-leaning top managerial teams produce less innovation. The lower level of innovation created by Republican managers is evidenced by their lower number of patents and those patents' lower citation counts. We arrive at this finding while taking into account the level of R&D spending.

To check the robustness of our results, we perform three additional tests. The first test is a falsification test in which we first assume that the treatment or the shock occurred several years before its actual onset and then observe its effect. The second test involves looking at a smaller time window around the shock both to better capture its immediate effect and to avoid any other factors influencing the results. The third test uses alternative measures of innovation: the originality and generality scores. The robustness tests confirm our original findings.

The findings in our paper are consistent with prior evidence in the literature showing that managers exhibit consistency in their choices and behaviors across their personal and professional lives. It has been shown that decisions made by managers at the firm level match personal decisions that they make with respect to leverage (Cronqvist, Makhija, and Yonker, 2012), risk taking (Cain and McKeon, 2012), and taxes (Chyz, 2013).

This paper contributes to the growing literature on managerial attributes and how they affect various firm decisions. This literature has documented the significant effect on firm policies of

various personal traits, including managerial fixed effects (Bertrand and Schoar, 2003; Graham, Li, and Qui, 2012; Li and Coles, 2011), overconfidence (Malmendier and Tate, 2005), optimism (Heaton, 2002), early life experiences (Malmendier, Tate, and Yan 2011), political orientation (Hutton, Jiang, and Kumar, 2014), and narcissism (Chatterjee and Hambrick, 2007). Our paper differs from these contributions by examining how political orientation and personal ideology affect the generation of innovations: we expect conservatism to exert a major amount of inertia.

Our paper also contributes to the literature that examines corporate innovation and its drivers. This literature has shown that innovation generation in firms can be affected by factors that are either internal to the organization (such as a firm's tolerance for failure (Tian and Wang, 2014), anti-takeover provisions (Chemmanur and Tian, 2012), executive compensation and managerial characteristics (Lin et al., 2011)) or external to the organization (such as its competitive environment (Huse, Neubaum, and Gabrielsson, 2005), credit supply (Amore, Schneider, and Žaldokas, 2013), and banking competition (Cornaggia et al., 2015)). We identify managers' Republicanism as an additional internal variable to the organization that affects a firm's innovation generation and performance.

The rest of the paper proceeds as follows. Section 2 develops the hypothesis. Section 3 discusses the data and variable construction. Section 4 tests the relationship between Republican managers and innovative activities. Section 5 provides several robustness tests. Section 6 concludes.

## **2. Hypothesis Development**

An individual's ideology is a major driver of his decisions (Apter, 1964). Merriam-Webster dictionary defines ideology as "a manner or the content of thinking characteristic of an individual, group, or culture." In other words, it is "the organization of opinions, attitudes, and values" (Adorno et al., 1950). One vivid manner in which individuals classify their ideologies is through self-identification either along the conservative-liberal continuum or the left-right continuum, with both continuums having significant overlap (Conover and Feldman, 1981; Himmelstein, 1992; Jost, 2006; Jost et al., 2003).

Conservative individuals are generally opposed to change and are not open to experience (Conover and Feldman, 1981; Joe, Jones, & Ryder; Jost et al., 2003). Furthermore, conservatives work hard to avoid uncertainty and threat (Jost et al., 2007; Wilson, 1973), do not engage in sensation-seeking activities (Kish, Netterberg, & Leahy, 1973), prefer conventional and familiar choices (Glasgow, Cartier, & Wilson, 1985; Wilson, 1975), place greater value on job security (Atieh, Brief, & Vollrath, 1987), and dislike ambiguity (Hinze, Doster, & Joe, 1997). Most importantly, conservatives dislike creativity, curiosity, and novelty seeking (Carney et al., 2008), all of which are important inputs in innovation.

One can observe an individual's choice of ideology through his choice of political party. Conservatives have been found to vote for the Republican Party, whereas liberals have a strong tendency to vote for the Democratic Party. Using data that goes back to the 1972 presidential

elections, Jost (2006) has found that the correlation between ideology and choice of political party exceeds 0.90. These numbers and findings are further supported by the analysis of the 1952-2004 ANES and the 2004 US National Exit Poll by Abramowitz and Saunders (2006).

Accordingly, we hypothesize that conservative managers, who reveal their conservatism by associating with the Republican Party, dislike novelty seeking and creativity and therefore produce less innovation in their firms. This hypothesis is consistent with the findings of Hutton, Jiang, and Kumar (2014), who have reported that firms with Republican managers exhibit more conservative corporate policies, as demonstrated by having less leverage, lower capital expenditures, lower R&D, and fewer risky investments.

### **3. Data and Descriptive Statistics**

Our sample is constructed through the use of several databases. Information on firms' top management and their compensation is obtained from Standard & Poor's Execucomp database. The accounting data are obtained through Compustat, with stock returns obtained from CRSP. Data on patents are from the NBER 2006 patent database.

We look at all of the firm's top management, as reported by Execucomp. Using the full names of managers provided by Execucomp, we match them to their individual contributions as reported by the Federal Elections Commission (FEC).

