Feeling Right at Home: Hometown CEOs and Firm Innovation

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November 28, 2020

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We thank the seminar participants and faculty members at Florida State University, University of Central Florida, and Central South University for their helpful comments. We also want to thank Yijun Meng, Tiffany Thng, Xinjian Wang, Yeqin Zeng and Lei Zhao for their useful suggestions.

Acknowledgements: We would like to acknowledge the financial support from the National Natural Science Foundation of China (Grant No. 71974205, and Grant No. 71991483).

Abstract

Extending the theories of social and place identity, we predict that CEO hometown identity has a positive and significant influence on firm innovation. Our empirical evidence, from publicly traded firms in China during 2002-2016, suggests that a firm whose CEO's hometown is in the same province or city as the firm's headquarters tends to invest more in R&D and generate more patent applications. Our results are robust to the firm fixed effects and we use difference-in-differences analysis and instrument variable regressions to mitigate endogeneity concerns. CEOs' hometown identity still has a strong and positive impact on innovation after we control for measures of social capital of CEOs. We identify the mechanisms behind the positive relation between firm innovation and CEO hometown identity: hometown CEOs enjoy more support from the board of directors, they are more willing to take risks, and they are more likely to have long-term visions.

Keywords:

CEO hometown identity; Firm innovation; Social and place identity; Risk-taking; Long-term goals

1. Introduction

Innovation has become an increasingly important corporate strategy that boosts a firm's long-term growth and enhances its competitiveness (Chang et al., 2015). Given that innovation is often costly, risky, and long-term, standard pay-for-performance contracts tend to be limited in motivating top executives to undertake risky innovation projects (Manso, 2011; Sunder et al., 2017). Recent work has begun to explore the role of CEO personal traits on corporate innovation. For example, certain psychological orientations of CEOs, such as their risk-taking and long-term orientation, may significantly influence a firm's innovation performance.[1]

We focus on one of the most important dimensions of a CEO's personal background: her hometown identity. Our study is the first to investigate whether and how the CEO's hometown identity is reflected in the domain of firm innovation. Hometowns have a deep influence on personal characters and actions. Yonker (2017) finds that firms located near CEOs' childhood homes experience fewer employment cuts and pay reductions. Jiang et al. (2019) show that firms are more likely to acquire targets located in the states of their CEOs' childhood homes than similar targets from elsewhere. However, the evidence on the role of CEOs' hometown identity in firm decisions is still scarce, and both Yonker (2017) and Jiang, et al. (2019) suggest that hometown bias causes suboptimal decisions.

We apply and extend the social and place identity theories to develop the empirical hypothesis. Different from Yonker (2017) and Jiang, et al. (2019), we expect that CEOs' hometown identity has a significant and positive effect on corporate innovation: First, when the firm headquarters is located in the CEO's hometown, the CEO is able to receive great support from the locals, as he is regarded as in the same social group by others. Therefore, hometown CEOs may be more capable of taking on costly projects than non-hometown CEOs. Second, living and working in a familiar environment and culture may increase the hometown CEO's self-efficacy, which can lead him/her to be more willing to take risks. Third, cherishing the sustainable development of their

[1] See Galasso and Simcoe (2011), Hirshleifer, Low, and Teoh (2012), Yadav, Prabhu, and Chandy (2007), and Sunder, Sunder, and Zhang (2017).

hometowns, hometown CEOs may have a long-term orientation and may be willing to invest in long-term projects. Therefore, we expect that firms with hometown CEOs should engage more in innovation than those with non-hometown CEOs.

We utilize a sample of publicly traded firms listed on Shanghai and Shenzhen stock exchanges in China during 2002-2016 to study the impact of CEOs' hometown identity on firm innovation. There are two reasons why we choose Chinese firms to test our hypothesis. First, the strong sense of hometown identity has been deeply embedded in Chinese culture since ancient times, as every Chinese knows the idiom: "Just as the leaves fall to the roots of the tree, a person will eventually return to his hometown". Second, China consists of 34 provincial-level administrative regions, 56 ethnic groups, and more than 20 different dialects (Bian et al., 2019). The huge variations in environment and culture across geographic regions result in the uniqueness of each hometown to its own residents, which offers a rich context to study the effect of CEOs' hometown identity.

Our results show that firms with hometown CEOs have greater input and output of innovation than those without hometown CEOs. Firms with hometown CEOs tend to invest more in R&D and generate more patent applications. CEOs' hometown identity still has a significant and positive impact on innovation after we control for the potential social capital of CEOs, ruling out the social capital explanation. Our results are also robust while we control for firm fixed effects.

To address potential endogeneity issues, we utilize the following approaches. First, we extend our model with additional provincial or industrial time-varying factors to alleviate the concerns that our results are driven by time-varying omitted variables. Second, we rely on the variation in hometown identity generated by the turnover of the CEOs and re-estimate the baseline model using the DID (difference-in-differences) method. Third, we perform two-stage least squares (2SLS) regressions, using two instrumental variables to alleviate the concern of potential endogeneity problems.

Furthermore, we empirically test three potential channels through which CEOs' hometown identity affects firm innovation. We find that hometown CEOs receive more support from boards of directors, take more risks, and tend to focus on long-term goals. This evidence supports our theory that hometown identity enhances CEOs' willingness to take risks and engage in long-term projects.

Our paper contributes to the current literature in at least three ways. First, to the best of our knowledge, our work is the first to explore the impact of a CEO's hometown identity on firm innovation, contributing to the studies on the relation between CEO's personal traits and corporate policies. Second, we expand the social and place identity theories to the domain of hometown identity. Existing studies focus mainly on organizational, gender, and ethnic identity, etc., and we extend this line of research to the CEO's psychological orientations associated with her hometown identity. Our evidence indicates that the place identified by the CEO as her hometown can have a fundamental influence on her decision-making process. Third, Yonker (2017) and Jiang, et al. (2019) suggest that the impact of hometown bias is suboptimal for firms in terms of human resource allocation and merger activities. In contrast to their work, our findings show that hometown identity can enhance firm innovation, adding to the debate on how CEOs' personal traits impact corporate polices.

We organize the rest of the paper as follows: Section 2 briefly reviews relevant literature and develops the main hypothesis, Section 3 describes the sample and empirical design, Section 4 reports the empirical results, Section 5 explores the alternative theory of social capital, Section 6 discusses endogeneity issues, Section 7 tests the potential mechanisms, Section 8 reports heterogeneity analysis and robustness tests, and Section 9 concludes.

2 Literature Review and Hypothesis Development

2.1 Personal traits of CEOs and firm innovation

Innovation projects are risky, costly, and long-term commitments. Beyond the compensation contracts, the CEO's personal traits can be critical in corporate decisions on innovation. Existing studies have suggested that a firm's innovation can be explained by the CEO-level heterogeneity. Barker & Mueller (2002) find that R&D spending is greater in firms with younger CEOs. Lin et al. (2011) find that CEOs' education level, professional background, and political connections are associated with a firm's innovation efforts.

This line of investigation has also been extended to the domain of CEOs' certain psychological orientations. For example, CEOs' humility and narcissism, overconfidence, risk-taking, and long-term orientation may significantly influence a firm's innovation performance. Galasso and Simcoe (2011) document a positive relation between CEO overconfidence, measured by stock-option exercising, and citation-weighted patent counts, suggesting that overconfident CEOs are more likely to engage in innovation. Hirshleifer, Low, and Teoh (2012) also find that firms with overconfident CEOs invest more in innovation. Sunder, Sunder, and Zhang (2017) suggest that sensation seeking can be a personal trait to identify CEOs who are more likely to pursue and achieve innovation success. Yadav, Prabhu, and Chandy (2007) find that firms with more farsighted CEOs are better at innovation.

2.2 Hometown identity

According to the social identity theory, the self-concept of an individual encompasses not only a personal identity (e.g., one's traits, the "I") but also a social identity (e.g., the groups to which one belongs, the "We") (Ashforth, Harrison and Corley, 2008; Van Dick, Wagner, Stellmacher, and Christ, 2004; Deephouse and Jaskiewicz, 2013). The social identity is the result of individuals classifying themselves and others into social categories (Turner, Hogg, Oakes, Reicher, and Wetherell, 1987). These classifications enable individuals to make sense of their social environment and define themselves in relation to others (Ashforth and Mael, 1989). In studying the impact of environmental factors on human psychology, researchers extend identity theories to place identity (Proshansky, 1978). Proshansky, Fabian, and Kaminoff (1983) define place identity as a cluster of cognitions of physical settings that define who the individual is.

