HUMAN VALUES MEET ARTIFICIAL INTELLIGENCE: HOW CEO POLITICAL IDEOLOGY SHAPES TECHNOLOGY ADOPTION

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ABSTRACT

In this paper, we theorize technology adoption as a risky and political strategic choice, and explore how CEO political ideology influences the adoption of new technologies, specifically Artificial Intelligence (AI), within organizations. We argue that due to conservative CEOs' aversion to change and risks, they would be less likely to adopt AI, compared to liberal CEOs. Drawing on a sample of S&P 1500 companies in the U.S., this study finds robust evidence that conservative CEOs are indeed less likely to adopt AI. CEOs' aversion to AI is reinforced by their risk exposure, but mitigated by the exposure to actual risk information about AI in the environment. The findings suggest that CEOs undergo a normative reasoning process based on their political ideology in making decisions about complex technologies, and contribute to the research on upper echelons, AI, and technology adoption.

Upper echelons theory has become a popular lens for understanding strategic decision making in complex management settings (Hambrick, 2007; Hambrick & Mason, 1984). CEO and top management team (TMT) observable characteristics, such as tenure, education, experience, and gender influence strategic change and firm performance (Crossland, Jinyong Zyung, Hiller, & Hambrick, 2014; Dixon-Fowler, Ellstrand, & Johnson, 2013; Lewis, Walls, & Dowell, 2014). Underlying characteristics of CEO and TMT, such as values and personality, are also associated with a broad set of outcomes, ranging from corporate social responsibility (CSR), resource allocation, and tax avoidance, to internationalization (Chin, Hambrick, & Treviño, 2013; Christensen, Dhaliwal, Boivie, & Graffin, 2015; Gupta, Nadkarni, & Mariam, 2019; Marquis & Qiao, 2020).

One aspect of this focus on the values of top managers that has received far less research attention is how values shape technology adoption. As a crucial and complex strategic decision, technology adoption may disrupt traditional hierarchies, power and control within the organizations (Brynjolfsson, 1994; Lebovitz, Levina, & Lifshitz-Assaf, 2021; Lifshitz-Assaf, 2018). The influence of technology adoption within the focal organization may also expand across organizational boundaries to influence customers, competitors, and the whole society, defining new rules of exchange and transaction (Alaimo & Kallinikos, 2022). Whereas the technology itself could be neutral in design, the inexorable changes brought to the organization and the society might be political, redirtributing the power and control of different groups. Technology adoption may give rise to new powerful actors (Kaplan, Milde, & Cowan, 2017; Lifshitz-Assaf, 2018), or legitimize certain values while delegitimizing others (US Congress, 2011). Actors adopting the new technology may need to fight a framing battle, or intentionally avoid it, in order to gain access to resources. For example, scientists in the U.S. have changed the trigger word “climate change”

in their grant applications to “geochemical cycling” or “biogeochemical cycling”, in order to continue advaning the green technology without facing opposition from conservative congress members who remain skeptical of the phenomenon and would challenge into any grants related to “climate change” (AtKisson, 2020; Mervis & Kaiser, 2023).

Values are normative principles that involve clear ordering of consequences and alternatives (Hambrick & Mason, 1984: 195). Political ideology is a set of values about the ideal goals of society and how to get there. In this sense, the political ideology values of corporate elites shape what firms “should” do and how to do it. Among different characterizations of political ideology, the liberal-conservative spectrum has been established as a stable representation of corporate elites’ core values (Chin et al., 2013; Chin & Semadeni, 2017; Gupta, Briscoe, & Hambrick, 2017; Gupta & Wowak, 2017). Following this characterization, a fundamental difference between liberal and conservative CEOs is their preferrable ordering of change and risk versus tradition and stability. Conservative CEOs may genuinely believe that their firm and society at large would thrive on respect for tradition and stability an be cautious about the changes and risk brought on by new technologies. By contrast, liberal CEOs may genuinely believe that their firm and society at large should actively and boldly embrace change and risk, which they see as the way towards genuine social progress.

In this paper, we explore how CEO political ideology affects technology adoption and, in particular, shapes the extent to which they to adopt and integrate Artificial Intelligence (AI) within the firm. We argue that political ideology shapes the perception, action, and socialization of CEOs in complex and uncertain situations, such as the adoption of new technologies. We build on upper echelons theory (Chin et al., 2013; Hambrick & Mason, 1984) to theorize how CEO conservativeness can reduce the likelihood of AI adoption. Using a sample of politically neutral

S&P 1500 companies in the U.S. between 2010 and 2018, we find that conservative CEOs are significantly less likely to adopt AI. Conservative CEOs' aversion to AI is reinforced by their risk exposure, and mitigated by exposure to actual risk information in the environment. The effect of CEO political ideology on corporate AI adoption appears to be mediated through the appointment of conservative CTOs, the top managers most directly involved with firms' technology related strategies and adoption decisions. The results provide strong empirical support for the influence of CEO political ideology on firm AI adoption, a complex, risky, and increasigly politicized technology adoption decision, and for the moderating effects of CEO risk exposure and AI risk information.

This paper contributes to research on upper echelons, AI, and innovation. A major contribution of this study is to show how CEO political ideology values shape firms' decision to adopt and integrate AI within the organization and relevant moderators of this relationship. Our study shows that conservative CEOs adopt and integrate less AI through recruitment, due to their values emphasizing stability over risk. Confirming this argument, we find that CEOs' AI aversion is reinforced by their risk exposure, while it is mitigated by their exposure to actual risk information of AI. Another contribution of this paper is to show that CEO values remain influential in a group of politically neutral firms, after controlling for observable differences in TMT, board, industry and state political climate. Our theory and findings add to the upper echelons literature by demonstrating the role of CEO political ideology values in strategic decision-making over complex technologies.

This paper also contributes to the AI literature by exploring human values as key antecedents to AI adoption. The extant AI literature focuses on knowledge, capabilities and resources as major antecedents to AI adoption (e.g. Furman & Teodoridis, 2020; Jia, Luo, Fang,

& Liao, 2024). Yet, the cognition and values of decision makers have emerged as an important perspective for technology adoption in the age of AI and big data (Adner, Puranam, & Zhu, 2019; Bailey, Faraj, Hinds, Leonardi, & von Krogh, 2022; Faraj & Leonardi, 2022). This paper draws on upper echelons theory to interpret decision-making over AI adoption, and shows that CEO values substantially explain the variation of AI adoption among S&P 1500 firms. These findings suggest that CEO political ideology values are an important, hitherto unexamined, determinant of firms' AI strategy.

Our study also contributes to the broader literature on technology adoption and the factors that drive firms' adoption of new technologies. Prior literature shows that firms may slow down technology adoption in cases where there is poor fit with capabilities (Christensen, 1997), agency problems (Balsmeier, Fleming, & Manso, 2017; Bernstein, 2015), or monopolistic interests (Cunningham, Ederer, & Ma, 2021). Yet, a common underlying assumption has been that decision makers and relevant new technology can be viewed as politically neutral. This paper brings in a behavioral perspective to technology adoption, showing how CEO political ideology influences the adoption of new technology. Our theory and findings suggest that technology adoption is indeed significantly shaped by political values.

THEORY AND HYPOTHESES

Technology Adoption as a Risky, Political Choice

While technologies might be seen as "neutral" in design (Wiener, 1948; Peters, 2010) and economic essence (Smith, 1776; Schumpeter, 1942), the inevitable societal impact and change that technology adoption brings about could and often are perceived as risky and fundamentally political in nature, reshaping the state of human power and control (Wiener, 1950; Zuboff, 1988,

2019). New technologies can reshape the distribution of power within or across organizations, by changing the structure of control and the vulnerability of the system.