Our sample therefore consists of firms at the intersection of Execucomp, Compustat, CRSP, the FEC database, and the NBER patent database. The sample includes both firms with no patent data and firms whose managers did not make any political contributions. Financial firms and utilities are excluded. The final sample consists of 1,644 firms over the sample period 1992-2006, resulting in 13,753 firm-year observations with 3,112 CEOs.

In the sections below, we discuss in detail both our measure for innovation and our measure for the political orientation of the CEO and the entire managerial team. We also discuss other explanatory variables used and provide data statistics for the entire set of variables.

#### **a. Political Orientation Measure**

The FEC publicly discloses any contributions made exceeding \$200 on its website at <http://www.fec.gov>. Each disclosure contains the following information: the name of the donor, the size of the donation, the committee receiving the donation, and the committee's party affiliation. We use this information to identify managers' political orientation by collecting information about their contributions to Republican and/or Democratic candidates for the Senate, the House of Representatives, and the Presidency, along with contributions to party committees, over the period 1992-2006. We collect information about only managers' individual political contributions and do not include firms' Political Action Committees (PAC), which tend to contribute to different parties simultaneously (Cooper, Gulen, and Ovtchinnikov, 2010).

The data on individual contributions include the contributor’s name, address, occupation, and contribution amount. The occupation data usually include information such as employer’s name and job title. We use the contributor’s name, employer, and year of contribution to match the FEC and Execucomp data. We identify 43,752 distinct contributions made by 14,078 unique managers over our sample period. As stated above, our manager universe includes the CEO and top management team as reported in Execucomp.

We move next to transform the individual contributions data into a measure of the political orientation of the manager and consequently, of the top management team. We do this by following the procedure of Hutton, Jiang, and Kumar (2014). We start by creating a manager dummy variable for Republicanism (REPDUMMGR). This dummy variable is used to identify strongly Republican managers and thus takes the value of one if the manager’s political contributions were completely directed toward the Republican Party in a given year and zero otherwise.

Next, we create an index of each manager’s Republicanism (REPMGR). We calculate the average value of REPDUMMGR across all years in which the manager contributed. A manager who never politically contributes is recorded as having a REPMGR of zero (Hong and Kostovetsky, 2012; Hutton, Jiang, and Kumar, 2014). Therefore, we can interpret the variable REPMGR as the percentage of time the manager showed solid support for the Republican Party. This variable would be a time-invariant variable for each manager across every year that the manager exists in the Execucomp universe regardless of whether a contribution was made during that year.

Finally, we compute the firm-level index of Republicanism (REP) by aggregating the REPMGR for a given firm at each time  $t$ . The aggregation is performed in a weighted manner in which the weight received by each manager is  $\omega$ /salary rank as reported in Execucomp.  $\omega$  is chosen based on the number of top-five managers reported by Execucomp for a given firm-year such that,

$$\sum_{k=1}^K \frac{\omega_{ij}}{rank_{ijk}} = 1,$$

where  $i$  stands for firm,  $j$  for year, and  $k$  for executive. This is done because there are cases in which the number of top-five managers reported by Execucomp is less than 5. This weighting scheme is done to reflect each manager’s importance in the firm’s decision-making process.

REP, a firm’s Republicanism index, ranges from zero to 1, where one indicates that the firm’s managers are strong supporters of the Republican Party. Conversely, an REP of zero indicates that a firm’s managers are either strong supporters of the Democratic Party, failed to make any contributions, or contributed in a manner that is not reported by the FEC.

Hutton, Jiang, and Kumar (2014) have performed various validation tests (e.g., self-reported party affiliation) to ensure that the measure truly captures the manager’s political orientation, finding that the measure succeeds in doing so.

## **b. Innovation Measure**

We measure innovation by looking at the firm's innovative output, which is measured by the number of patents a firm produces and the number of citations that those patents receive. Measuring innovation through patents and citations provides information that goes beyond that conveyed by the R&D measure (Hall, 1999).

Our source for patent data is the NBER 2006 patent database (Hall, Jaffe, and Trajtenberg, 2001). The database includes patent grants and citations from 1976-2006. The database includes only patents that have been granted. We use the year of the patent application as the year of the patent instead of the year of the patent grant because the application year better captures when the patent was produced (Griliches, Pakes, & Hall, 1988). There is a two-year delay between patent application and patent grant that is primarily caused by the granting authorities' administrative processes. Therefore, patents applied for in 2004 and 2005 might not appear in the sample.

The number of patents produced is a good measure of innovation; however, it is an imperfect measure because not all patents have the same economic and/or technical value (Griliches, Pakes, and Hall, 1988). To better capture the importance of a patent, we supplement the number of patents applied for in a given year with the total numbers of citations received by those patents. It has been found that a patent's citation is related both to its social value (Trajtenberg, 1990) and to the firm's value, as measured by Tobin's Q (Hall, Jaffe, and Trajtenberg, 2005).

## **c. Other Explanatory Variables**

To explain patenting activity, we control for R&D expenditures, firm size, and capital intensity, as in Hall and Ziedonis (2001), Galasso and Simcoe (2011), and Hirshleifer, Teoh, and Low (2012). R&D is defined as total R&D expenditures scaled by total assets. Firm size is defined as the natural logarithm of total assets. Capital intensity is proxied with the natural logarithm of the ratio of total assets to the number of employees.