Hometown plays a crucial role in shaping a person's identity. The hometown is the place a CEO identifies with personally, and it inevitably influences the formation of her psychological characteristics. The sense of belonging to a certain place can satisfy the human need for security, comfort, and continuity (Moore, 2000; Nielsen-Pincus, Hall, Force, & Wulfhorst, 2010; Scannell & Gifford, 2010). Additionally, it can also invoke strong sentiments and subsequently prominently affect a person's cognitions and behavior (Scannell and Gifford, 2010).

Hometown identity is also a social group classification. Individuals can establish self-identity and form social groups according to their hometown status (Meagher, 2010). People from the same hometown tend to share common beliefs, values, and dialects (Hogg et al., 1995). Because an individual learns about her social roles and acceptable behaviors by interacting with other people in her hometown, hometown identity is an extension of both place identity and social identity. Hometown represents more than a geographic classification: it also has deep connections to environmental and social psychology (Qian & Zhu, 2014; Scannell & Gifford, 2010).

Hometown identity can influence a person's decision making. Although a few studies find that where politicians grow up can have a significant impact on their decision-making (e.g., Cohen et al. 2011; Knight, 2005; Hodler & Raschky, 2014), the evidence on the role of CEOs' hometown identity in firm decisions is still lacking, with the exceptions of Yonker (2017) and Jiang et al. (2019). The literature has not explored whether and to what extent a CEO's hometown identity can influence firm innovation.

2.3 CEO hometown identity and firm innovation

According to the social identity theory, people tend to classify themselves and others into different social groups. The classification determines how they treat each other, i.e., in-group preference versus out-group discrimination (Ashforth & Mael, 1989). An individual may like or support others from the same group. This affinity does not need to base on personal interaction but rather occurs simply by virtue of the common membership (Dion, 1973; Hogg & Turner, 1985; Ashforth & Mael, 1989). People from the same hometown may have common beliefs and values, and they may tend to agree with each other (Adarves-Yorno et al., 2006; Kang, Liu, Low, & Zhang, 2018).

The existing empirical studies suggest that board directors are likely to be from the local area. For example, Knyazeva, Knyazeva, and Masulis (2013) find that the size of the local labor market has a strong impact on the board composition, underlining the importance of local talents in the supply of independent directors. Ye (2014) also argues that many independent directors in Chinese firms are businessmen from local companies or professors from local business schools.

The implicit assumption of our study is that board directors are likely to come from the same province or city where the firm's headquarters is located. This assumption is consistent with the evidence provided by previous studies, e.g., Knyazeva et al. (2013) and Ye (2014). Further, we attempt to verify the assumption by obtaining the hometown information of directors for our sample. Since the information on directors' hometown is not a part of mandatory disclosure, manually collecting their hometown information for all the directors over the years is extremely time-consuming. For a snapshot, we manually collect the hometown information for directors as of year 2011, via internet searches and telephone interviews. Among all the independent directors for whom we are able to obtain their hometown information, 2,686 (70.6%) are from the same provinces as the firm headquarters, while only 1,120 (29.4%) come from provinces different from the firm headquarters. This finding supports the assumption that most of the independent directors are from local areas.

Sharing the same hometown with most of the independent directors enables hometown CEOs to receive more support from the board. As a result, the hometown CEOs' decisions will encounter less disagreement and criticism. For a CEO who receives more support from the board, she is more willing to pursue new investment and innovation activities. If a CEO encounters substantial disagreement from the directors, she is more likely to give up on costly innovations since she does not have the support to go ahead and take the risk (Hall et al., 2014).

Being in a social group also reduces subjective uncertainty and enhances feelings of security for an individual (Hogg, 2000; Hogg, 2001). Similarly, place identity enables an individual to feel a sense of belonging and self-control in a familiar environment (Korpela, 1989; Vaske & Kobrin, 2010; Twigger-Ross & Uzzell, 1996). A hometown CEO is familiar with the physical and cultural environment surrounding the company and the community, and she should feel secure and comfortable in her work and life (Nielsen-Pincus et al., 2010; Scannell & Gifford, 2010). The feelings of familiarity and safety may enhance her perceived self-efficacy (Lindsley, Brass, & Thomas, 1995). The optimistic self-evaluation of her own capabilities may have a positive impact on a CEO's willingness to take risks.

Finally, place identity should lead people to pursue the interests of their community (Carrus, Bonaiuto, & Bonnes, 2005; Twigger-Ross, Bonaiuto, & Breakwell, 2003). Studies have demonstrated that place identity can be linked to attention to environmental sustainability (Uzzell et al., 2002). Identifying with their own hometown motivates CEOs to care about the welfare and growth of their hometown; for example, they may be less likely to pursue short-term gains at the expenses of long-term interests, such as environmental pollution. Furthermore, hometown CEOs may be more likely to invest in long-term projects for the benefit of their hometown economy. That is, a hometown CEO is more likely to hold long-term visions and focus on future growth than a non-hometown CEO. When a CEO puts more value on future growth, her firm is more likely to be successful in identifying new technology and innovative opportunities (Yadav et al., 2007). Therefore, we have our main hypothesis:

Hypothesis: CEOs' hometown identity has a positive impact on firm innovation.

One can argue that a non-hometown CEO may have a different perspective and bring something new to the firm, which can potentially be beneficial to firm innovation. However, studies of Chinese labors have shown that it is difficult for outsiders to break into local culture, e.g., Hernández (2012). Compared to a hometown CEO, a non-hometown CEO is less likely to receive strong support from the board and less likely to have the long-term development as one of her priority goals. Therefore, despite the possible benefits from having an outsider as the CEO, we expect to observe a hometown advantage in terms of corporate innovation.

3. Empirical Design

3.1 Sample construction and data source

To investigate the impact of a CEO's hometown identity on firm innovation, we focus on industrial firms, an important part of China's national innovation system (NIS). Industrial firms' R&D spending is approximately 70% of China's total R&D expenditure (Sun & Du, 2010). Our sample begins with industrial enterprises listed on the Shanghai and Shenzhen stock exchanges during 2002-2016. We further exclude 55 companies that issue B shares, because firms issuing B shares are subject to different corporate governance structures and regulatory requirements (Chen et al., 2018).

We collect CEO characteristics and firm accounting information from the database of China Stock Market & Accounting Research (CSMAR). Because the disclosure of a CEO's hometown is not mandatory, we search the internet and conduct telephone interviews with CEOs to obtain this information if it is not available from CSMAR. Overall, we obtain the hometown information on 31.4% of the sample from CSMAR, and 44.8% from our internet search and telephone interviews, with the remaining 23.7% still missing on the CEO's hometown. We also obtain patent data from the State Intellectual Property Office (SIPO). We exclude the observations with missing variables, and our final sample includes 1,765 companies and 17,079 firm-year observations.

3.2 Variable construction and description

3.2.1. The CEO hometown identity (CEO_*HI*)

When a CEO's hometown is in the same province as the firm's headquarters, the CEO is called a hometown CEO, and the variable CEO_*HI* takes the value of one. Otherwise, CEO_*HI* takes the value of zero. When collecting the CEOs' hometown information, we find that most of the hometown information is reported only at the province level, with some disclosed at the city level. Therefore, we measure CEO hometown identity (CEO_*HI*) at the province level in the baseline analysis, and we also measure CEO hometown identity at the city level (CEO*_HI_ALT*) as part of the robustness test.[2]

3.2.2. Innovation measures

The inputs of innovation are often measured by research and development expenditures (R&D), while the outputs of innovation are often measured by the number of patent applications. We use three proxies to measure innovation input and output, including (1) *Ln* (Patent+1), the natural logarithm of (the number of patent applications+1); (2) *R&D Intensity*, the ratio of R&D expenses to total assets; and (3) *Ln (R&D+1)*, the natural logarithm of (R&D expenses+1). In additional analysis, we also examine innovation efficiency and quality by using the number of patents granted and the patent citations. Ln (GPatent+1) is the natural logarithm of the number of patents granted plus 1. Ln (Mcitation+1) is the natural logarithm of the average number of citations received by the firm's patents in a given year plus 1. Following Hall, Jaffe, and Trajtenberg (2001), we also scale the patent citations by the average citations of all patents applied for in the same year and in the same technology class, which is Ln (Wcitation+1).

3.2.3. Control variables

We control for CEO, firm, and regional characteristics that have been documented as important determinants of innovation in previous studies. These variables include the following:

Firm size (Assets). Hall and Ziedonis (2001) argue that large firms and capital-intensive firms generate more patents and citations. We thus use the natural logarithm of total assets to control for firm size (Chang et al., 2015).

Firm Age (Firm Age). Firms in different stages tend to make different strategic decisions and exhibit different investment behaviors. Younger firms normally have a higher level of risk tolerance that is essential to innovation success (Chang et al., 2015). We use the number of years since a firm was founded as a measure of firm age.

[2] Due to the limited availability of city-level data, we are only able to extract 5,942 observations with necessary information to construct CEO*_HI_ALT*.