Adoption of new technologies is usually a progressive process, which can unevenly increase the power of certain groups adopting it by increasing the productivity, complexity, and specialization of their work. For example, Information technology (IT) systems may decentralize information distribution in organizations, reduce the power of managers, enhance the power of knowledge workers, and flatten the control hierarchy (Brynjolfsson, 1994). The increased complexity, difficulty, and specialization of work brought about by new technologies make it considerably more difficult to ensure stringent quality and risk control. For instance, before the adoption of electrical machines in repairing factories, broken devices were randomly assigned to workers who had the same set of tools, and the workers were graded by the rate of successful repairs. After adopting electrical machines, workers with less experience were assigned to work with the machine on "easy" cases, while workers with more experience were assigned to tackle "tricky" cases. Spotting the error and finding the individual responsible for that error become quite difficult (Sainsaulieu, 1971), because workers were working on different conditions with different objects. The varying complexity, difficulty and specialization of work make the division of labor and quality control more complicated, and change the power distribution within organizations.

The increased reliance on technology and few experts can also increase systematic vulnerability. When firms adapt from mechanical machines to electrical machines, the level of sensitive operation and skill requirements heightened greatly. Thus, a poorly run machine or one in poor condition exposes the organization as a whole to more risks. When firms adopt IT systems, overspecialization based on bulk information may contribute to tunnel vision and peripheral blindness (Van Alstyne & Brynjolfsson, 1996), which intensifies risks of misinformed decisions.

Prior studies also find that IT capital investments are improportionately more risky than non-IT capital investments (Dewan, Shi, & Gurbaxani, 2007). When firms adopt AI systems, increasingly complicated data and algorithms may embed privacy, opacity, and bias issues in deep layers, which may entail managerial and ethical breakdowns (Choudhury, Starr & Agarwal, 2020; Lambrecht & Tucker, 2019).

Key decision makers, including political and corporate elites, need to pivot through the above mentioned changes and risks to embrace new technology and progress (Zuboff, 1988, 2019). For instance, President Kennedy addressed the Anniversary Convocation of the National Academy of Science in 1963: " I can imagine no period in the long history of the world where it would be more exciting and rewarding than in the field today of scientific exploration. I recognize with each door that we unlock we see perhaps 10 doors that we never dreamed existed and, therefore, we have to keep working forward." Steve Jobs, cofounder of Apple, offers another example through his famous line at the Apple WWDC conference in 2007: "Let's go and invent tomorrow rather than worrying about yesterday."

Yet, just because key decision-makers are pivotal in embracing new technologies does not mean that they are always successful in achieving the stated goal of progress. The investment in new technologies can easily go to waste. Even if the investment is successful, it may open a Pandora's box of unintended consequences. It may also seem suspicious to stakeholders, especially investors and customers, when a firm invests large amounts money to build a "stupid AI chatbot" (Bridle, 2023). In case of successful technology development, the huge power of the new technology being adopted can pose huge risks to the focal firm and society at large. For instance, nuclear technology brought with it threats of nuclear war and the aftermath of nuclear plant leakages - pressing concerns that everyone worldwide has to face (Brumfiel and Lonsdorf, 2023;

Soldatkin and Osborn, 2024). Thus, complex decisions involving powerful new technologies imply value tradeoffs.

Political Ideology as a Driver of Upper Echelon Strategic Choices

Upper echelons theory has become a powerful lens through which to explain the strategic choices and performance levels of firms (Hambrick & Mason, 1984; Hambrick & Wowak, 2019). Top managers are powerful actors who bring in their values and cognitive preferences to bear onto complex decisions (Cyert & March, 1963; March & Simon, 1958), rather than pure "homines economici" who engage in the rational optimization of a firm's objective function based solely on techno-economic factors. When confronted with organizational and environmental stimuli, top managers rely on their cognition and values to filter the vast information, form perceptions, and decide on strategic choices. Values could also directly influence strategic choices since they include principles for "ordering consequences or alternatives" (Hambrick & Mason, 1984: 195). In other words, values are normative (Tedin, 1987). Top managers go through a normative, cognitive process when making decisions on complex and value-laden problems (Armstrong, Goodman, & Wagner, 1978; Gupta & Wowak, 2017b: 9).

A values-based perspective of political ideology conceptualizes such information filtering and ordering patterns as stable individual differences among elites (Hibbing, Smith, & Alford, 2014). First, the values associated with the spectrum of political ideology are fairly stable over time across different societies (e.g. Chin et al., 2013; Marquis & Qiao, 2020). Second, ideology as a set of values is most observable on the individual level. Changes in ideology typically happen in rare settings such as attendence in military academies (Garnier, 1972). Importantly, corporate elites engage in political activities as manifestations of their individual political ideologies (e.g., Tetlock, 2000; Burris, 2001; Francia et al., 2005). Third, the liberal-conservative spectrum captures more

acurately the political ideology of elites than that of the public at large (Converse, 1964). Thus, political ideology as a set of values influences the ways a CEO filters and processes information, evaluates materialistic interests or constraints, socializes within the organization, and makes business decisions.

Political ideology is defined as a set of interrelated values (Tedin, 1987: 65), or as belief systems (Converse, 1964) about the "proper" goals of society and how they "should" be achieved. Political ideology can be characterized in different ways, among which the liberal-conservative spectrum has been identified (e.g. Schwartz, 1996; Jost, 2005) and leveraged by management scholars (Chin et al., 2013; Chin & Semadeni, 2017; Gupta et al., 2017; Gupta & Wowak, 2017) as the most significant for understanding central values related to political ideology. At the very core of the liberal-conservative continuum is a different preference ordering for change and risk (liberalism), on the one hand, versus tradition and stability (conservatism), on the other.

Change versus stability in TMT decisions. CEOs with conservative values may lead firms into strategies aligned with tradition and stability while avoiding change and risk. Liberal leaders are more recptive to change and risks, while conservative leaders are more recepive to tradition and stability (Jost, 2006; Schwartz, 1996). For instance, extant research has found liberal top managers to be more receptive to activist groups and their proposals (Neville & Gamache, 2018), whereas conservative ones have been found to be more likely to use impression management tactics to avoid taking a stand on controversial topics (Gupta & Briscoe, 2019). Likewise, liberal partners in large law offices are more likely to hire and promote female associates (Carnahan & Greenwood, 2018), whereas conservative leaders are more likely to hire and promote male subordinates (Briscoe & Joshi, 2017) because they are assumed to be the less risky choice in a professional setting (Nair, Gupta, & Wowak, 2018). Moreover, liberal CEOs are more likely to

opt for changes that favor collective decision making (Simsek et al., 2005) and put a greater emphasis on and attention to secondary stakeholders such as customers and the government (Agle, Mitchell, & Sonnenfeld, 1999). In contrast, conservative top managers and directors are more likely to prefer "lone-insider structures", i.e., models of governance that place greater power and responsiblity in the hands of a few leaders at the top (Gupta, Wowak, & Boeker, 2017).

Change versus stability in financial decisions. Liberal CEOs tend to take more risky strategies of corporate tax avoidance than conservative CEOs (Christensen et al., 2015), while conservative CEOs tend to restructure an organization by traditionally less risky strategies, such as downsizing (Gupta et al., 2019).

Change versus stability in technological decisions. Liberal leaders in general value open science and technology advancement. For example, the leaders of the Computerization movement embraced the ideology of open science, and encouraged technology diffusion (Barrett, 2013). Thus, in 1985, Richard Stallman developed the principle of "copyleft", i.e., the inverse of "copyright", which quickly became popular among computer scientists. At the core of the concept of "copyleft" was the idea that the authors give others permission to change the software and add to it. Likewise, decision makers' liberal ideology of openness to change and risk drove the adoption of the Internet of Things within a traditional oil and gas operator (Monteiro & Parmiggiani, 2019). Conversely, CEOs concerned with risks tend not to have aggressive technology policies (Lefebvre & Mason, 1997).

The Effect of CEO Political Ideology on AI Adoption

Given the well established link between CEO conservativeness, on the one hand, and an increased preference for stability as well as aversion to risks, on the other (Gupta & Briscoe, 2019; Nair, Gupta, & Wowak, 2018), we expect conservative CEOs to be more concerned about the potential

risks embedded in AI systems. Thus, due to greater concerns about AI-related risks and unanticipated or undesirable AI-induced changes, a more conservative CEO should be less likely to favor adopting and integrating AI functions within the firm relative to a more liberal CEO. While AI has the potential to expand productivity, spur creativity of human workers, and improve service quality, we believe that top managers judge AI based on their core values.