Whereas econometric specifications look only at the CEO's Republicanism and that of the entire top management team, we also consider the CEO's tenure and incentives. More specifically, we control for the CEO's delta and the CEO's option-holdings vega. A CEO's delta is defined as the dollar change in the CEO's total equity and options portfolio given a 1% change in the stock price. The delta measure looks at the CEO's incentive to increase the firm's stock price. A CEO's vega is defined as the dollar change in the CEO's total option holdings given a 1% change in the stock return's volatility. The vega measure captures the size of the CEO's incentive to increase the firm's risk. The CEO's delta and vega are computed using the 1-year approximation method of Core and Guay (1999, 2002).

## **d. Descriptive Statistics**

Table I provides descriptive statistics. Panel A provides summary statistics on political-orientation measures at the firm level. We can observe that firms tend to be managed by Republican managers, as seen by the REP measure's average (median) value of 0.379 (0.401). The CEO measure of political orientation, REP<sub>CEO</sub>, is skewed towards the Republican Party, with an average (median) of 0.501 (0.500).

In Panel B, we see summary statistics for our measures of innovation, number of patents and total citations. Panel C lists summary statistics for the various control variables used in our econometric specifications.

#### **4. Political Orientation and Innovative Activity**

In this section, we present our main findings by examining how managers' political orientation affects their innovative activity in the firm.

##### **a. 9/11 as an Exogenous Shock**

As mentioned above, managers are endogenously matched to their firms. For our hypothesis, one could make the argument that Republican managers are matched to conservative firms. This would eventually drive a negative relationship between our REP measures and innovation. Therefore, because of the possibility of omitted variables, any finding from running a simple OLS regression in which we regress innovation on REP cannot be construed as evidence of a causal effect.

To overcome this problem, we use an exogenous shock to the manager's level of conservatism to isolate the treatment effect from the selection effect. The exogenous shock that we use is the September 11, 2001, attack(s) on the World Trade Center. This shock was completely exogenous and generated significant shifts in individuals' political orientation and level of conservatism. A shift towards conservatism and conservative thinking has been documented with the 9/11 attacks and other terrorist threats and activities (for example Bonanno and Jost, 2006; Echebarria-Echabe and Fernández-Guede, 2006; Nail et al., 2009). Furthermore, this effect did not occur exclusively in the period immediately after September 11, 2001; instead, it continued for several years as the level of terrorist threats fluctuated (Willer, 2004). Thus, we conjecture that given managers shift towards conservatism coupled with significant levels of threat and uncertainty, elements disliked by conservatives, we will observe a greater decrease in the innovative activity of conservative managers than do other managers.

We further augment the use of exogenous shock with the use of firm-fixed effects to capture any unobserved firm-invariant effects. The use of firm-fixed effects when examining the effect of managers' personal traits on firms' decisions and activities has been widely used to assist in capturing causal effects (for example Malmendier and Tate, 2005; Malmendier, Tate, and Yan, 2011; Hirshleifer, Low, and Teoh, 2012). All standard errors are bootstrapped.

##### **b. CEOs' Political Orientation and Innovative Activity**

Table 2 shows the Diff-in-Diff estimates for the relationship between a CEO's political orientation and the level of innovation using the September 11 attacks as an exogenous shock. The dependent variables are our measures of innovation, the number of patents and the total number of citations. The control variables are based on Hall and Ziedonis (2001), Galasso and Simcoe (2011), and Hirshleifer, Teoh, and Low (2012). Because our dependent variables are count variables, we estimate the econometric specifications using Poisson regressions.

Table 2 indicates that Republican CEOs produce a smaller number of patents, which receive fewer citations. The effect is stronger and more robust for the citations measure of innovation with the coefficient of interest,  $REP_{CEO} * Sep\ 11$ , decreasing to -0.4215 and its  $p$ -value decreasing to 0.012.

Using the estimates from model (1), we can see that a one-standard-deviation increase in the CEO's Republicanism following September 11 would result in a 35.8% drop in the number of patents produced. The estimates from model (2) would indicate that a 0.1 increase in the CEO's Republicanism following September 11 would result in a 6.6% drop in the number of citations of the patents. If we examine a change in the CEO's Republicanism from the 25<sup>th</sup> percentile to the 75<sup>th</sup> percentile, a change with a magnitude of 1 following September 11 would lead to a 66.6% drop in the number of citations that the patents receive. These drops are not only statistically significant but also economically meaningful.

Therefore, we take this as evidence that Republican CEOs produce less innovation in their firms.

### **c. Top Management Political Orientation and Innovative Activity**

Table 3 uses the same econometric specification of Table 2 to show the relationship between the top management team's political orientation and innovative activity within the firm. Because we are now looking at the entire management team, we no longer use the CEO-specific control variables, tenure and incentive measures.

Table 3 shows us that there is a negative relationship between the political orientation of the firm's top management and its innovation across both measures of innovation—patents and citations—as in Table 2. Using model (1), a one-standard-deviation increase in managers' Republicanism following September 11 would result in a 24% drop in the number of patents produced. If we look at the importance of these patents as measured by their total citations, we find a stronger effect of the managers' Republicanism. A one-standard-deviation increase in REP following September 11 would result in a 22.1% drop in citations received.