Return on assets (ROA). ROA is included to capture operating profitability and the ability to invest in costly projects (Chang et al., 2015). We use the ratio of net income to total assets to measure the ROA.

State ownership (State Holding). The percentage of total shares outstanding owned by government entities. These entities include governments, government-affiliated institutions, and firms that are 100% owned by the government (Farag, Meng, & Mallin, 2015).

Institutional ownership (Institution Holding). Recent studies find that the presence of institutional investors improves firm innovation (Aghion, Reenen, and Zingales, 2013). We use shares held by institutional investors scaled by the total shares outstanding as a measure of institutional ownership.

Ownership of the largest shareholder (Top Holding). When holding a high proportion of shares outstanding, the largest shareholder of a firm is likely to be under-diversified and prefers that the firm takes a risk avoidance approach to minimize the likelihood of short-term loss. As a result, innovation inputs are likely to be lower (Kang et al., 2018). We use the ratio of shares owned by the largest investor to the total shares outstanding as the measure.

Board independence (Independence). Independent directors can be important in addressing the agency problem. Intervention by independent directors is often considered to be beneficial to shareholders' interests (Lange, Boivie, & Westphal, 2015). It is measured as the ratio of the number of independent directors to the total number of directors.

CEO age (CEO Age). When CEOs are older, they can be less willing to accept innovative ideas and investments. Musteen et al. (2006) argue that older CEOs tend to avoid risky innovation and resist reform.

CEO gender (Male). Huang and Kisgen (2013) find that male executives exhibit more overconfidence in corporate decision making than female executives. This indicator variable takes the value of one when the CEO is a male and zero otherwise.

CEO education (Education). Academic achievement is an important dimension of CEO human capital. Following Wiersema et al. (2018), we code *Education* as one if a CEO has a master's or higher degree, and zero otherwise.

Work experience in the finance industry (Finance). CEOs with experience in the financial industry can bring more reputation capital and sources of funding to the firms (Byrd and Mizruchi, 2005). This indicator variable takes the value of one when the CEO has working experience in the financial industry, and zero otherwise.

Per capita income (Per capita GDP). To control for the impact of regional economic development on firm innovation, we divide a province's GDP at the end of each year by its population to measure the per capita income.

We winsorize all continuous variables at the 1st and 99th percentiles to minimize the effects of potential outliers. Appendix A contains the list of all variables and their definitions.

3.3 Summary statistics

Table 1 reports the distribution of our sample by province. Columns 1 and 2 contain the number of observations in each province and the proportion of these observations in the full sample. Columns 3 and 4 report the distribution of CEOs' hometown provinces and the proportion of each province in the full sample. The last two columns report the number of firm-year observations with hometown CEOs by province and the percentage of these observations in each province. Overall, we have 8,277 firm-year observations with hometown CEOs, accounting for approximately 48.5% of the full sample.

Insert Table 1

Table 2 reports the distribution of the sample by industry. Columns 1 and 2 report the number of observations and the percentage in the full sample by industry. The highest number of observations, 1,936, is in the industry of manufacturing of computers, communication, and other electronic equipment (with the industry code C39). Columns 3 and 4 report the number and proportion of hometown CEOs in each industry. In the manufacturing of supplies for culture, education, art, sports, and entertainment (C24), hometown CEOs have the highest proportion, 82.26%.

Insert Table 2

Table 3 reports the summary statistics of the variables used in our analysis. The mean, standard deviation, 1st percentile, median, and 99th percentile are reported in Columns 1 to 5. We further sort the sample by non-hometown CEOs (CEO_*HI*=0, Columns 6 and 7) and hometown CEOs (CEO_*HI*=1, Columns 8 and 9). The differences in the mean value between the two groups are reported in Column 10.

Insert Table 3

Table 3 shows that firms with hometown CEOs, on average, have greater R&D expenses and R&D intensity than firms with non-hometown CEOs. Firms with hometown CEOs also apply for more patents than those with non-hometown CEOs. Further, firms with hometown CEOs tend to have more patents granted and greater patent citations than those with non-hometown CEOs. The differences between the two groups are significant at the 1% level. The univariate results suggest that firms managed by hometown CEOs seem to have greater innovation input, innovation output, and innovation quality than firms with non-hometown CEOs.

We also observe significant differences in most of the control variables between firms with hometown and non-hometown CEOs. Firms with hometown CEOs are, on average, smaller, younger, with higher ROA and lower holdings by the largest shareholder, state, and institutional investors. Compared to non-hometown CEOs, hometown CEOs are older and more likely to be female. Additionally, firms with hometown CEOs tend to be headquartered in provinces with lower per capita GDP.

3.4 Empirical design

To understand the relation between CEOs' hometown identity and firm innovation, we use ordinary least square (OLS) regression in the baseline analysis to estimate the following model:

$$Innovation_{it} = \beta_0 + \beta_1 CEO\_HI_{it} + \gamma X_{it} + Industry_c + Year_t + \varepsilon_{it} \tag{1}$$

The dependent variable, $innovation_{it}$, represents the innovation of firm i in year t. In the majority of our empirical analysis, we focus on the innovation input and output, measured by the natural logarithm of the number of patent applications plus one (*Ln(Patent+1)*), innovation intensity calculated as R&D expenses scaled by total assets (*R&D Intensity*), and the natural logarithm of R&D expenses plus one (*Ln(R&D+1)*). We also examine patents granted and patent citations in additional analysis. The main variable of interest is CEO*_HI*, which takes the value of one if the CEO's hometown is in the same province as the company's headquarters. As stated in our hypothesis, we predict β_1 to be positive and statistically significant. X_{it} is the set of control variables for CEO, firm, and regional characteristics. We control for year and industry fixed effects.

4. Baseline Results

Table 4 reports the results from the estimation of our baseline model. Innovation is measured by *Ln (Patent+1)*, *R&D Intensity*, and *Ln(R&D+1)* in Columns 1-3, respectively. We find that the coefficient of CEO hometown identity (CEO*_HI*) is positive and statistically significant at the 1% level. Based on the estimation result in Column 1, firms with hometown CEOs, on average, submit 34.8% more of patent applications than similar firms with non-hometown CEOs. This effect is economically significant. Similar results can be found when we measure innovation inputs by R&D expenses (R&D intensity and Ln(R&D+1)). With a hometown CEO, the R&D intensity of a firm is, on average, 0.086% higher than a firm with a non-hometown CEO. Considering that the average R&D intensity is 1.12%, this effect is also economically significant. These findings support our hypothesis that CEOs' home identity leads to larger innovation input measured by R&D expenses and better innovation output measured by patent applications.

To mitigate the concerns of omitted variables, we include firm fixed effects in the regressions to control for the time-invariant unobserved firm characteristics. The results are reported in Table 4, Columns 4 to 6. In presence of firm fixed effects, the hometown identity of CEOs is still significant and positive in influencing innovation input and output.

Insert Table 4

However, these results do not necessarily indicate that the innovation efficiency or quality is improving with a hometown CEO, therefore we conduct additional tests of innovation efficiency and quality. We first include the R&D expenses as the control variable in the regression of patent applications. According to Column 1 of Table 5, there is a positive and statistically significant relationship between R&D expenses and the patent applications, implying that an increase in innovation output is at least partially due to a higher R&D investment. Nevertheless, even after we control for R&D expenses, CEO hometown identity is still positively and significantly related to patent applications. These results reveal that the positive effect of CEO hometown identity on innovation output is not derived only from the increase in input.

Not all patent applications are successful. Therefore, we further examine the impact of the CEO hometown identity on the number of patents granted. Column 2 of Table 5 reports the estimated result of patents granted, and we find that there is a positive and statistically significant relationship between *CEO_HI* and the number of patents granted.

Finally, we also consider innovation quality as proxied by patent citations. Given a CEO's attachment to her hometown, it is possible that a hometown CEO goes beyond more R&D expenses. He/she may put more efforts to choose the more challenging projects that result in patents of higher quality. Therefore, the CEO hometown identity may also lead to an increase in the patent citations. Based on the studies of Hall et al., (2001) and Chang et al., (2015), we use two measures of patent citations. The first is the natural logarithm of one plus the average number of citations received by the firm's patents in a given year; the second measure is the natural logarithm of one plus the patent citations scaled by the average citations of all patents applied for in the same year and in the same technology class. The results in Columns 3-4 of Table 5 reveal that CEO hometown identity has a positive and significantly impact on innovation quality as indicated by the patent citations.