AI investment might put the firm and the decision-maker responsible for the adoption at risk. Trade secrets are at risk when exchanging information with the AI system. For example, Large Language Models such as ChatGPT may be smart enough to reverse engineer ongoing research and development projects of other firms based on the questions that engineers from those firms ask it in order to fix a bug in their code or development process. Thus, leading high-tech firms like Apple and Amazon have banned the usage of ChatGPT among employees (Mok, 2023). Moreover, vulnerability and potential breakdowns of the AI system might damage a firm's reputation and consumer trust (Hou & Poliquin, 2023). Improper handling of algorithms and data might also draw punishment from regulators. For example, Meta, the parent firm of Instagram and WhatsApp was fined €1.2 billion by EU regulators for inadequate transfer of user data and failure to comply with the General Data Protection Regulation (GDPR) (European Data Protection Board, 2023).

The risks of suffering from the loss of trade secrets, customers, money, and legitimacy may reduce the likelihood that conservative CEOs adopt or integrate AI into the firm. Conservative CEOs differ from liberal CEOs in their core value of ordering stability and tradition before risk and change, as characterized by the liberal-conservative spectrum. These core values frame the information filtration and cognition, evaluations of materialistic interests and constraints, as well as socializations of CEOs. Conservative CEOs are more likely to filter out information on risky

strategic choices, and focus on traditional or stable choices. Information about both the benefits and downsides of the risky choices may be discounted. Thus, choices perceived as more risky may appear murky and suspicious to conservative CEOs, even before fully assessing their actual risk (Kahan, Peters, Dawson, & Slovic, 2013; Kunda, 1990). In situations where conservative CEOs do consider and include in their evaluation set those risky choices, they may still order the more stable choices first due to their value preferences for tradition and stability. Thus, conservative CEOs may be less likely to consider AI adoption as a streightforward strategic choice that leads to greater corporate and societal progress/performance/well-being compared to liberal CEOs.

Political ideology is also a strong force behind the connection of the individual to others, both in the organization and in society at large, which can facilitate resource mobilization (Warriner, 1961). Conservative CEOs tend to select stable strategic choices over risky ones, which aligns with their their values and self interests as well as fits with potential materialistic constraints constructed in the past (Chin et al., 2013; Mannheim, 1936), such as the appointment of conservative CTOs (see Appendix A). Being seen as adopting and integrating AI in a risky, less conservative way might harm conservative CEOs by making their stance questionable to relevant audiences and impairing their ability to benefit from existing connections with other conservative actors.

In sum, conservative CEOs are more likely to value stability over risk in their perception and evaluation of AI. Thus, conservative CEOs whose values favor stability would be more likely to temper or filter out choices of risky and political technologies, rate the viability of such strategies less favorably, and impose materialistic constraints on adoption, reducing the likelihood that conservative CEOs adopt or integrate AI into the firm compared to liberal CEOs.

> *Hypothesis 1. Conservative CEOs are less likely to integrate AI into the firm compared to liberal CEOs.*

The moderating effect of CEO risk exposure. Managers across the organizational hierarchy, including CEOs, top executives, and middle managers, tend to exhibit myopia (Chakravarty & Grewal, 2011; Miller, 2002). They can be self-interest driven actors primarily focused on short-term rather than long-term outcomes. Studies have explored conditions under which managers can overcome their short-term orientation/myopia, such as in family business settings (Kang & Kim, 2020). We argue that top managers, especially CEOs, may also look to the long term when making complex decisions based on their political ideology, i.e. the set of interrelated values about ideal goals of the society and the proper path to achieve it.

Decision-making over complex cases based on ideology reflects the future orientation of the decision-maker. Judges in the Supreme Court make decisions based on their ideology in order to influence legal change over time (Epstein, Landes, & Posner, 2011; Solomon & Hall, 2023). Political leaders in different countries make decisions based on their ideology in order to influence societal changes, entrepreneurship development, and wealth distribution over time (Bennett, Boudreaux, & Nikolaev, 2023). Top managers make decisions based on their ideology in order to influence social (Chin et al., 2013; Hafenbrädl & Waeger, 2017), financial (Marquis & Qiao, 2020), and environmental changes over time (Slater & Dixon-Fowler, 2010).

Political ideology is not only a description or interpretation of the world, but also a channel for managerial action onto the world. Under this view, managers are rational agents of change, who are responsible for the future (Carlisle & Manning, 1994; Jost, Federico, & Napier, 2009). The future could be risky and threatening for the present as depicted by conservative actors, or it could be open to opportunities and reconstruction of realities as envisioned by liberal actors. Different ideologies can influence individual actions through a normative optimization strategy, where the decision-maker starts from the premise of existing commitments, continue to sustain the

conditions and obligations, as well as to preclude the options which are incompatible with the set of values. This normative optimization strategy shares features with arithmetic reasoning as a rule-following procedure (Sidgwick, 1974).

We argue that if conservative CEOs get exposed to more risks and perceive the future as risky, they could be less likely to adopt or integrate AI within the firm. CEOs that get more risk exposure would recommend social stability through mantaining a lag between technological changes and their implementation in the firm. This lag will sustain until the social consensus around the risky political new technology emerges, when corporate elites adapt their decisions to the new status quo. Petit (1961) pointed that: "If management were to become the architect of social progress the economy would engulf the society." Thus, we argue that risk exposure echoes with conservative CEOs' values towards stability, and reinforces their aversion to AI as a risky political new technology without social consensus.

> *Hypothesis 2. Conservative CEOs' aversion to AI is reinforced when they have more risk exposure.*

The moderating effect of exposure to risk information. Conservative CEOs make decisions around AI adoption based on their perceptions of the risks and predictions of the consequences. The perceived risks and predicted consequences are not necessarily based on the real probability distribution of potential outcomes. In business reality, information about the actual risk associated with a specific strategic choice is usually lacking. This ubiquitous situation is called "Knightian uncertainty" (Knight, 1921), which constitutes the core issue confronted by decision makers (Coase, 1937; Keynes, 1937). The unpredictable consequences of adopting complex new technologies (Dewan et al., 2007) such as IT and AI systems, as well as the lack of a shared view on the consequences, could pose challenges to decision makers.

The unpredictable consequences of technologies could be puzzling to experts as well, postponing adoption by a hundred years. For example, steam engines emerged around 1700s, and were improved by James Watt to be applied to industrial production. It is woth noting that Watt only used low-pressure steam. High-pressure steam (i.e. above atmospheric pressure) could have allowed for stronger power within a smaller space, replacing horse power and enabling faster and lighter cars. But Watt was deeply concerned about the unacceptable risks of explosion (Burke, 1966). So he patented the idea in order to prevent the dangerous idea from realization. Soon after his patent expired, high-pressure steam engines were introduced in cars, trains, and boats. In a similar logic, Thomas Edison campaigned against the use of high-voltage electricity due to its complexity and unpredictable consequences to public safety (Josephson, 1992). The successful application of these complex and risky technologies was based on actual risk information accumulated through industrial practice.

We argue that access to actual risk information on AI may facilitate decision-making concerning AI adoption. Scholars have long recognized that scarse information hampers decision making, and exposure to some information about the proflie of new technologies can enable better decisions (Simon, 1996). The diffusion of relevant information could turn uncertainty into risk which managers might act upon (March, 1994: 179). Information on social reference points may encourage risk-taking by dimishing decision makers' sensitivity to risk (Schwerter, 2024). Information on the financial market may facilitate risk-taking by increasing investors' confidence in the market (Lau, Ng, & Zhang, 2012). New information from the emvironment may encourage entrepreneurs to mitigate environmental uncertainty and take proactive actions (Hunt & Song, 2015; Packard, Clark, & Klein, 2017). Similarly, we theorize that conservative CEOs with exposure to AI risk / failure information in the environment are more likely to act upon such

information to find the suitable path to AI adoption. Thus, we argue that exposure to the risk information about AI-related risks in the environment may mitigate conservative CEOs' sensitivity to AI risks and increase their confidence in the adoption and integration of AI within the firm.