Overall, this would indicate that Republicanism is associated with lower patent production and lower citations.

## **5. Robustness Checks**

In this section we perform several additional tests to check for the robustness of our earlier findings.

### **a. Placebo Test**

Our identification strategy relies on the assumption that Republican CEOs dislike uncertainty and therefore, when faced with events that significantly raise the level of uncertainty in the economy, respond by investing less in risky endeavors, in our case innovation production. The September 11 attacks provided us with an ideal setting in which our assumption is likely to hold. Therefore, in periods of less uncertainty, we should expect to find different effects of Republicanism on innovation. To test for this, we perform a placebo test in which we repeat our Diff-in-Diff analysis on a pre-event year. In other words, we assume that the treatment occurred several years before it actually did. In this case, the false treatment should have a statistically insignificant differential estimate. By doing this, we show that the observed change in our earlier Diff-in-Diff estimates is due to the treatment effect, not an alternative factor.

In Table 4, we re-estimate our earlier econometric specification while setting the treatment to have occurred in 1996 instead of 2001. We can see from Table 4 that the false treatment has no differential effect on the innovative activity of the treatment group (i.e., Republican CEOs) and the control group (i.e., non-Republican CEOs), as seen from the statistically insignificant coefficient for the interaction term  $REP*False\ Year$  and  $REP_{CEO}*False\ Year$ . This finding supports our previous notion that Republican managers produce less innovation due to its more uncertain outcomes.

### **b. Shorter Window**

In our earlier analysis, we looked at the entire sample ranging from 1992 to 2006. A more stringent test of our assumption about September 11 would be to examine the effect around a shorter window. If the treatment is true, then we should observe an immediate and concentrated effect for it around its onset. A longer window could potentially increase the potential for other confounding effects to occur and influence innovation.

Therefore, we repeat our analysis by setting it in a (-3, +3) year window around the event. We can see from Table 5 that the results are in line with what was found earlier in Tables 2 and 3 in terms of the coefficients' sizes and significance. This is true for the total number of patents produced, the total number of citations, the estimates accounting for only the CEO's Republicanism and the estimates accounting for the top managerial team's Republicanism. In other words, we find that the exogenous shock is concentrated around its occurrence, providing additional evidence in support of our hypothesis that Republican managers innovate less.

### **c. Alternative Innovation Measures**

Here, we propose to augment our analysis with two additional measures to assess the quality and creativeness of a firm's innovation. We use patent generality and originality as suggested by Hall, Jaffe, and Trajtenberg (2001). These alternative measures would allow us to further investigate the nature of the innovations generated by Republican managers. The generality score measures the

degree to which various fields cite the patent and is computed as one minus the Herfindahl Index of the three-digit technology class distribution of all of the patents that cite it. The originality score measures how a patent's uniqueness and novelty in using knowledge from various fields in its development; it is computed as one minus the Herfindahl Index of the three-digit technology class distribution of all the patents it cites.

As pointed out earlier, Republicans have been shown to avoid ambiguity and uncertainty, preferring the familiar and conventional. Therefore, as we argued earlier, Republicans produce less innovation. Moreover, because they are conventional when there is a requirement to innovate, Republican managers tend to seek less radical innovations with more certain outcomes (March, 1991). This certainty manifests itself in lower variations in terms of an innovation's impact and originality. Therefore, we would expect Republican CEOs to produce patents with less variation in their originality and generality scores.

Table 6 reports an OLS estimate for our base econometric specification with the standard deviations of the originality and generality scores as dependent variables. We can see that across the four models, Republican CEOs and Republican managers exhibit statistically and economically significant drops in the variation of their patent impact and originality, as measured by the volatility of the generality and originality scores. In model (1) in Table 6, we can see that a Republican CEO after September 11 would have a generality score standard deviation approximately 0.35 lower than that of a non-Republican CEO. To obtain a sense of the economic magnitude of this difference, a 0.35 drop is 27% of the average value of the generality score's standard deviation. We can correspondingly say the same for the originality score's standard deviation, which is estimated in model (2) from the table. A Republican CEO would have a volatility that is approximately 0.27 lower than a non-Republican CEO in the post-September 11 period. This would constitute a drop of approximately 21% compared to the average value for the volatility of the originality scores of the firm's patents.

We take these results and findings to support our earlier findings that Republican CEOs produce less innovation.

## **6. Conclusion**

In this paper, we examined the effect of managers' political ideology and conservatism on their firms' innovation production. We hypothesize that Republican managers, who tend to have conservative personal values, will produce a smaller degree of innovation. We make the leap from managers' personal decisions to their corporate decisions based on the findings of the extant literature showing behavioral consistency across the two types of decisions. We expect Republican managers to produce less innovation given innovative projects' risky and uncertain nature, a feature that conservatives dislike.

Using managers' personal political contributions to measure their political leanings, we find that over the period 1992-2006, Republican CEOs produced less innovation in their firms. We measure

innovation using the total number of patents produced during the year and the total count of citations received by these patents. To establish this causal link, we use the September 11 attacks as an exogenous shock to managerial conservatism and show, using a Diff-in-Diff methodology, that Republican managers have a greater drop in their innovation production following this shock.