Insert Table 5

5. Alternative Theory: Social Capital

In this section, we discuss an alternative theory that can explain the positive relation between CEOs' hometown identity and firm innovation: it is possible that our measurement of CEO hometown identity is, in fact, a proxy for the CEO's social capital. Existing studies show that social capital can significantly reduce transaction costs, improve operation efficiency, accelerate information dissemination, and enhance the creativity of the firm (Adler, 2002; Brass, Galaskiewicz, Greve, & Tsai, 2004; Gabbay & Zuckerman, 1998; Granovetter, 1973; Nahapiet and Ghoshal, 1998).

Compared to non-hometown CEOs, hometown CEOs can have advantages in forming a strong social network. Hometown CEOs have many social connections that originate from their relatives and friends. Moreover, hometown CEOs are familiar with local dialects, environment, and culture, which enables them to establish more social connections at relatively lower costs. The social capital derived from the network can be beneficial for firm innovation. Therefore, the positive relationship between CEOs' hometown identity and corporate innovation can be explained by the advantages that hometown CEOs have in terms of social capital. To explore this alternative explanation of our results, we conduct the following three sets of additional tests.

5.1 Controlling for social capital

First, we directly control for the social capital of the CEOs in our regressions. Previous studies argue that social capital is essentially networking capital (Burt, 2009), and interpersonal connections are its foundation. Nahapiet & Ghoshal (1998) also argue that social capital is "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (p. 243). Therefore, it is possible to proxy for social capital with the strength of the social network.

Following previous studies, we divide social capital into three categories. The first category is political connections. A good relationship with the government enables firms to obtain the necessary resources and to influence policymaking. Following Cao et al. (2016), we create a dummy variable, *SC_Guanxi*, which takes the value of one when the CEO has served as a member in national or regional legislatures, e.g., People's Congress and People's Political Consultative Conference, and zero otherwise. The second category is business connections. CEOs with more business connections tend to have more social capital (Tesluk & Jacobs, 1998). We use the number of other firms on which the CEO is a member of the board of directors as an indicator of her business connections (*SC_Experience*). The third category is other types of social connections, such as being a member of trade unions, charity foundations, research institutions, or other non-profit organizations, which also provide CEOs opportunities to acquire information and derive social capital (Faleye et al., 2014). We create a dummy variable, *SC_Other*, which takes the value of one to indicate the presence of these types of membership, and zero otherwise. The information we use to construct the three variables is obtained from the CSMAR database.

The regression results controlling for social capital are reported in Table 6. Consistent with previous studies, we find that political connection (*SC_Guanxi*) and social connections (*SC_ Experience*) are positively related to innovation performance, showing the importance of social capital in corporate innovation. Nevertheless, the coefficient of CEO hometown identity (CEO*_HI*) remains positive and significant after we control for the three types of social capital. The evidence suggests that the improvement of innovation input and output led by the hometown CEO is not driven by the social capital effect.

Insert Table 6

5.2 CEO tenure and innovation performance

We also provide some indirect evidence that casts doubt on the social capital explanation. Hometown CEOs can have advantages in obtaining social capital. However, such comparative advantages should become weaker after CEOs have served for a longer term. Long tenure provides CEOs with plenty of opportunities to build up their social network. Therefore, we expect that the gap between the social capital obtained by hometown CEOs and non-hometown CEOs diminishes with CEO tenure. If our results can be explained by the social capital theory, the positive effect of

CEO hometown identity on innovation will be less prominent for CEOs with longer tenure. By contrast, if the hometown identity is the dominating story, the impact of CEOs' hometown identity on innovation performance does not diminish with CEO tenure.

To conduct the empirical test, we examine subsets of firms whose CEOs have tenures of at least three, four, and five years. The results are reported in Panels A, B, and C of Table 7, respectively. We find that with the increase of tenure, the coefficient of CEO*_HI* does not decrease significantly, suggesting that the effect of CEOs' hometown identity does not diminish over time. This finding supports the idea that hometown identity, rather than social capital, is the underlying driving force of the result.

Insert Table 7

5.3 The effect of CEO hometown identity on innovation performance over time

Figure 1 plots the percentage of firms with a hometown CEO in the sample from 2002-2016. We observe a steady decrease in the percentage of hometown CEOs starting from 2011, which indicates that, compared to the earlier period, CEOs in the more recent years are more likely to work away from their hometown.

Insert Figure 1

This change may be driven by the economic development of China. In the earlier time period, the under-developed transportation system, strictly regulated employment turnover, and highly unbalanced education resources led to low mobility among workers (Meng, 2012). As a result, local talents were more frequently chosen by firms as their CEOs. However, the strong economic growth and well-developed infrastructure in China in recent years have gradually increased the mobility of workers, leading to a downward trend in the proportion of hometown CEOs. Social connections are stronger when individuals move less frequently (Li, Savage, & Warde, 2008). If our findings are explained by the social capital, we should observe that the effect of hometown CEOs on innovation performance will be weaker in the later sample period.

To test this hypothesis, we split the sample into two parts: 2002-2011 and 2012-2016. The estimated results are reported in Table 8. We find that the effect of CEOs' hometown identity on innovation does not diminish in the later sample period, when the CEOs are more able to move. This finding is not consistent with the social capital explanation of our results.

Insert Table 8

6. Identification Issues

Although we have controlled for firm characteristics in our baseline model and we include firm fixed effects in Table 4, our findings may still be subject to potential endogeneity problems. For example, including firm fixed effects does not eliminate the potential estimation bias caused by time-varying, unobserved factors. In addition, it is also possible that our result is due to reverse causality: firms that conduct more innovation may be more attractive to local talents. In this section, we use three approaches to address potential endogeneity concerns: controlling for time-varying province and industry effects, the difference-in-differences analysis, and the instrumental variable regressions.

6.1 Control for time-varying province and industry effects

We have controlled for industry and year fixed effects in our baseline model, but it is likely that some unobserved *time-varying* regional or industrial factors can still influence our estimation and lead to biased results. For example, the regional clustering of business development in recent decades can be an important factor that influences firms' decisions regarding the choice of their location. The change in the supply and costs of input over time may also drive firms in some industries to move to a certain province.

To account for the potential time-varying variables related to geographic location and industry selection, we estimate our model incorporating the interaction dummies of province*year and industry*year and report our results in Table 9. As shown in the table, the coefficient of CEO_*HI* remains positive and significant, indicating that our results are unlikely to be driven by time-varying omitted variables.

Insert Table 9

6.2 Difference-in-differences analysis

Adopting the approach by Huang and Kisgen (2013), we exploit a variation in hometown identity: the turnover of CEOs.[3] Specifically, we compare the innovation before and after the transition from a non-hometown CEO to a hometown CEO with a control group changing from a non-hometown CEO to a non-hometown CEO. Compared to our baseline regression model with fixed effects, the DID model has the following two advantages: first, we compare the innovation after a transition with that before the transition, which can remove any unobservable time-invariant firm effects. Second, we use firms with a non-hometown CEO to non-hometown CEO transition as our control group, thereby eliminating other potential effects associated with the CEO turnover.

We estimate the following DID model to examine the effect of CEO hometown identity on firm innovation. The sample for these tests includes firms from three years before to three years after a CEO turnover.

$$Innovation_{it} = \beta_0 + \beta_1 Turnover_i \times Post_t + \beta_2 Turnover_i + \beta_3 Post_t + \gamma X_{it} + Industry_c + Year_t + \varepsilon_{it} \quad (2)$$

In this model, $Turnover_i$ is a dummy variable that takes the value of one if a firm changes from having a non-hometown CEO to a hometown CEO and takes the value of zero if a firm has a non-hometown CEO before and after the CEO turnover. $Post_t$ is an indicator that takes the value of one for the three years after CEO transition and zero for the three years before the change. The estimated results are reported in Columns 1 to 3 of Table 10. The positive and statistically significant coefficients of *Turnover*Post* in Columns 1 and 3 show that when a firm switches from a non-hometown to a hometown CEO, innovation tends to improve.

[3] As CEO departures may not be random, we cannot rule out the possibility of the endogenous matching between CEOs and firms.

We further consider the second case: the treatment group includes firms that change from hometown CEOs to non-hometown CEOs, and control groups are firms with hometown CEOs before and after the turnover. The estimated results are reported in Columns 4-6. The negative and statistically significant coefficients of *Turnover*Post* in Column 4 suggest that when the hometown CEO is replaced with a non-hometown CEO, the innovation tends to decrease. [4]

Insert Table 10

6.3 Instrumental variable analysis

In addition to the DID analysis, we use the instrumental variable regressions to mitigate potential endogeneity concerns. We utilize two instrument variables. First, similar to the approach adopted by Hochberg and Lindsey (2010) and Kang et al. (2018), we use the average value of CEOs' hometown identity of all other firms in the same province as the instrument. Because firms from the same province are operating in the same environment and enjoying a similar local culture, their willingness to hire local CEOs is likely to be similar. Therefore, CEOs' hometown identity is likely to be correlated across firms in the same province, and the relevance condition of the instrumental variable is satisfied. On the other hand, it is unlikely that firm innovation is directly influenced by the hiring of hometown CEOs of other firms; thus, the exclusion condition is also satisfied.