> *Hypothesis 3. Conservative CEOs' aversion to AI integration is mitigated when they have more exposure to actual AI risk information.*

METHODS

Context and Sample

Political ideology is an increasingly important factor for team formation and decision making in big U.S. firms. Corporate elites in S&P 1500 firms have become more polarized with their ideologies in the past decade. Study shows that the reason behind this trend is 61 percent due to the matching between elites and firms sharing similar political ideology, and 39 percent due to the political homogenization of the elite population (Fos, Kempf, & Tsoutsoura, 2023). Incongruence in political ideology also leads to board director departure (Busenbark, Bundy, & Chin, 2023). Thus, CEO political ideology is an important and endogenous factor for complex decision making in big U.S. firms.

To test our hypotheses, we examine the influence of S&P 1500 CEO political ideology on AI adoption decisions. To overcome the endogeneity between CEO political ideology and unobservable firm characters, we collect data on political ideology of corporate elites between 1999 to 2009, and specify a sample of politically neutral S&P 1500 firms at the start of 2010, for which the selection of CEOs with political leaning is more likely to be caused by external population changes rather than internal reasons. We also use the data from 1999 to 2009 to construct instrumental variables for CEO political ideology, including: past political ideology of TMT and board members of the firm, as well as political ideology of politicians in the state of firm

headquarters and federal government. These lagged factors are highly related to CEO ideology, but not directly associated with the AI adoption decision.

We build the CEO, TMT, and board political ideology data on the updated Database on Ideology, Money in Politics, and Elections (DIME), which covers over 300 million political contributions made by both individuals and organizations to U.S. elections from 1979 to 2018 (Bonica, 2023). We adopt the measure of individual political ideology based on political contributions from the DIME, and match this data with S&P 1500 CEO, TMT, and board information from the ExecuComp and BoardEx through a two-step fuzzy matching process. First, we use the first name, middle name, last name, age, and institution affiliation of corporate elites to sort a list of potential matches via the Stata fuzzy matching function *reclink2*. Second, we manually checked the list to decide on the final match. After this matching, we have the political ideology of S&P 1500 CEOs, TMT, and board members from 1999 to 2018. We use the ten-year period from 1999 to 2009 to estimate the long-term political ideology of the firm and the political climate in the headquarters state. Our main analysis is performed using data from 2010 to 2018.

AI adoption and integration data come from Burning Glass Technologies (BGT) online job postings which covers all U.S. jobs posted online from 2010 to 2020. We first match the firm identifiers in BGT to the standardized firm identifier *gvkey* of U.S. public firms in Compustat based on matching tables in prior research (Babina, Fedyk, He, & Hodson, 2024). For each public firm, we identify all job postings involving AI related keywords[1]. Then, we calculate the total number of AI related jobs for each firm in each year.

Other data on firm financial fundamentals, TMT and board characteristics are collected from Compustat, ExecuComp and BoardEx. The data on CEO future orientation is based on prior

[1] We use the following keywords which have appeared in prior studies: Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), Decision Trees.

research on CEO sensitivity to stock option market fluctuations (Agarwal, Vashishtha, & Venkatachalam, 2018; Core & Guay, 2002). The sensitivity of CEO wealth to stock prices is calculated as the increase in value of the CEO's stock- and option-based portfolio for a 1 percent increase in stock price, using CEO identities and stock and option holdings from the Equilar database. We collected actual risk information of data breaches from Privacy Rights Clearinghouse, which is a nonprofit organization focused on increasing access to information about data privacy. Starting from 1992, they maintain a comprehensive list of reported data breach events in the U.S. from 2005 to 2021. We matched this data to the sample of S&P 1500 firms and caculated the industry exposure to risk information on the three-digit SIC code level.

After merging the data, we reach a sample of politically neutral S&P 1500 firms from 2010 to 2018, ending up with 6,702 firm-year observations. We find a similar pattern compared to prior studies (Figure 1), showing that the conservativeness of CEOs in politically neutral S&P 1500 firms has been steadily increasing since 1999 (Fos et al., 2023).

*** Figure 1 about here ***

Key Variables

AI integration is the main dependent variable we examine. It is measured as (log) new job postings requiring skills in AI related domains, such as ML and NLP (Acemoglu, Autor, Hazell, & Restrepo, 2022; Alekseeva, Azar, Giné, Samila, & Taska, 2021; Goldfarb, Taska, & Teodoridis, 2023). Previous scholars have shown that this data is representative of the U.S. labor market (Babina et al., 2024). So that this variable can capture the level of AI integration of each firm as well as the heterogeneity among different firms. This measure mainly captures the type of technology adoption via internal recruiting, rather than outsourcing.

CEO and CTO conservativeness are inferred from corporate elites' political contributions to local, state, and federal government elections every two years. Bonica (2014) uses a spatial model to estimate individual contributors' ideology based on the portfolio of politicians they contribute to. The estimation result is standardized as a score ranging from -2 to 2, representing extreme liberal to extreme conservative political ideology. This measure has been validated against several other measures and has shown high reliability (Bonica, 2018).

CEO risk exposure is measured as CEO sensitivity to market fluctuations, based on their stock and options portfolio. It is calculated as the change in value of the CEO's investment portfolio for a 1 percent change in the stock price of their firm (Agarwal et al., 2018; Core & Guay, 2002). CEO stock and options ownership is widely adopted among S&P 1500 firms as an incentive structure (Brisley, Cai, & Nguyen, 2021). Unlike the measures capturing *past* financial situation and information, such as CEO stock holdings and firm perfromance, the CEO risk exposure measure captures CEO orientation to *future* riskiness. CEOs with higher sensitivity to market fluctuations have stronger risk exposure, which interacts with their internal values about the future.

Exposure to actual risk information is measured as the (log) data breach event count for each year in the industry the focal firm operates in (Schatz & Bashroush, 2016). These events lead to unintended exposure of personal data via hacking, fraud, physical loss of documents, computer system glitches, or unknown channels. Such data breach events reveal actual risks, especially privacy and opacity concerns, of investing in AI systems to leverage data-driven learning capabilities.

We include control variables at the CEO level, the TMT level, the board level, the firm level and the industry level. At CEO level, we control for power (dual CFO or board position), vested stock options, stock ownership, gender, and tenure. At TMT level, we control for age

diversity, gender diversity, and the diversity of functional areas. At board level, we control for average age of directors, average tenure, board size, gender diversity, and nationality mix ratio. At firm level, we control for RoA, employee count, slack resources, R&D intensity and sales. At industry level, we control for the competition intensity.

RESULTS

Table 1 reports descriptive statistics for all variables. CEO tenure and CEO stock ownership are correlated with CEO risk exposure. This is consistent with our argument that CEO risk exposure reflects past interest dispositions. Female CEO is correlated with gender diversity in TMT, which confirms prior studies in upper echelons literature (Briscoe & Joshi, 2017; Carnahan & Greenwood, 2018). Firm size is correlated with sales.

*** Table 1 about here ***

Table 2 reports the results of our hypothesis testing. Model 1 shows the 2SLS estimation of CEO conservativeness on AI integration via internal recruitment. The coefficient on the independent variable "CEO conservativeness" shows the negative effect of CEO conservativeness on AI integration in politically neutral S&P 1500 firms (β: -0.453; $p < .05$). This estimation accounts for matching between CEOs and the firm due to observable ideology factors as well as unobservable factors. Compared to moderately liberal CEOs, moderately conservative CEOs integrate AI via internal recruitment 90 percent less. This model supports Hypothesis 1. What's more, Figure 2 shows more straightforward time trends in AI adoption by conservative and liberal CEOs. Conservative CEO remain skeptical of AI adoption, while liberal gradually increase AI adoption from 2010 to 2018.

*** Figure 2 about here ***

Looking into potential mechanisms of CEO conservativeness, Model 2 shows the influence of CEO risk exposure on the relationship between CEO conservativeness and AI integration. The coefficient on the independent variable "CEO conservativess" shows the positive effect of CEO conservativeness on AI integration when there is no risk exposure (β: 6.854; $p < .10$). The coefficient on the two-way interaction term "CEO Conservativeness × CEO Risk Exposure" shows the negative effect of CEO conservativeness on AI integration when there is strong risk exposure (β: -1.421; $p < .10$). The coefficient on the moderator "CEO Risk Exposure" shows the negative effect of CEO risk exposure on AI integration when the focal CEO is politically neutral (β: -1.044; $p < .05$). These results show that the negative influence of CEO conservativeness on AI integration is substantially reinforced by CEO risk exposure. These results support Hypothesis 2.