This paper adds to the literature on managerial attributes by showing how managers' personal political ideologies affect a major corporate policy: innovative production. The paper's findings also have significant implications for firms and their boards with respect to choosing CEOs and other members of the top management team. The choice of a Republican or Democratic manager should be tied to the firm's future direction in terms of innovative investments and production.

## References

- Abramowitz, A. I., & Saunders, K. L. (2006). Exploring the bases of partisanship in the American electorate: Social identity vs. ideology. *Political Research Quarterly*, 59(2), 175-187.
- Adorno, T. W., Frenkel-Brunswik, E., Levinson, D. J., & Sanford, R. N. (1950). The authoritarian personality.
- Amore, M. D., Schneider, C., & Žaldokas, A. (2013). Credit supply and corporate innovation. *Journal of financial economics*, 109(3), 835-855.
- Apter, D. E. (Ed.). (1964). *Ideology and discontent* (pp. 15-46). New York: Free Press.
- Atieh, J. M., Brief, A. P., & Vollrath, D. A. (1987). The Protestant work ethic-conservatism paradox: beliefs and values in work and life. *Personality and Individual Differences*, 8(4), 577-580.
- Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics*, 118(4), 1169.
- Bonanno, G. A., & Jost, J. T. (2006). Conservative shift among high-exposure survivors of the September 11th terrorist attacks. *Basic and Applied Social Psychology*, 28(4), 311-323.
- Bonaparte, Y., Kumar, A., & Page, J. K. (2012). *Political climate, optimism, and investment decisions*. Paper presented at the AFA 2012 Chicago Meetings Paper.
- Cain, M. D., & McKeon, S. B. (2014). CEO personal risk-taking and corporate policies. *Journal of Financial and Quantitative Analysis (JFQA)*, Forthcoming.
- Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The secret lives of liberals and conservatives: Personality profiles, interaction styles, and the things they leave behind. *Political Psychology*, 29(6), 807-840.
- Chatterjee, A., & Hambrick, D. C. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly*, 52(3), 351.
- Chemmanur, T. J., & Tian, X. (2012). Do Anti-Takeover Provisions Spur Corporate Innovation? *AFA 2012 Chicago Meetings Paper*.
- Chyz, J. A. (2013). Personally tax aggressive executives and corporate tax sheltering. *Journal of Accounting and Economics*, 56(2), 311-328.
- Coles, J. L., & Li, Z. F. (2012). An empirical assessment of empirical corporate finance. *Available at SSRN 1787143*.
- Conover, P. J., & Feldman, S. (1981). The origins and meaning of liberal/conservative self-identifications. *American Journal of Political Science*, 617-645.
- Cooper, M. J., Gulen, H., & Ovtchinnikov, A. V. (2010). Corporate political contributions and stock returns. *The Journal of Finance*, 65(2), 687-724.

- Core, J., & Guay, W. (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of accounting and economics*, 28(2), 151-184.
- Core, J., & Guay, W. (2002). Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research*, 40(3), 613-630.
- Cornaggia, J., Mao, Y., Tian, X., & Wolfe, B. (2015). Does banking competition affect innovation? *Journal of financial economics*, 115(1), 189-209.
- Cronqvist, H., Makhija, A. K., & Yonker, S. E. (2012). Behavioral consistency in corporate finance: CEO personal and corporate leverage. *Journal of financial economics*, 103(1), 20-40.
- Di Giuli, A., & Kostovetsky, L. (2014). Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of financial economics*, 111(1), 158-180.
- Echebarria-Echabe, A., & Fernández-Guede, E. (2006). Effects of terrorism on attitudes and ideological orientation. *European Journal of Social Psychology*, 36(2), 259-265.
- Galasso, A., & Simcoe, T. S. (2011). CEO overconfidence and innovation. *Management Science*, 57(8), 1469-1484.
- Glasgow, M. R., Cartier, A. M., & Wilson, G. D. (1985). Conservatism, sensation-seeking and music preferences. *Personality and Individual Differences*, 6(3), 395-396.
- Graham, J. R., Li, S., & Qiu, J. (2012). Managerial attributes and executive compensation. *Review of Financial Studies*, 25(1), 144-186.
- Griliches, Z., Pakes, A., & Hall, B. H. (1988). The value of patents as indicators of inventive activity.
- Hall, B. H. (1999). *Innovation and market value* (No. w6984). National bureau of economic research.
- Hall, B. H., Jaffe, A. B., & Trajtenberg, M. (2001). *The NBER patent citation data file: Lessons, insights and methodological tools* (No. w8498). National Bureau of Economic Research.
- Hall, B. H., Jaffe, A., & Trajtenberg, M. (2005). Market value and patent citations. *RAND Journal of economics*, 16-38.
- Hall, B. H., & Ziedonis, R. H. (2001). The patent paradox revisited: an empirical study of patenting in the US semiconductor industry, 1979-1995. *RAND Journal of Economics*, 101-128.
- Heaton, J. B. (2002). Managerial optimism and corporate finance. *Financial Management*, 33-45.
- Himmelstein, J. L. (1992). *To the right: The transformation of American conservatism*. Univ of California Press.
- Hinze, T., Doster, J., & Joe, V. C. (1997). The relationship of conservatism and cognitive-complexity. *Personality and Individual Differences*, 22(2), 297-298.