Second, we use the number of temples of Chinese traditional religions (Buddhism and Taoism) in a province as the instrument. The ideal instrument variable should have a strong correlation with CEO hometown identity, but it should not have a direct impact on the innovation. We believe the number of temples captures the cultural characteristics of a local community that are related to the CEO's hometown identity, and we can directly test the relation. At the same time, it is unlikely that the number of temples can directly influence firm-level innovation.

The results of the 2SLS instrumental regressions are reported in Panel A and Panel B of Table 11, respectively. The first instrument variable, "Average", in Panel A, is the average value

[4] We have repeated the analysis on the subset of unforced CEO turnovers, i.e., those due to retirement, health issues, etc. The results are qualitatively similar to those in Table 10.

of CEO_*HI* of all other firms in the province. The second instrument variable, "Temple", in Panel B, is the logarithm of the number of temples of Buddhism and Taoism at the provincial level. The first-stage estimation result shows that both instruments are positively related to the main variable of interest, CEO_*HI* (Column 1). The F-stat is 832.441 and 269.552, respectively, indicating that both instruments are strong. Similar to our baseline regressions, the two-stage least squares estimation results also show that the coefficient of CEO_*HI* is positive and statistically significant (Columns 2 to 4). These results provide further support for our hypothesis that hometown CEOs can enhance corporate innovation activities.

Insert Table 11

7. Potential Channels

In this section, we examine the potential channels via which CEOs' hometown identity influences innovation: the support received by hometown CEOs, the willingness to take risks by hometown CEOs, and the long-term orientation of hometown CEOs. These mechanisms are not necessarily mutually exclusive.

7.1 Hometown identity and support received by the CEOs

As discussed in Section 2, we predict that hometown CEOs receive more support from boards of directors and that they encounter less disagreement and criticism than non-hometown CEOs. As a result, it is possible that a hometown CEO is more capable of taking on costly and risky projects than a non-hometown CEO.

Using information provided by the CSMAR database, we create the variable *Support Ratio,* the percentage of corporate proposals supported by independent directors in year t, as the proxy for the support received by the CEO. Because many independent directors of Chinese firms are often executives from local companies or professors from local business schools (Knyazeva et al., 2013; Ye, 2014), they are more likely to be supportive of a hometown CEO. The estimation results are reported in Column 1 in Panel A of Table 12. The coefficient of CEO_*HI* is positive and statistically significant, suggesting that when a hometown CEO is in charge, corporate policies are more likely to be supported by the board members.

We further conduct analysis on the investment-related proposals. CSMAR database divides the proposals with the directors' voting records into 12 categories, with Category 6 being the proposals related to investment. Using the proposals directly related to investment, we re-estimate the model of the support ratio and report the results in Column 2 of Panel A. The positive and statistically significant coefficient of *CEO_HI* in Column 2 indicates that hometown CEOs receive more support for the investment-related proposals.

Insert Table 12

7.2 Hometown identity and risk taking

Hometown CEOs are familiar with the local physical and cultural environment, which may enhance their belief in their ability to perform and succeed, leading to an increased willingness to take risks. We examine this channel by conducting the following two tests.

First, we measure firm risk-taking behavior using earnings volatility, i.e., the standard deviation of ROA (the ratio of earnings before interest, taxes, depreciation, and amortization to total assets). We compute the standard deviation of ROA of firms over each (overlapping) consecutive 3-year period. This measurement of firm risk-taking is commonly used in financial studies (e.g., Kim, Patro, and Pereira, 2017, Koirala, Marshall, Neupane, and Thapa, 2020; Otchere, Senbet, and Zhu, 2020; etc.).

Second, we test whether firms with hometown CEOs still invest more in R&D than firms with non-hometown CEOs when they face financial constraints. In general, firms are less likely to engage in risky innovation activities during financial distress. If we observe that hometown CEOs still invest more in R&D, even with financial difficulties, than non-hometown CEOs, it indicates that hometown CEOs are more willing to take risks. Following Wruck (1990), we create a dummy variable, *distress*, which takes the value of 1 if a firm's ratio of cash flow to total debt is below the 25th percentile, and zero otherwise.

The estimation results are reported in Panel B of Table 12. The positive and statistically significant coefficient of CEO*_HI* in Column 1 suggests that firms with hometown CEOs have significantly higher levels of earning volatility, i.e., risk. The coefficient of CEO*_HI* Distress* is positive and statistically significant in Columns 2-4, indicating that hometown CEOs are more willing to take risks, even under financial constraints.

Two alternative measures of financial distress are also considered. Specifically, we identify a firm to be in financial distress if its Altman Z score is below the 25th percentile or its leverage ratio is above the industry median.[5] The results with using alternative measures of financial distress also show support that firms with hometown CEOs are less aggressive in cutting innovation during the financial difficulty. The results are available upon request.

7.3 Hometown identity and long-term orientation

Hometown CEOs may care about the sustainable development of their hometowns, and in particular, the long-term growth of their companies. We expect that hometown CEOs are more likely to hold long-term visions and focus on future growth than non-hometown CEOs. We examine this channel by conducting the following two tests.

First, we measure the long-term orientation of a firm by whether it obtains ISO14001 certification. ISO14001 is designed to help businesses reduce its environmental impact, intending to facilitate sustainable development by providing an internationally accepted system of standardization (Bansal & Hunter, 2003). In the process of working towards ISO14001 certification, firms identify and rectify operational inefficiencies and waste (Darnall and Kim 2012; Lim & Prakash, 2014), and these changes facilitate development of new & environmentally friendly products. A number of studies have found a positive impact of environmental certification on firm innovation (e.g., Shu, Zhou, Xiao, & Gao, 2016; Wagner, 2007; Ziegler & Nogareda, 2009). We

[5] According to Altman, Zhang & Yen (2007), there are distinct differences in the accounting procedures between the firms in China and those in the western world. They propose a specific way to calculate the Z-score for Chinese firms. We apply their approach to compute the Z-score for our sample firms. The leverage is the ratio of corporate liabilities to assets (liabilities/assets).

believe that ISO14001 certification is an important indicator of corporate social responsibility, which provides us with an objective valuation of how much a firm commits itself to sustainability and environmental protection. Passing the ISO14001 auditing can, therefore, indicate that a firm values long-term prosperity. We use the dummy variable *ISO14001*, which takes the value of one if a firm has passed ISO14001 auditing and zero otherwise.

Second, we examine whether firms with hometown CEOs invest more in R&D when they are near retirement than non-hometown CEOs nearing retirement. CEOs approaching their retirement age may reduce the level of commitment to long-term investment because they are unlikely to benefit from any investment with a delayed payoff (Kang, 2016). We create a dummy variable, *Retire*, which takes the value of one if a CEO's age is above 58 and zero otherwise.[6]

Our results are reported in Panel C of Table 12. The positive and statistically significant coefficient of CEO_*HI* in Column 1 shows that firms with hometown CEOs are more likely to adopt corporate policies that satisfy the ISO14001 standards, supporting our view that CEO hometown identity is aligned with the long-term orientation of the firm. When the CEO approaches retirement, the firm's number of patent applications decreases; however, the hometown identity mitigates the negative effect as the interaction term between CEO_*HI* and "*Retire*" is positive and significant. The evidence supports our expectation that hometown CEOs can improve innovation because they are more long-term oriented.

8. Additional Analysis and Robustness Tests

8.1 Heterogeneity analysis

We conduct heterogeneity analysis based on CEO gender, state ownership, and regions. Panel A of Table 13 reports the estimated results on firms with male and female CEOs separately. The coefficients of CEO_HI seem to be greater in firms with female CEOs (Columns 4 and 5) than in those with male CEOs (Columns 1 and 2) in the regressions of patent applications and R&D

[6] The typical retirement age is 60 for CEOs of Chinese firms.

intensity, however Chow-tests suggest that there is no statistically significant difference in these coefficients between male and female CEOs. Therefore, we cannot reject the hypothesis that the influence of CEO hometown identity on innovation is the same for firms with male and female CEOs.

We then examine the effect of CEO hometown identity in state-owned and non-state-owned firms. Based on the data provided by CSMAR, we create a dummy variable of state-owned enterprise (SOE), which takes the value of 1 if a company is defined as state owned.[7] Panel B of Table 13 shows that the coefficients on *CEO_HI* are positive but insignificant among SOE firms with exception of Column 1, whereas the coefficients on *CEO_HI* are all significant among non-SOE firms. Although we are tempted to argue that the effect of CEO hometown identity on innovation is stronger in the non-state-owned firms, further Chow-test tests show that there is no statistically significant difference between the coefficients in the two groups. Therefore, we cannot conclude that the effect of CEO hometown identity is stronger for the non-SOE firms.