Model 3 shows the influence of actual risk information in the environment on the relationship between CEO conservativeness and AI integration. The coefficient on the independent variable "CEO conservativess" shows the negative effect of CEO conservativeness on AI integration when there is no actual risk information in the environment (β: -4.015; $p < .05$). The coefficient on the two-way interaction term "CEO Conservativeness × Exposure to actual risk information" shows the positive effect of CEO conservativeness on AI integration when there is strong exposure to actual risk information about AI (β: 2.186; $p < .10$). The coefficient on the moderator "Exposure to actual risk information" is omitted due to firm and year fixed effects. These results show that the negactive influence of CEO conservativeness on AI integration is

significantly mitigated by exposure to actual risk information about AI. These results support Hypothesis 3.

Model 4 shows the influence of CEO risk exposure on the relationship between CEO conservativeness and AI integration in the environment with low exposure to actual risk information about AI. The coefficient on the independent variable "CEO conservativess" shows the positive effect of CEO conservativeness on AI integration when there is no risk exposure (β: 3.861; $p < .05$). The coefficient on the two-way interaction term "CEO Conservativeness × CEO Risk Exposure" shows the negative effect of CEO conservativeness on AI integration when the CEO has great risk exposure (β: -0.758; $p < .01$). The coefficient on the moderator "CEO Risk Exposure" shows the negative effect of CEO risk exposure on AI integration when the focal CEO is politically neutral (β: -0.846; $p < .01$). These results show that the negative influence of CEO conservativeness on AI integration is substantially reinforced by CEO risk exposure. These results show that the moderating effect of CEO risk exposure is strengthened in low risk information environment, supporting Hypothesis 2 and 3.

*** Table 2 about here ***

Additional Analysis

To strengthen the main effect described in Hypothesis 1, we also look into the appointment of conservative CTOs as a mediator between CEO conservativeness and AI adoption. In addition to being an individual lens of decision-making, ideology also molds the socialization of CEOs, thus shaping the shared vision of the top managers relevant to the crucial and complex decision, such as CTOs. We predict that conservative CEOs are more likely to appoint conservative CTOs, who carry on their aversion to AI adoption. This prediction echoes prior studies on CEO value

alignment with the board of directors and other top managers (e.g. Gupta & Wowak, 2017; Hambrick & Wowak, 2019).

Model 5 (see Appendix A, Table A.1) shows the estimation of CEO conservativeness on CTO conservativeness. The coefficient on the independent variable "CEO conservativeness" shows the positive effect of CEO conservativeness on CTO conservativeness in politically neutral S&P 1500 firms (β: 0.101; $p < .10$). Compared to moderately liberal CEOs, moderately conservative CEOs tend to appoint CTOs with 0.2 more conservativeness. Model 6 then shows the estimation of CTO conservativeness on AI integration via internal recruitment. The coefficient on the independent variable "CTO conservativeness" shows the negative effect of CTO conservativeness on AI integration in politically neutral S&P 1500 firms (β: -5.088; $p < .10$). Therefore, compared to moderately liberal CEOs, moderately conservative CEOs decrease AI integration by 95 percent via the appointment of conservative CTOs. These two models provide further support for Hypothesis 1.

To rule out alternative explanations that CEO political ideology is not the key driving factor behind AI integration, we also run two robustness tests. First, we show that the political ideologies of other important decision makers, including CTO and CFO, do not influence AI integration (see Appendix A, Table A.2). This finding reduces the chances that unobservable interactions of corporate elites' values confound the influence of CEO values on AI integration. We show that CEO political ideology is the only significant factor at play. Second, we distinguish "AI-using" firms from "AI-producing" firms (Acemoglu et al., 2022: S295), and run the analysis only on AI-using firms (see Appendix A, Table A.3). The main hypotheses remain supported. The results how that our findings are not biased by AI-producing firms that play a leading role in the diffusion of

AI technology. Rather, our results are representative and generalizable for the vast majority of AI-using firms.

DISCUSSION

Powerful new technologies can be a major source of competitive advantage (Barney, 2001; Eisenhardt & Martin, 2000; Grant, 1996; Teece, Pisano, & Shuen, 1997). A common implicit assumption of many strategic management theories has been that the underlying mechanisms of technology are value-neutral (Schumpeter, 1942; Smith, 1776) and, thus, technology adoption is determined by factors such as firm knowledge/experience, resources and capabilities. This assumption also influences how technology and innovation management scholars theorize and operationalize technology, which usually leaves out the political and risky nature of new technologies (Aral, Brynjolfsson, & Wu, 2012; Cassiman & Veugelers, 2006; Lerner & Seru, 2022; McElheran, 2015; Wu, Hitt, & Lou, 2020).

Yet, the conceptualization of technology as politically neutral may limit scholars' abilities to fully explain the nature and mechanisms of technology adoption, especially in today's age of AI and big data (Adner et al., 2019; Bailey et al., 2022; Faraj & Leonardi, 2022). Compared to previous technological advancement, AI has been more pervasive in tranforming the distribution of control and power within and across organizations. The ever-evolving nature of powerful AI systems gives rise to unprecedented privacy, opacity, explainability, accountability, and bias issues in increasingly complicated data and algorithms (Choudhury, Starr, & Agarwal, 2020; Lambrecht & Tucker, 2019), which can result in managerial and ethical breakdowns.

This paper shows that corporate AI adoption is indeed a risky and political strategic choice and CEO political ideology is a key determinant thereof. We argue and find that conservative CEOs are significantly less likely to adopt AI. Reinforcing this argument, conservative CEOs' AI

aversion is significantly strengthened by their risk exposure, and substantially weakened by exposure to actual risk information about AI. Conservative CEOs' AI aversion appears to be mediated through the appointment of conservative CTOs, who can directly traslate their CEOs' political ideology driven value preferences into execution.

Contributions

***Research on upper echelons*.** The upper echelons literature studies how corporate elites' cognition and values shape strategic decision making (Hambrick and Mason, 1984; Hambrick, 2007; Bromiley and Rau, 2016). Prior literature primarily focuses on TMT and financial decisions (Chin, Hambrick, and Treviño, 2013; Gupta, Nadkarni, and Mariam, 2019). There is more limited understanding of how and why CEO values shape technological decisions, except one study about the adoption of scanning machines (Lefebvre & Mason, 1997). Existing findings only provide correlational evidence of self-reported values of managers in a single case setting, without evidence about the mechanisms that connect values to technology adoption decision, or the generalizability of the findings.

Our study adds to the upper echelons literature by showing the large-scale effect of CEO political ideology on technological adoption decisions in S&P 1500 firms. We find that moderately conservative CEOs adopt and integrate 90 percent less AI compared to moderately liberal CEOs. The CEO aversion to AI adoption is reinforced by CEOs' risk exposure. These findings show the substantial influence of CEO political ideology on technology decisions, expanding the explanatory power of upper echelons theory from TMT and financial decisions into technology decisions. Our study invites future research to apply the upper echelons lens for technology adoption decisions and shed light on the theorization of technologies in organizations.

We show that CEOs' aversion to technology adoption is mitigated by their exposure to actual risk information about that technology in the environment. If values do play a role as bias or preference in technology adoption decisions, exposure to actual risk information would have no—or even negative—influence on technology adoption. Without CEOs' future orientation and normative reasoning at play, conservative ideology should impose a cognitive barrier for CEOs to process the risk information in the environment. However, our results suggest that CEOs' future orientation and normative reasoning based on values help mitigate the potential cognitive barriers that would otherwise accompany a conservative political ideology. Conservative CEOs *increase* AI adoption when they get exposed to actual risk information about AI in the environment. Our findings have important implications for stakeholders and TMT members, showing that technology adoption decisions engage normative reasoning based on values of corporate elites. These findings add to the upper echelons literature by demonstrating the role of CEO values in strategic decision-making over complex technologies.