- Hirshleifer, D., Low, A., & Teoh, S. H. (2012). Are overconfident CEOs better innovators?. *The Journal of Finance*, 67(4), 1457-1498.
- Hong, H., & Kostovetsky, L. (2012). Red and blue investing: Values and finance. *Journal of Financial Economics*, 103(1), 1-19.
- Huse, M., Neubaum, D. O., & Gabrielson, J. (2005). Corporate innovation and competitive environment. *The International Entrepreneurship and Management Journal*, 1(3), 313-333.
- Hutton, I., Jiang, D., & Kumar, A. (2014). Corporate policies of Republican managers. *Journal of Financial and Quantitative Analysis*, 49, 1279-1310.
- Jiang, D., Kumar, A., & Law, K. (2014). Political contributions and analyst behavior. *McCombs Research Paper Series No. FIN-01-12*.
- Joe, V. C., Jones, R. N., & Ryder, S. (1977). Conservatism, openness to experience and sample bias. *Journal of Personality Assessment*, 41(5), 527-531.
- Jost, J. T. (2006). The end of the end of ideology. *American Psychologist*, 61(7), 651.
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological bulletin*, 129(3), 339.
- Jost, J. T., Napier, J. L., Thorisdottir, H., Gosling, S. D., Palfai, T. P., & Ostafin, B. (2007). Are needs to manage uncertainty and threat associated with political conservatism or ideological extremity? *Personality and Social Psychology Bulletin*, 33(7), 989-1007.
- Kaustia, M., & Torstila, S. (2011). Stock market aversion? Political preferences and stock market participation. *Journal of financial economics*, 100(1), 98-112.
- Kish, G. B., Netterberg, E. E., & Leahy, L. (1973). Stimulus-seeking and conservatism. *Journal of clinical psychology*, 29(1), 17-20.
- Kramer, B. J., & Patrick, M. J. (2012). Venture Capital Survey Silicon Valley Fourth Quarter 2011. 2015
- Lin, C., Lin, P., Song, F. M., & Li, C. (2011). Managerial incentives, CEO characteristics and corporate innovation in China's private sector. *Journal of Comparative Economics*, 39(2), 176-190.
- Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The journal of finance*, 60(6), 2661-2700.
- Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies. *The Journal of finance*, 66(5), 1687-1733.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization science*, 2(1), 71-87.
- Nail, P. R., McGregor, I., Drinkwater, A. E., Steele, G. M., & Thompson, A. W. (2009). Threat causes liberals to think like conservatives. *Journal of Experimental Social Psychology*, 45(4), 901-907.

Silver, N. (2012). In Silicon Valley, Technology Talent Gap Threatens G.O.P. Campaigns. Retrieved from [http://fivethirtyeight.blogs.nytimes.com/2012/11/28/in-silicon-valley-technology-talent-gap-threatens-g-o-p-campaigns/?\\_r=0](http://fivethirtyeight.blogs.nytimes.com/2012/11/28/in-silicon-valley-technology-talent-gap-threatens-g-o-p-campaigns/?_r=0)

Tian, X., & Wang, T. Y. (2014). Tolerance for failure and corporate innovation. *Review of Financial Studies*, 27(1), 211-255.

Trajtenberg, M. (1990). A penny for your quotes: patent citations and the value of innovations. *The Rand Journal of Economics*, 172-187.

Willer, R. (2004). The effects of government-issued terror warnings on presidential approval ratings. *Current research in social psychology*, 10(1), 1-12.

Wilson, G. D. (1973). A dynamic theory of conservatism.

Wilson, G. D. (1975). *Manual for the Wilson-Patterson attitude inventory (WPAI)*: NFER.

## Appendix

Variable	Description
Dependent variable	
Number of Patents	The total number of patents applied for during the year.
Total Citations	The total number of citations received by all patents applied for during the year, adjusted for truncation bias using the weighting index of Hall, Jaffe, and Trajtenberg (2001).
Variables relating to managerial Republicanism	
REPDUMMGR	A dummy variable that takes the value of one if the manager's political contributions were completely directed towards the Republican Party in a given year, and zero otherwise.
REPMGR	The average value of REPDUMMGR across all the years in which the manager makes political contributions.
REP <sub>CEO</sub>	The REPMGR for the CEO.
REP	A weighted average of the top five managers' REPMGR at the firm level, where each manager's weight is the inverse of his pay rank. Non-donors receive a REPMGR score of zero.
Other independent variables	
Capital Intensity	The natural logarithm of the ratio of total assets to the total number of employees.
CEO Tenure	CEO tenure in years.
CEO Delta	Dollar change in CEO's stock and option portfolio for a 1% change in stock price.
CEO Vega	Dollar change in CEO's option holdings for a 1% change in stock return volatility.
False Year	A dummy variable equal to 1 if the year is after 1996, zero otherwise.
R&D	The ratio of R&D expenditures to total assets.
Sep 11	A dummy variable equal to 1 if the year is following the September 11, 2001, attacks, zero otherwise.
Size	The natural logarithm of the firm's total assets.