Given China's cultural and geographic diversity, it is likely that the effect of hometown identity on innovation varies across different regions. To test this hypothesis, we divide our sample into two subsets: eastern region and central & western regions. Compared to less developed and more traditional central & western provinces, the eastern region is featured by more advanced economic development and less government interference in the economy.[8] Panel C of Table 13 reports the estimated results for the two regions, respectively. The coefficients of *CEO_HI* in the

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[7] Under Chinese laws, state owned firms are defined as firms that satisfy one of the following conditions: (1) solely state-owned enterprises (companies) established by governmental departments, institutions, or public institutions that contribute capital, and wholly state-owned enterprises in which 100% of the shares are directly and indirectly held by any of the above-mentioned entities or enterprises; (2) enterprises to which entities or enterprises as specified in (1) solely or jointly contribute capital and hold more than 50% of property rights (shares); (3) subsidiary enterprises to which any enterprise as specified in (1), (2), contributes capital externally, and holds more than 50% equities; and (4) enterprises which governmental departments, institutions and public institutions, or single state-owned or state-controlled enterprises directly and indirectly hold not more than 50% shares, but as the largest shareholder, are able to have actual control via shareholders' agreements. Source: https://www.pkulaw.com/en_law/055fee5450f5ff16bdfb.html.

[8] Eastern provinces include Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi, and Hainan; The central & western provinces include Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan, Sichuan, Chongqing, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Ningxia, Qinghai, and Xinjiang.

regressions for both regions are similar in magnitude with no statistically significant differences. Our main conclusion does not seem to vary across different regions.

Insert Table 13

8.2 Hometown identity and population mobility

We test the possible impact of population mobility on our results. Kasarda and Janowitz (1974) and Sampson (1988) provide evidence that mobility inhibits place attachment. With a greater population mobility, the local labor market is featured by a larger fraction of non-local talents (Knyazeva, Knyazeva, and Masulis 2013), and we should expect a higher proportion of non-local directors on the board. We divide our sample into two subsets based on the median value of the rate of population mobility and conduct the baseline regression on the two subsets respectively.[9] The results are reported in Panel A of Table 14. The impact of CEO hometown identity on innovation is smaller in presence of high population mobility, indicating that a larger proportion of stakeholders with different hometowns may alleviate the positive effect of hometown CEO on innovation.

Insert Table 14

8.3 CEO ability and Chairman hometown identity

One concern is that hometown identity can be associated with CEO ability. For example, CEOs who are more capable may choose to join firms in their hometown. Following Sunder et al. (2017), we measure CEOs' ability by their compensation. We estimate whether hometown CEOs earn greater compensation than non-hometown CEOs and report the results in Column 1 of Panel B in Table 14. Hometown CEOs' compensation is not significantly different from that of non-hometown CEOs. Our results do not support the argument that hometown CEOs have greater ability than non-hometown CEOs.

[9] We take the difference between the population at the end of the year and the population at the end of the previous year, and then multiple it by (1-natural growth rate of population) to derive the change in population due to mobility. The change in population due to mobility divided by the population at the end of year is the rate of population mobility. We obtain information on the population and the natural growth rate of population by province from the China City Statistical Yearbook.

In some of the state-owned enterprises as well as companies with CEO-Chairman duality, the chairman plays an important role. Thus, we collect information on the hometown identity of the chairman and examine whether the hometown identity of the chairman affects firm innovation by including the chairman's hometown identity (Chairman_*HI*) in the regressions. The results are reported in Columns 2-4 of Panel B in Table 14. In contrast to the insignificant effect of Chairman_*HI* on the innovation, the CEO hometown identity has a positive and statistically significant impact. It suggests that the hometown identity of CEO is more important in driving corporate innovation than the hometown identity of the chairman of the board.

8.4 Lagged innovation and previous innovation performance

We also conduct our tests by using lagged independent variables in the regressions, and the results are reported in Columns 1 to 3 of Panel C in Table 14. The results estimated from the lagged specifications are similar to those from our baseline model.

Another concern about the baseline model arises from the autocorrelation of the dependent variable because firms with more innovation may continue to innovate more in the future. To address the autocorrelation issue, we extend the baseline model by including the average number of patent applications in the past three years. The results are reported in Columns 4 to 6 of Panel C in Table 14. The coefficient of CEOs' hometown identity (CEO_*HI*) remains positive and statistically significant, showing that our main findings are not driven by the firm's past performance.

8.5 Different estimation methods

Our measurements of innovation are non-negative by definition. In addition, there are some years in which many firms do not invest in R&D or apply for patents at all, while a small number of firms produce a considerable volume of patent applications. To account for these distribution characteristics, we also adopt Tobit, the negative binomial and Poisson models. The findings, as reported in Panel D of Table 14, are similar to those in the baseline model.

8.6 Alternative definition of variables

We also estimate our results by examining CEOs' hometown identity at the city level. When a firm's headquarters city is the same as the CEO's birth city, CEO*_HI_ALT* takes the value of one and zero otherwise. We also use alternative proxies for innovation performance. There are three types of patents: invention, utility model, and design patents. Invention patents are considered as the most valuable and innovative type. We use the number of invention patent applications as an alternative to the overall number of patent applications and the percentage of R&D to the total revenue (*Intensity*2) as an alternative to *Intensity*. The results are reported in Panel E of Table 14, and our main findings hold.

8.7 Other robustness tests

We conduct additional tests to further establish the robustness of our results. First, when a firm decides to move its headquarters to another province, we observe a change in our main variable, CEOs' hometown identity.[10] To ensure that this change does not influence our findings, we add an indicator variable that controls for firms' location change. Second, we exclude firm-year observations when firms conduct mergers and acquisitions to rule out the possibility that CEOs increase innovation by external investments. Third, to alleviate the concern that our results are driven by family firms, we construct a dummy variable that takes the value of one for family-controlled firms and add this variable to our model. Fourth, to address the possibility that our results can be driven by the few large cities such as Beijing and Shanghai, we delete firms with headquarters in the four largest cities (Beijing, Shanghai, Shenzhen, and Guangzhou) and repeat the baseline regressions. We find that CEO hometown identity remains positive and significant in the regressions of innovation input and output. Finally, to ensure that our results are not driven by founding CEOs, we add a dummy variable that indicates whether CEOs are also the founding CEOs.

[10] There are 1,271 firm-year observations that change the headquarters location, accounting for 7.5% of the total observations.

The findings of our baseline model are robust to all these tests. These robustness tests are reported in Appendix B.

9. Conclusions

Innovation has become a core strategy to enhance the competitiveness of firms (Chang et al., 2015). We study the impact of CEOs' hometown identity on innovations and shed new light on the effectiveness of CEOs' psychological orientations on corporate policy. No prior research links CEOs' hometown identity with firm innovation, and our study fills this gap.

Utilizing the sample of Chinese companies from 2002 to 2016, our results show that firms with hometown CEOs have greater input and output of innovation than those without hometown CEOs. We rule out the social capital explanations of our findings, and our results remain robust in alternative specifications and tests. Furthermore, we explore the three channels through which CEOs' hometown identity can influence firm innovation: the support received by hometown CEOs, enhanced willingness of hometown CEOs to take risks, and the long-term orientation of hometown CEOs.

Our evidence indicates that the identification with her hometown has a strong influence on a CEO's decision-making and corresponding outcome in innovation. We provide new insights into the relationship between CEOs' personal characteristics and corporate policy, enriching our understanding of the importance of CEOs' psychological orientations. We demonstrate that hometown CEOs are more willing to take risks and tend to hold long-term visions. These results have important implications for corporate decision-making in firm innovation and beyond.

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Table 1 Sample distribution by province

This table provides the breakdown of the observations and the corresponding percentages by province. Columns 1-2 report the number of each province identified as firm headquarters and the percentage in the whole sample. The number of the observations identifying the province as the CEO's hometown and the percentage in the whole sample are reported in Columns 3-4. The last two columns report the number of firm-year observations with hometown CEOs and the percentage of these observations in each province.