Research on AI. The current AI literature have examined the influences of firm resources and capabilities, such as technical knowledge (Lou & Wu, 2021), human expertise (Jia et al., 2024; Lou & Wu, 2021), and technological tools (Wu, Lou, and Hitt, 2019; Furman and Teodoridis, 2020; Wu, Hitt, and Lou, 2020) on the diffusion of AI. They theorize AI adoption as a politically neutral strategic choice, which should be a function of the economic cost and benefit. However, there is increasing consensus among scholars that complex and ever-evolving technologies involve far more factors than individual economic considerations (Adner et al., 2019; Bailey et al., 2022; Faraj & Leonardi, 2022).

This paper looks into human values − characterized by political ideology − as an important antecedent to AI adoption. It is not merely a question of whether the firm "could" adopt AI, but

also a question whether the firm "should" adopt AI. We argue and show that CEO political ideology values about the proper goal of society and the way it should be achieved, have great explanatory power for the variation of AI adoption among big public firms. We invite future AI scholars to incorporate the values and political ideology lens into research on AI adoption and diffusion.

Research on technology adoption. It is widely acknowledged that technology advancement may lead to competitive advantages for the firm, as well as productivity and welfare gains for the society (Boussioux, N. Lane, Zhang, Jacimovic, & Lakhani, 2023; Schumpeter, 1942). Yet firms also have various reasons - including the poor fit of capabilities (Christensen, 1997), agency problems (Balsmeier et al., 2017; Bernstein, 2015), and monopolistic interests (Cunningham et al., 2021) − to downplay technology adoption both internally and externally. Prior studies view the technology as politically neutral, and consider decision makers as rational agents optimizing benefits in the face of market frictions. It is underexplored how decision makers face complex and political technology decisions with their cognition and values.

This paper brings in the cognitive and behavioral perspective to technology adoption, to show how CEO values complement capabilities, incentives, and monopolistic interests in shaping decisions around complex technologies. We find that conservative values may decrease innovation greatly in large public firms, after controlling for techno-economic factors from the technology adoption literature. This paper invites future research in technology adoption to look into cognitive and behavioral perspective to technology decisions, especially as generative AI technologies give us the illusion that human factors are becoming obsolete in innovation.

Conclusion

Just as high-pressure steam engines and high-voltage electricity managed to penetrate industrial production and modern life despite the skeptism of the very inventors of the technology,

AI diffusion holds a similar promise to permeate organizations and society at large in profound ways. Amidst the heated debates and societal concerns about AI, this study tries to shed some light on hitherto overlooked drivers of digital transformation and AI adoption. We show that firms need to take into acount not just techno-economic factors, such as knowledge, capabilities, and resources, but also human value factors, such as the political ideology of key decision makers. Viewing the adoption of new technology as an inherently risky and political choice that is affected by the political ideology values of key decision makers opens new avenues for a deeper understanding of AI adoption by scholars, practitioners, and/or regulators.

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FIGURE 1
Political Ideology of Corporate Elites in Politically Neutral S&P 1500 Firms

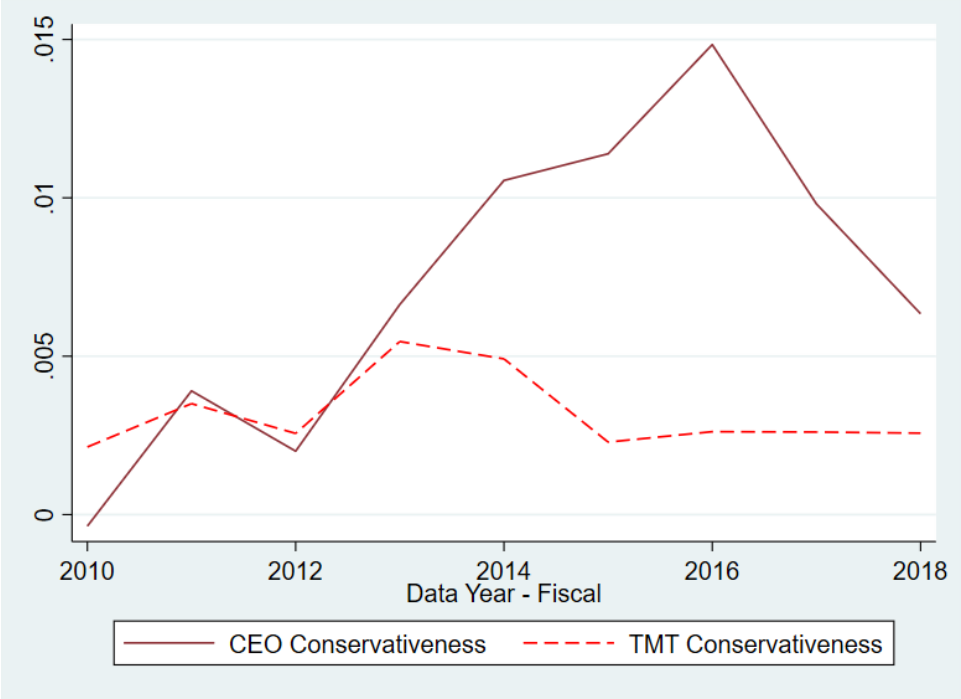

FIGURE 2
AI Adoption by Conservative and Liberal CEOs in Politically Neutral S&P 1500 Firms

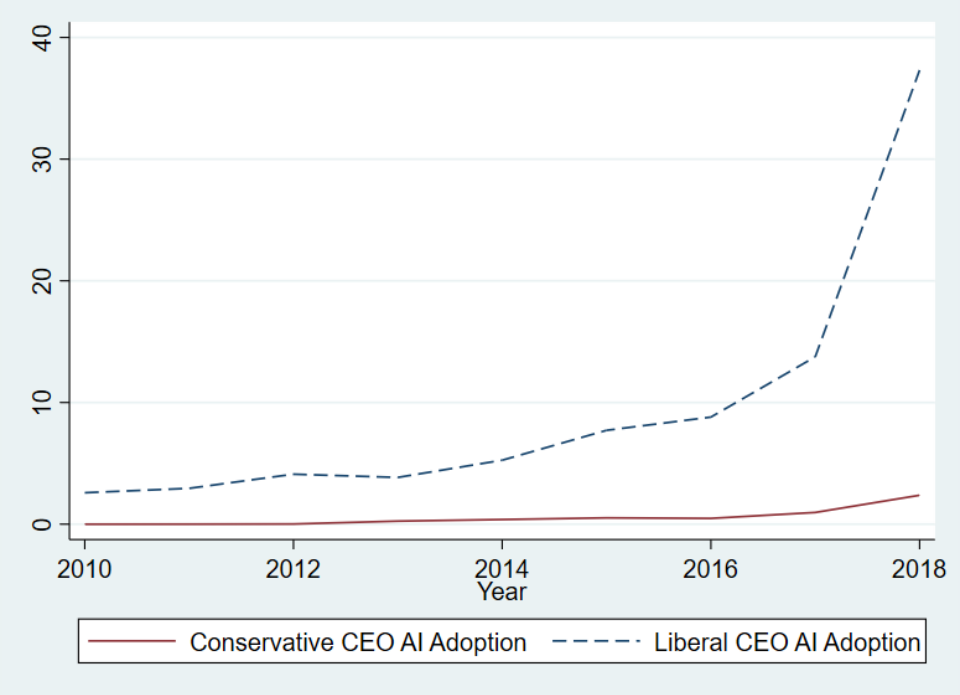

TABLE 1
Summary Statistics and Correlation Matrix[a]

	Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1	AI Integration	0.47	1.12													
2	CEO Conservativeness	0.01	0.31	-0.02												
3	CTO Conservativeness	-0.00	0.08	-0.04	0.07											
4	CEO Risk Exposure	5.02	1.63	**0.23**	-0.01	-0.01										
5	Exposure to Actual Risk Information	1.83	1.38	**0.11**	-0.02	-0.03	-0.00									
6	CEO Conservativeness × CEO Risk Exposure	-0.01	1.54	-0.03	**0.94**	0.10	-0.03	-0.02								
7	CEO Conservativeness × Exposure to Actual Risk Information	0.00	0.72	-0.01	**0.80**	0.06	-0.01	-0.00	**0.76**							
8	RoA	0.07	0.15	0.06	0.00	0.02	**0.27**	**-0.14**	0.00	0.03						
9	Firm Size	1.78	1.40	**0.45**	0.04	0.00	**0.37**	**-0.13**	0.04	0.07	**0.24**					
10	Slack Resources	0.26	0.75	-0.00	-0.06	-0.05	-0.07	**0.17**	-0.06	-0.06	**-0.33**	**-0.19**				
11	Sales	7.14	1.80	**0.44**	0.06	0.00	**0.40**	**-0.19**	0.06	0.08	**0.33**	**0.85**	**-0.30**			
12	R&D Intensity	0.03	0.09	-0.01	-0.09	-0.03	**-0.11**	**0.11**	-0.09	**-0.11**	**-0.41**	**-0.27**	**0.43**	**-0.35**		
13	Industry Competition Index	0.11	0.13	-0.04	0.04	0.00	0.01	**-0.12**	0.04	0.03	0.06	**0.13**	-0.04	0.08	-0.02	
14	Industry Competition Index Squared	0.03	0.08	-0.02	0.02	0.01	0.02	-0.04	0.02	0.01	0.08	**0.11**	-0.00	0.06	-0.03	**0.92**
15	CEO Power (Dual CFO)	0.01	0.10	-0.00	-0.04	0.00	-0.05	-0.01	-0.05	-0.02	-0.04	-0.04	0.06	-0.02	0.02	-0.02
16	CEO Power (Dual Board Director)	0.03	0.17	-0.02	-0.01	0.01	0.01	0.01	-0.00	-0.03	-0.00	-0.02	-0.02	-0.02	-0.00	0.03
17	CEO Gender (Female = 1)	0.04	0.20	**0.13**	-0.07	-0.01	-0.02	-0.04	-0.08	-0.04	0.08	**0.12**	-0.02	**0.11**	-0.04	0.02
18	CEO Stock Ownership	5.48	1.91	0.06	-0.01	-0.02	**0.62**	0.03	-0.03	-0.02	0.02	0.09	-0.01	**0.11**	-0.04	0.02
19	CEO Tenure	6.71	6.67	-0.07	-0.00	-0.02	**0.32**	0.05	-0.00	0.01	-0.01	-0.10	0.01	**-0.11**	0.02	-0.02
20	Board Average Age	62.90	4.77	-0.01	0.07	0.02	0.05	-0.05	0.07	0.08	-0.02	0.04	-0.08	0.08	-0.04	-0.03
21	Board Size	22.56	20.07	0.22	0.04	0.03	0.06	0.04	0.04	0.07	0.01	**0.30**	**-0.11**	**0.33**	**-0.13**	-0.05
22	Board Average Tenure	3.24	1.85	0.15	0.02	-0.01	**0.11**	-0.01	0.03	0.03	0.01	0.09	-0.00	0.10	-0.03	-0.03
23	Board Gender Diversity	0.15	0.12	**0.22**	0.02	0.02	0.10	-0.04	0.03	0.07	0.13	0.33	-0.07	**0.34**	-0.13	0.01
24	Board Nationality Mix Ratio	0.46	0.27	**-0.18**	-0.03	-0.01	**-0.18**	**0.08**	-0.02	-0.06	**-0.11**	-0.35	0.07	**-0.39**	0.07	0.02
25	TMT Age Diversity	6.09	3.00	-0.07	0.00	0.01	-0.06	0.02	0.01	-0.02	-0.02	-0.13	-0.03	**-0.12**	-0.03	-0.00
26	TMT Gender Diversity	0.10	0.13	**0.11**	-0.09	-0.02	-0.01	-0.01	-0.09	-0.07	0.10	0.06	-0.03	0.06	-0.08	0.08
27	TMT Blau Index	0.41	0.24	**-0.14**	-0.00	0.01	-0.04	-0.04	-0.01	-0.00	0.03	**-0.19**	0.04	**-0.19**	**0.12**	0.09

	Variables	14	15	16	17	18	19	20	21	22	23	24	25	26
15	CEO Power (Dual CFO)	-0.02												
16	CEO Power (Dual Board Director)	0.01	-0.01											
17	CEO Gender (Female = 1)	0.06	0.00	-0.01										
18	CEO Stock Ownership	0.00	-0.03	0.03	-0.05									
19	CEO Tenure	-0.03	-0.04	0.05	-0.07	**0.38**								
20	Board Average Age	-0.04	0.03	0.03	-0.04	0.09	**0.15**							
21	Board Size	-0.06	-0.02	-0.02	0.03	0.01	-0.08	0.10						
22	Board Average Tenure	-0.01	-0.05	-0.03	0.02	0.07	**0.15**	**0.32**	0.05					
23	Board Gender Diversity	0.02	-0.02	-0.04	**0.11**	-0.01	**-0.14**	-0.08	**0.17**	**0.18**				
24	Board Nationality Mix Ratio	0.03	-0.01	0.00	-0.04	-0.05	0.02	**-0.17**	**-0.14**	0.03	**-0.13**			
25	TMT Age Diversity	-0.00	0.02	-0.04	-0.02	0.02	0.04	**0.13**	-0.00	-0.01	**-0.14**	0.07		
26	TMT Gender Diversity	0.12	0.02	0.03	**0.35**	-0.04	-0.07	-0.08	-0.03	0.01	**0.19**	-0.01	-0.04	
27	TMT Blau Index	0.05	-0.00	-0.02	-0.06	0.02	0.06	0.01	**-0.12**	**-0.14**	**-0.13**	0.04	-0.04	-0.03

Note. n = 6,702.

[a] $p < .10$ for correlations in bold.

Table 2. 2SLS Regression on AI Integration (Number of Job Postings Requiring AI Skills)

Predictor Variables	Model 1	Model 2	Model 3	Model 4
CEO Conservativeness	-0.453** (-2.00)	6.854* (1.74)	-4.015* (-1.90)	3.861** (2.51)
CEO Conservativeness × CEO Risk Exposure		-1.421* (-1.75)		-0.758*** (-2.71)
CEO Conservativeness × Exposure to Actual Risk Information			2.186* (1.71)	
CEO Risk Exposure		-1.044** (-2.42)		-0.846*** (-2.79)
RoA	0.111 (0.99)	1.764** (2.18)	-0.0272 (-0.14)	1.403** (2.40)
Firm Size	0.256*** (3.46)	0.209 (1.30)	0.292*** (2.96)	0.0619 (0.34)
Slack Resources	-0.00333 (-1.30)	0.177* (1.69)	0.00768 (0.98)	0.242 (0.78)
Sales	-0.0392 (-1.53)	0.263 (1.50)	-0.0407 (-0.98)	0.411* (1.71)
Industry Competition Index	-2.877***	-4.879***	-2.687**	-1.916

	(-2.95)	(-2.68)	(-2.41)	(-1.17)
Industry Competition Index Squared	3.552***	6.218***	3.256**	2.484
	(2.91)	(2.81)	(2.35)	(1.20)
R&D Intensity	0.198	-0.696	-0.0698	-0.343
	(1.03)	(-0.78)	(-0.17)	(-0.31)
CEO Power (Dual CFO)	0.188	-0.00809	0.174	-0.174
	(1.32)	(-0.02)	(1.23)	(-0.68)
CEO Power (Dual Board Director)	-0.0667	-0.282**	-0.0860	-0.258**
	(-1.11)	(-2.32)	(-1.21)	(-2.24)
CEO Gender (Female = 1)	0.0269	0.146	-0.160	0.113
	(0.24)	(0.70)	(-0.87)	(0.48)
CEO Stock Ownership	0.00573	0.494**	-0.00676	0.399***
	(0.62)	(2.40)	(-0.45)	(2.79)
CEO Tenure	0.0000949	0.0414**	-0.00162	0.0467***
	(0.03)	(2.01)	(-0.27)	(2.71)
Board Average Age	-0.00608	0.00192	-0.00761	0.0135
	(-0.92)	(0.14)	(-0.90)	(0.71)
Board Size	0.00375***	-0.00193	0.00430**	-0.00488
	(2.82)	(-0.64)	(2.19)	(-0.96)
Board Average Tenure	0.0869***	0.106***	0.0843***	0.0611***
	(8.51)	(6.01)	(6.99)	(2.61)
Board Gender Diversity	0.983***	0.585	0.812***	0.160

	(5.96)	(1.22)	(3.36)	(0.35)
Board Nationality Mix Ratio	0.403***	0.0727	0.589***	0.316
	(3.35)	(0.28)	(2.89)	(1.07)
TMT Age Diversity	-0.00181	-0.0107	-0.00606	-0.0201*
	(-0.36)	(-0.96)	(-0.82)	(-1.81)
TMT Gender Diversity	0.328**	0.119	0.0367	0.387
	(2.36)	(0.41)	(0.15)	(1.29)
TMT Blau Index	-0.0161	-0.0842	-0.0314	0.0411
	(-0.26)	(-0.60)	(-0.38)	(0.29)
N	6,702	5,366	6,702	2,608
FE	firm year	firm year	firm year	firm year

Note. Exposure to Actual Risk Information in Model 3 is omitted due to collinearity with firm fixed effects. In the first stage, TMT, State and Federal average political ideology in the past 10 years are strong instrumental variables for CEO political ideology (F-statistic = 89.92). t-statistics in parentheses.