## Table 1: Summary Statistics

Panel A reports firm-level political orientation measures. REP is the Republican index for the top five managers based on their political contributions. REP<sub>CEO</sub> is the CEO's Republican index based on the CEO's own political contributions. Panel B reports the summary statistics for the dependent variables. Panel C reports the summary statistics for the control variables. Variable definitions are provided in the appendix. The sample consists of all nonfinancial and nonutility firms in Execucomp over the period 1992-2006.

<b>Panel A: Political Orientation Measures</b>						
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>25<sup>th</sup> Percentile</b>	<b>Median</b>	<b>75<sup>th</sup> Percentile</b>
REP	13,543	0.379	0.308	0.063	0.401	0.635
REP <sub>CEO</sub>	13,543	0.501	0.451	0.000	0.500	1.000

  

<b>Panel B: Dependent Variables</b>						
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>25<sup>th</sup> Percentile</b>	<b>Median</b>	<b>75<sup>th</sup> Percentile</b>
Number of Patents	13,543	28.213	137.535	0.000	1.000	9.000
Total Citations	7,222	843.25	3,718.0	11.46	70.84	361.5

  

<b>Panel C: Control Variables</b>						
<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>25<sup>th</sup> Percentile</b>	<b>Median</b>	<b>75<sup>th</sup> Percentile</b>
R&D	13,543	0.046	0.108	0.000	0.015	0.062
Total Assets (in \$millions)	13,540	5,750	23,627	396.6	1,062	3,453
Capital Intensity	13,427	5.405	0.929	4.833	5.380	5.969
CEO Tenure	13,018	6.743	7.561	2	5	9
CEO Delta	13,543	532.8	3,890	0.000	80.24	311.7
CEO Vega	13,543	102.4	265.3	0.000	23.33	94.50

**Table 2: CEO Political Orientation and Innovation**

This table reports the results of a Poisson regression of the two innovation measures on the CEO Republican index. *Number of Patents* is the total number of patents applied for during the year. *Total Citations* is the total number of citations received by the patents applied for during the year.  $REP_{CEO}$  is the Republican index for the CEO's political orientation only. Variable definitions are provided in the appendix. All of the regressions include year and firm-fixed effects. All of the standard errors are bootstrapped. p-values are in parentheses below the coefficients. \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	Number of Patents (1)	Total Citations (2)
REP <sub>CEO</sub> *Sep 11	-0.2321** (0.025)	-0.4215** (0.012)
REP <sub>CEO</sub>	0.2088* (0.092)	0.1396 (0.252)
Sep 11	0.1533 (0.125)	0.1646 (0.436)
R&D	0.6598 (0.455)	1.7125** (0.015)
Size	0.7710*** (0.000)	0.7296*** (0.000)
Capital Intensity	-0.5073*** (0.000)	-0.4406*** (0.003)
Ln(1 + CEO Tenure)	0.0643*** (0.006)	0.0804*** (0.009)
CEO Delta	-0.0000 (0.568)	-0.0000 (0.563)
CEO Vega	-0.0000 (0.915)	-0.0000 (0.883)
Observations	10,088	6,449
Year FE	Yes	Yes
Firm FE	Yes	Yes

### Table 3: Top Management Political Orientation and Innovation

This table reports the results of a Poisson regression of the two innovation measures on the top management team's Republican index. *Number of Patents* is the total number of patents applied for during the year. *Total Citations* is the total number of citations received by the patents applied for during the year. REP is the Republican index measuring the political orientation of the top five managers in the firm. Variable definitions are provided in the appendix. All of the regressions include year and firm-fixed effects. All of the standard errors are bootstrapped. p-values are in parentheses below the coefficients. \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	Number of Patents (1)	Total Citations (2)
REP*Sep 11	-0.2512* (0.067)	-0.3334* (0.088)
REP	0.4054** (0.014)	0.3542** (0.028)
Sep 11	0.1504 (0.138)	0.0909 (0.581)
R&D	0.6676 (0.485)	1.8589*** (0.006)
Size	0.7403*** (0.000)	0.6850*** (0.000)
Capital Intensity	-0.4858*** (0.000)	-0.4022*** (0.009)
Observations	10,867	6,935
Time FE	Yes	Yes
Firm FE	Yes	Yes