Province	Headquarters of firms		CEO's hometown		Hometown CEO	
	n	% of all Obs.	n	% of all Obs.	n	% of province Obs.
	(1)	(2)	(3)	(4)	(5)	(6)
Beijing	989	5.79	372	2.18	227	22.95
Tianjin	239	1.40	126	0.74	66	27.62
Hebei	444	2.60	398	2.33	234	52.70
Shanxi	323	1.89	371	2.17	243	75.23
Inner Mongolia	274	1.60	153	0.90	108	39.42
Liaoning	418	2.45	387	2.27	173	41.39
Jilin	345	2.02	257	1.50	161	46.67
Heilongjiang	245	1.43	185	1.08	106	43.27
Shanghai	906	5.30	375	2.20	272	30.02
Jiangsu	1631	9.55	1458	8.54	936	57.39
Zhejiang	1641	9.61	1479	8.66	1070	65.20
Anhui	626	3.67	586	3.43	353	56.39
Fujian	567	3.32	423	2.48	361	63.67
Jiangxi	313	1.83	362	2.12	167	53.35
Shandong	1154	6.76	1011	5.92	665	57.63
Henan	591	3.46	490	2.87	307	51.95
Hubei	627	3.67	523	3.06	272	43.38
Hunan	520	3.04	572	3.35	297	57.12
Guangdong	2244	13.14	1180	6.91	989	44.07
Guangxi	225	1.32	108	0.63	72	32.00
Hainan	112	0.66	65	0.38	47	41.96
Chongqing	258	1.51	124	0.73	49	18.99
Sichuan	778	4.56	549	3.21	359	46.14
Guizhou	211	1.24	124	0.73	90	42.65
Yunnan	229	1.34	204	1.19	137	59.83
Tibet	91	0.53	20	0.12	20	21.98
Shanxi	267	1.56	290	1.70	127	47.57
Gansu	257	1.50	210	1.23	99	38.52
Qinghai	128	0.75	35	0.20	33	25.78
Ningxia	114	0.67	86	0.50	64	56.14
Xinjiang	312	1.83	178	1.04	173	55.45

Table 2 Sample distribution by industry

This table provides the sample distribution by industry. Columns 1-2 report the number of observations in each industry and the percentage of observations in the whole sample. Columns 3-4 report the number of and the proportion of hometown CEOs in each industry.

Industry	Industry Code	Firm-year obs		With hometown CEOs	
		n	% of all Obs.	n	% of industry obs.
		(1)	(2)	(3)	(4)
Mining and washing of coal	B06	309	1.81	152	49.19
Extraction of petroleum and natural gas	B07	63	0.37	28	44.44
Mining and processing of ferrous metal ores	B08	60	0.35	28	46.67
Mining and processing of non-ferrous metal ores	B09	214	1.25	53	24.77
Ancillary mining activities	B11	87	0.51	27	31.03
Processing of food from agric. products	C13	376	2.20	185	49.20
Manufacture of foods	C14	293	1.72	146	49.83
Manufacture of alcohol, beverages, and refined tea	C15	433	2.54	291	67.21
Manufacture of textiles	C17	336	1.97	197	58.63
Manufacture of textiles, clothing; apparel industry	C18	221	1.29	130	58.82
Manufacture of leather, fur, feather and related products; footwear industry	C19	45	0.26	34	75.56
Processing of timber, manufacture of wood, bamboo, rattan, palm, and straw products	C20	53	0.31	12	22.64
Manufacture of furniture	C21	55	0.32	36	65.45
Manufacture of paper and paper prod	C22	273	1.60	174	63.74
Printing and recorded media	C23	82	0.48	5	6.10
Manufacture of supplies for culture, education, art, sports, and entertainment	C24	62	0.36	51	82.26
Processing of petroleum, coking, processing of nuclear fuel	C25	154	0.90	77	50.00
Manufacture of chemical raw materials	C26	1613	9.44	802	49.72
Manufacture of medicines	C27	1691	9.90	742	43.88
Manufacture of chemical fibre	C28	231	1.35	158	68.40
Manufacture of rubber and plastics	C29	373	2.18	208	55.76
Manufacture of non-metallic mineral products	C30	653	3.82	302	46.25
Smelting and processing of ferrous metals	C31	393	2.30	170	43.26
Smelting and processing of non-ferrous metals	C32	609	3.57	302	49.59
Manufacture of metal products	C33	337	1.97	178	52.82
Manufacture of general purpose machinery	C34	740	4.33	442	59.73
Manufacture of special purpose machinery	C35	1123	6.58	594	52.89
Manufacture of automobiles	C36	776	4.54	393	50.64
Manufacture of railway, ships, aerospace, and other transportation equipment	C37	428	2.51	165	38.55
Manufacture of electrical machinery and equipment	C38	1569	9.19	744	47.42
Manufacture of computers, communication, and other electronic equipment	C39	1936	11.34	854	44.11
Manufacture of measuring instruments	C40	150	0.88	68	45.33
Other manufacturing	C41	90	0.53	42	46.67
Comprehensive use of waste resources	C42	47	0.28	24	51.06
Production and distribution of electric power and heat	D44	881	5.16	349	39.61
Production and distribution of gas	D45	155	0.91	36	23.23
Production and distribution of tap water	D46	168	0.98	78	46.43
Total		17,079	100.00	8,277	48.46

Table 3 Summary statistics

This table reports summary statistics of the variables. The full sample consists of 17,079 firm-year observations of Chinese firms in 2002-2016 with required data in our regressions. The non-hometown CEO sample includes firm-year observations that the CEO's hometown is not in the same province as the firm's headquarters. The hometown CEOs sample includes firm year-observations that the CEO's hometown is in the same province as the firm's headquarters. The column "Difference" reports the mean differences of variables between non-hometown CEOs and hometown CEOs. *, **, and *** denote the mean difference of variables are significant at the 10%, 5%, and 1% level, respectively. Detailed definitions of all variables are provided in Appendix A.

Variable	Obs.	All Sample					Non-hometown		Hometown		Difference
		Mean	SD	P1	P50	P99	Mean	SD	Mean	SD	T-test
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Independent variables											
CEO_*HI*	17079	0.485	0.5	0	0	1					
CEO_*HI_ALT*	5942	0.480	0.5	0	0	1					
Chairman_*HI*	17075	0.606	0.489	0	1	1					
Dependent variables											
Ln (Patent+1)	17079	1.465	1.599	0	1.099	5.905	1.287	1.556	1.654	1.623	-0.367***
R&D Intensity	17079	1.115	1.36	0	0.522	5.829	1.076	1.357	1.156	1.361	-0.080***
Ln (R&D+1)	17079	2.282	2.004	0	2.565	6.932	2.229	2.014	2.337	1.992	-0.109***
Ln (GPatent+1)	17079	1.369	1.450	0	1.099	5.472	1.232	1.419	1.516	1.468	-0.284***
Ln (Mcitation+1)	17079	1.321	1.511	0	0.851	5.599	1.200	1.487	1.451	1.524	-0.251***
Ln (Wcitation+1)	17079	1.332	1.521	0	0.851	5.603	1.209	1.496	1.464	1.535	-0.255***
Control variables											
Assets	17079	21.706	1.205	19.435	21.559	25.303	21.736	1.261	21.674	1.141	0.061***
Firm Age	17079	13.923	5.561	4	14	28	14.167	5.668	13.664	5.433	0.503***
ROA	17079	0.039	0.055	-0.184	0.036	0.196	0.036	0.054	0.041	0.056	-0.005***
State holding	17079	0.132	0.219	0	0	0.74	0.138	0.224	0.126	0.214	0.012***
Institution holding	17079	0.181	0.204	0	0.1	0.81	0.186	0.212	0.175	0.195	0.011***
Top holding	17079	0.375	0.158	0.091	0.356	0.79	0.381	0.163	0.368	0.151	0.013***
Independence	17079	35.826	6.592	15.38	33.33	55.56	35.74	6.576	35.917	6.607	-0.177*
CEO Age	17079	47.77	6.642	32	48	64	47.652	6.294	47.895	6.991	-0.242**
Male	17079	0.952	0.214	0	1	1	0.958	0.200	0.945	0.228	0.013***
Education	17079	0.535	0.499	0	1	1	0.574	0.494	0.492	0.500	0.082***
Finance	17079	0.035	0.184	0	0	1	0.034	0.182	0.036	0.186	-0.002
Per capita GDP	17079	0.454	0.266	0.058	0.406	1.166	0.471	0.280	0.435	0.247	0.036***
Other variables											
SC_Guanxi	17079	0.098	0.297	0	0	1	0.041	0.198	0.159	0.365	-0.118***
SC_Other	17079	1.384	2.764	0	0	13	1.166	2.629	1.615	2.884	-0.449***
SC_Experience	17079	0.032	0.176	0	0	1	0.015	0.123	0.05	0.217	-0.034***
Tenure	17079	39.662	32.265	1	31	147	35.113	29.039	44.5	34.728	-9.386***
Support Ratio	14852	99.182	6.517	66.667	100	100	99.104	6.639	99.263	6.387	-0.159
Risk-taking	15202	0.027	0.028	0.001	0.018	0.129	0.027	0.027	0.027	0.029	-0.001
Distress	17079	0.202	0.402	0	0	1	0.209	0.407	0.194	0.396	0.015**
ISO14001	17038	0.419	0.493	0	0	1	0.36	0.48	0.481	0.5	-0.121***
Retire	17079	0.053	0.223	0	0	1	0.044	0.205	0.062	0.240	-0.018***
Past 3_Pat	13361	6.722	16.128	0	1.732	80.158	5.788	14.18	7.724	17.932	-1.937***
CEO Pay	14651	5.485	6.139	0.327	4	30.424	5.555	5.65	5.413	6.602	0.141
Invention	17079	6.422	18.591	0	0	134	5.654	17.332	7.238	19.811	-1.585***
Ln (Invention+1)	17079	0.888	1.242	0	0	4.905	0.793	1.198	0.988	1.278	-0.195***
Intensity2	17077	2.091	2.661	0	0.858	12.659	2.049	2.709	2.136	2.607	-0.087**