* $p < 0.10$

** $p < 0.05$

*** $p < 0.01$

APPENDIX

A. Additional Analysis

TABLE A.1
2SLS Regression on CTO and AI Integration (Number of Job Postings Requiring AI Skills)

Predictor Variables	Model 5	Model 6
CEO Conservativeness	0.101*	
	(1.78)	
CTO Conservativeness		-5.088*
		(-1.70)
RoA	-0.00136	0.103
	(-0.04)	(0.58)
Firm Size	0.00128	0.263***
	(0.22)	(3.46)
Slack Resources	0.000125	-0.00297
	(0.26)	(-0.77)
Sales	0.000187	-0.0378
	(0.04)	(-1.13)
Industry Competition Index	-0.0220	-2.979***
	(-0.32)	(-2.92)
Industry Competition Index Squared	0.0344	3.714***
	(0.42)	(2.91)
R&D Intensity	-0.0108	0.146
	(-0.31)	(0.60)
CEO Power (Dual CFO)	-0.000994	0.184
	(-0.53)	(1.28)
CEO Power (Dual Board Director)	-0.0128	-0.132*
	(-1.55)	(-1.79)
CEO Gender (Female = 1)	0.00634	0.0552
	(1.15)	(0.50)

CEO Stock Ownership	0.000858	0.0101
	(1.30)	(1.09)
CEO Tenure	-0.000114	-0.000485
	(-0.49)	(-0.15)
Board Average Age	-0.000118	-0.00667
	(-0.21)	(-0.95)
Board Size	-0.000214*	0.00266*
	(-1.68)	(1.66)
Board Average Tenure	-0.00142	0.0797***
	(-1.37)	(7.20)
Board Gender Diversity	0.0384*	1.180***
	(1.67)	(5.52)
Board Nationality Mix Ratio	-0.00123	0.396***
	(-0.10)	(3.10)
TMT Age Diversity	0.0000417	-0.00160
	(0.08)	(-0.29)
TMT Gender Diversity	0.0183*	0.417***
	(1.80)	(2.92)
TMT Blau Index	0.00455	0.00729
	(0.66)	(0.10)
N	6,702	6,702
FE	firm year	firm year

Note. In the first stage of Model 5, TMT, State and Federal average political ideology in the past 10 years are strong instrumental variables for CEO political ideology (*F*-statistic = 89.92). In the first stage of Model 6, CEO political ideology and past TMT, State and Federal average political ideology are strong instrumental variables for CTO political ideology (*F*-statistic = 8.82). *t*-statistics in parentheses.

* $p < 0.10$

** $p < 0.05$

*** $p < 0.01$

TABLE A.2
2SLS Regression of CTO and CFO Politial Ideology

Predictor Variables	AI Integration	AI Integration
CTO Conservativeness	-5.780 (-1.48)	
CFO Conservativeness		-0.172 (-0.72)
RoA	-0.00136 (-0.04)	0.103 (0.59)
Firm Size	0.00128 (0.22)	0.263*** (3.46)
Slack Resources	0.000125 (0.26)	-0.00295 (-0.77)
Sales	0.000187 (0.04)	-0.0379 (-1.14)
Industry Competition Index	-0.0220 (-0.32)	-2.979*** (-2.92)
Industry Competition Index Squared	0.0344 (0.42)	3.713*** (2.92)
R&D Intensity	-0.0108 (-0.31)	0.146 (0.61)
CEO Power (Dual CFO)	-0.000994 (-0.53)	0.184 (1.28)
CEO Power (Dual Board Director)	-0.0128 (-1.55)	-0.131* (-1.79)
CEO Gender (Female = 1)	0.00634 (1.15)	0.0553 (0.50)
CEO Stock Ownership	0.000858 (1.30)	0.0101 (1.08)
CEO Tenure	-0.000114 (-0.49)	-0.000477 (-0.15)

Board Average Age	-0.000118	-0.00666
	(-0.21)	(-0.95)
Board Size	-0.000214*	0.00268*
	(-1.68)	(1.68)
Board Average Tenure	-0.00142	0.0798***
	(-1.37)	(7.21)
Board Gender Diversity	0.0384*	1.177***
	(1.67)	(5.51)
Board Nationality Mix Ratio	-0.00123	0.396***
	(-0.10)	(3.11)
TMT Age Diversity	0.0000417	-0.00160
	(0.08)	(-0.29)
TMT Gender Diversity	0.0183*	0.417***
	(1.80)	(2.92)
TMT Blau Index	0.00455	0.00691
	(0.66)	(0.10)
N	6,702	6,702
FE	firm year	firm year

Note. In the first stage, TMT, State and Federal average political ideology in the past 10 years are strong instrumental variables (F-statistic = 58.984). t-statistics in parentheses.

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

TABLE A.3
2SLS Regression on AI Integration (AI-using Firms)

Predictor Variables	AI Integration	AI Integration
CEO Conservativeness	-0.426*	7.440*
	(-1.89)	(1.85)
CEO Conservativeness × CEO Risk Exposure		-1.456*
		(-1.81)
CEO Risk Exposure		-1.191***
		(-2.80)
RoA	0.156	1.990**
	(1.62)	(2.45)
Firm Size	0.234***	0.189
	(3.01)	(1.07)
Slack Resources	-0.00359	0.162
	(-1.31)	(1.59)
Sales	-0.0438*	0.272
	(-1.81)	(1.51)
Industry Competition Index	-0.624	-3.448
	(-0.63)	(-1.62)
Industry Competition Index Squared	0.754	4.510*
	(0.62)	(1.75)
R&D Intensity	0.198	-0.457
	(1.21)	(-0.60)
CEO Power (Dual CFO)	0.0420	-0.322
	(0.59)	(-1.24)
CEO Power (Dual Board Director)	-0.0750	-0.278**
	(-1.15)	(-2.08)
CEO Gender (Female = 1)	0.0208	0.263
	(0.17)	(1.09)
CEO Stock Ownership	0.00466	0.570***
	(0.49)	(2.75)

CEO Tenure	-0.000811	0.0487**
	(-0.24)	(2.25)
Board Average Age	-0.00280	-0.000114
	(-0.42)	(-0.01)
Board Size	0.00368***	-0.00337
	(2.69)	(-0.98)
Board Average Tenure	0.0813***	0.102***
	(7.88)	(5.15)
Board Gender Diversity	0.908***	0.440
	(5.32)	(0.80)
Board Nationality Mix Ratio	0.329**	0.0906
	(2.51)	(0.32)
TMT Age Diversity	-0.00389	-0.0186
	(-0.79)	(-1.51)
TMT Gender Diversity	0.329**	0.137
	(2.36)	(0.42)
TMT Blau Index	-0.0136	-0.136
	(-0.22)	(-0.88)
N	5,952	4,735
FE	firm year	firm year

Note. In the first stage, TMT, State and Federal average political ideology in the past 10 years are strong instrumental variables for CEO political ideology (F-statistic = 89.92). t-statistics in parentheses.

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$