**Table 4: Falsification Test**

This table reports the results of a Poisson regression of the two innovation measures on the top management team's and the CEO's Republican indexes. *Number of Patents* is the total number of patents applied for during the year. *Total Citations* is the total number of citations received by the patents applied for during the year.  $REP_{CEO}$  is the Republican index for the CEO's political orientation only. Variable definitions are provided in the appendix. All of the regressions include year and firm-fixed effects. All standard errors are bootstrapped. p-values are in parentheses below the coefficients. \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	Number of Patents (1)	Total Citations (2)	Number of Patents (3)	Total Citations (4)
$REP_{CEO}$ *False	-0.1254 (0.133)	-0.1337 (0.292)		
$REP_{CEO}$	0.2219** (0.025)	0.1537 (0.194)		
REP*False			-0.1207 (0.419)	-0.1259 (0.415)
REP			0.4024** (0.027)	0.3625** (0.039)
False	-4.7877*** (0.000)	-7.4178*** (0.005)	-4.7097*** (0.000)	-7.4055*** (0.005)
R&D	0.6568 (0.380)	1.7362*** (0.002)	0.6635 (0.463)	1.8741*** (0.003)
Size	0.7702*** (0.000)	0.7297*** (0.000)	0.7403*** (0.000)	0.6886*** (0.000)
Capital Intensity	-0.5108*** (0.001)	-0.4483** (0.024)	-0.4905*** (0.000)	-0.4085*** (0.005)
$\ln(1 + \text{CEO Tenure})$	0.0661** (0.020)	0.0836** (0.023)		
CEO Delta	-0.0000 (0.572)	-0.0000 (0.512)		
CEO Vega	-0.0000 (0.922)	-0.0000 (0.864)		
Observations	10,088	6,449	10,867	6,935
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

### Table 5: Shorter Window

This table reports the results of a Poisson regression of the two innovation measures on the top management team and the CEO's Republican indexes. The sample period in this table has been limited to a window of (-3, +3) years around the treatment effect, September 11. *Number of Patents* is the total number of patents applied for during the year. *Total Citations* is the total number of citations received by the patents applied for during the year. REP is the Republican index measuring the political orientation of the top five managers in the firm. REP<sub>CEO</sub> is the Republican index for the CEO's political orientation only. Variable definitions are provided in the appendix. All of the regressions include year and industry-fixed effects, defined based on the two-digit SIC. All of the standard errors are clustered at the firm level. p-values are in parentheses below the coefficients. \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	Number of Patents (-3, +3) (1)	Total Citations (-3, +3) (2)	Number of Patents (-3, +3) (3)	Total Citations (-3, +3) (4)
REPCEO*Sep 11	-0.2946** (0.036)	-0.5442*** (0.007)		
REPCEO	0.4669** (0.021)	0.4454** (0.045)		
REP*Sep 11			-0.3951* (0.062)	-0.5905** (0.048)
REP			0.4840* (0.079)	0.5590 (0.113)
Sep 11	-0.0768 (0.704)	-0.0795 (0.744)	0.0144 (0.948)	-0.0904 (0.724)
R&D	1.2527*** (0.000)	4.6060*** (0.000)	1.2749*** (0.000)	4.6996*** (0.000)
Size	1.0281*** (0.000)	0.9662*** (0.000)	1.0295*** (0.000)	0.9429*** (0.000)
Capital Intensity	-0.1569 (0.207)	-0.1045 (0.451)	-0.1994* (0.098)	-0.1405 (0.317)
Ln(1 + CEO Tenure)	0.0848 (0.182)	0.1710** (0.031)		
CEO Delta	-0.0000 (0.164)	-0.0000 (0.200)		
CEO Vega	0.0001 (0.166)	0.0000 (0.843)		
Constant	-4.7882*** (0.000)	-3.1463*** (0.000)	-4.4326*** (0.000)	-2.5931*** (0.000)
Observations	4,749	2,849	5,027	2,989
Time FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

**Table 6: Alternative Innovation Measures**

This table reports the results of an OLS regression of the volatility of the originality and generality scores on the CEO's and the top management team's Republican index. A patent's generality score is computed as one minus the Herfindahl Index of the three-digit technology class distribution of all patents that cite it. A patent's originality score is computed as one minus the Herfindahl Index of the three-digit technology class distribution of all the patents it cites. REP is the Republican index measuring the political orientation of the top five managers in the firm. REP<sub>CEO</sub> is the Republican index for the CEO's political orientation only. Variable definitions are provided in the appendix. All of the regressions include year and firm-fixed effects. All of the standard errors are clustered at the firm level. p-values are in parentheses below the coefficients. \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	Generality SD (1)	Originality SD (2)	Generality SD (3)	Originality SD (4)
REP <sub>CEO</sub> *Sep 11	-0.3495** (0.030)	-0.2732** (0.026)		
REP <sub>CEO</sub>	0.2294 (0.140)	0.1855* (0.050)		
REP*Sep 11			-0.5932*** (0.005)	-0.4184*** (0.009)
REP			0.2982 (0.145)	0.1541 (0.274)
Sep 11	0.4432** (0.016)	0.2125** (0.031)	0.4570*** (0.008)	0.2246** (0.016)
R&D	1.0381*** (0.005)	0.6859** (0.011)	1.1655*** (0.004)	0.7972*** (0.008)
Size	0.6291*** (0.000)	0.5353*** (0.000)	0.6451*** (0.000)	0.5410*** (0.000)
Capital Intensity	-0.3658*** (0.005)	-0.3940*** (0.001)	-0.3379*** (0.008)	-0.3534*** (0.002)
Ln(1 + CEO Tenure)	0.0621* (0.089)	0.0438* (0.073)		
CEO Delta	0.0000 (0.636)	-0.0000 (0.661)		
CEO Vega	0.0001 (0.319)	0.0001 (0.157)		
Constant	-1.4672** (0.026)	-0.4224 (0.409)	-1.6512*** (0.010)	-0.5837 (0.243)
Observations	5,800	5,800	6,207	6,207
Time FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.728	0.831	0.733	0.834