Table 4 Baseline Regressions of innovation

Columns 1-3 report the results estimated from the OLS regressions of firm innovation input and output as measured by Ln (Patent+1), R&D Intensity, and Ln(R&D+1). Ln (Patent+1) is the natural logarithm of (the number of patent applications+1). R&D Intensity is the ratio of R&D to the total assets and Ln (R&D+1) is the natural logarithm of (R&D expenses+1). Columns 4-6 reports the results from the regressions with firm fixed effects. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote the significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.348***	0.086***	0.134***	0.167***	0.063*	0.121**
	(7.529)	(2.744)	(3.789)	(4.167)	(1.706)	(2.508)
Assets	0.378***	-0.133***	0.486***	0.218***	-0.077***	0.596***
	(12.499)	(-8.898)	(21.401)	(7.071)	(-2.643)	(13.227)
Firm Age	-0.023***	-0.030***	-0.040***	0.034***	0.093***	0.146***
	(-3.772)	(-8.078)	(-9.385)	(2.656)	(7.573)	(8.755)
ROA	2.741***	3.900***	2.758***	-0.271	1.620***	0.261
	(8.153)	(14.456)	(9.680)	(-1.160)	(6.627)	(0.864)
State holding	-0.274**	0.006	-0.110	-0.360***	0.126	0.045
	(-2.430)	(0.085)	(-1.057)	(-3.653)	(1.421)	(0.344)
Institution	0.116	0.133*	0.025	-0.250***	-0.170**	-0.488***
	(0.996)	(1.689)	(0.287)	(-3.496)	(-2.435)	(-5.164)
Top holding	-0.023	0.044	-0.048	-0.422**	0.252	-0.282
	(-0.130)	(0.386)	(-0.349)	(-2.386)	(1.354)	(-1.047)
Independence	0.001	-0.004*	-0.006**	-0.002	-0.007***	-0.007***
	(0.201)	(-1.826)	(-2.251)	(-0.853)	(-4.268)	(-2.685)
CEO Age	-0.002	0.002	0.001	-0.003	0.002	0.000
	(-0.564)	(1.020)	(0.547)	(-1.365)	(0.667)	(0.045)
Male	0.102	0.085	0.068	0.133	-0.018	0.004
	(1.111)	(1.470)	(1.038)	(1.587)	(-0.275)	(0.037)
Education	0.095**	0.050	0.054	0.038	0.009	0.037
	(2.146)	(1.591)	(1.566)	(1.154)	(0.287)	(0.811)
Finance	-0.261**	-0.204***	-0.232***	-0.127**	-0.088	-0.100
	(-2.566)	(-3.628)	(-2.737)	(-2.134)	(-1.473)	(-0.981)
Per capita GDP	0.304**	0.415***	0.407***	0.157	0.520**	1.184***
	(1.961)	(4.276)	(3.607)	(0.547)	(1.969)	(3.247)
Constant	-8.193***	2.110***	-10.673***	-3.735***	1.250**	-12.832***
	(-12.016)	(6.227)	(-19.441)	(-5.754)	(2.113)	(-13.152)
Industry fixed	Y	Y	Y			
Year fixed	Y	Y	Y	Y	Y	Y
Firm fixed				Y	Y	Y
Observations	17,079	17,079	17,079	17,079	17,079	17,079
R-squared	0.280	0.455	0.642	0.736	0.723	0.785

Table 5 Innovation efficiency and quality

Ln (GPatent+1) is the natural logarithm of the number of patents granted plus 1. Ln (Mcitation+1) is the natural logarithm of 1 plus the average number of citations to the firm's patents in a given year. Ln (Wcitation+1) is the natural logarithm of 1 plus patent citations scaled by the average citations of all patents applied for in the same year and in the same technology class. The t-statistics based on standard errors clustered at the firm level are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Innovation efficiency	Patents granted	Patent citations	
VARIABLES	Ln (Patent+1)	Ln (GPatent+1)	Ln (Mcitation+1)	Ln (Wcitation+1)
	(1)	(2)	(3)	(4)
CEO_*HI*	0.316***	0.257***	0.236***	0.239***
	(7.059)	(6.522)	(5.625)	(5.688)
Ln (R&D+1)	0.237***			
	(13.493)			
Assets	0.263***	0.320***	0.339***	0.340***
	(8.253)	(11.601)	(10.991)	(10.975)
Firm Age	-0.014**	-0.033***	-0.037***	-0.037***
	(-2.323)	(-6.121)	(-6.432)	(-6.465)
ROA	2.088***	1.557***	2.794***	2.806***
	(6.426)	(5.258)	(9.324)	(9.311)
State holding	-0.248**	-0.378***	-0.319***	-0.327***
	(-2.285)	(-3.858)	(-3.121)	(-3.196)
Institution holding	0.110	0.103	0.164	0.162
	(0.974)	(1.029)	(1.610)	(1.585)
Top holding	-0.012	-0.173	-0.245	-0.244
	(-0.068)	(-1.156)	(-1.487)	(-1.475)
Independence	0.002	0.002	-0.001	-0.001
	(0.652)	(0.633)	(-0.486)	(-0.493)
CEO Age	-0.002	-0.005*	-0.003	-0.003
	(-0.696)	(-1.880)	(-0.914)	(-0.879)
Male	0.086	0.043	0.090	0.089
	(0.963)	(0.542)	(1.074)	(1.066)
Education	0.082*	0.046	0.068*	0.067*
	(1.918)	(1.234)	(1.688)	(1.661)
Finance	-0.206**	-0.187**	-0.180**	-0.180*
	(-2.097)	(-2.116)	(-1.965)	(-1.951)
Per capita GDP	0.207	0.176	0.286**	0.286**
	(1.379)	(1.296)	(1.982)	(1.969)
Constant	-5.667***	-6.591***	-7.132***	-7.153***
	(-8.011)	(-10.639)	(-10.216)	(-10.193)
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	17,079	17,079	17,079	17,079
R-squared	0.311	0.339	0.315	0.316

Table 6 Controlling for social capital of CEOs

This table reports the results from the regressions of innovation input and output while controlling for the social capital of CEOs. *SC_Guanxi* is a dummy variable that takes the value of 1 when the CEO has served as a member in national or regional legislation institutions (people's congress and people's political consultative conference), and 0 otherwise. *SC_ Experience* is the number of other firms where the CEO is one of the board members. *SC_Other* is a dummy variable that takes the value of 1 in presence of these types of membership, such as trade unions, charity foundations, research institutions, or other non-profit organizations, and 0 otherwise. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)
CEO_*HI*	0.332***	0.062*	0.102***
	(7.010)	(1.946)	(2.826)
SC_Guanxi	0.134	0.158**	0.182***
	(1.544)	(2.430)	(2.965)
SC_Experience	0.010	0.017***	0.027***
	(1.185)	(2.847)	(4.594)
SC_Other	-0.095	-0.022	-0.031
	(-0.737)	(-0.233)	(-0.347)
Constant	-8.143***	2.182***	-10.554***
	(-11.911)	(6.484)	(-19.312)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	17,079	17,079	17,079
R-squared	0.281	0.458	0.644

Table 7 CEO tenures and innovation

This table reports the estimated results using subsets with different CEO tenures. Firms in Panel A include CEOs with at least three years of tenure, while Panel B (C) focuses on firms with CEOs having at least four (five) years of tenure. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln (R&D+1) (3)
Panel A: CEO tenures >=3 years			
CEO_*HI*	0.350***	0.097***	0.161***
	(6.405)	(2.636)	(3.837)
Constant	-8.505***	1.885***	-10.635***
	(-11.666)	(4.920)	(-17.040)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	13,534	13,534	13,534
R-squared	0.291	0.449	0.633
Panel B: CEO tenures >=4 years			
CEO_*HI*	0.340***	0.096**	0.110**
	(5.478)	(2.255)	(2.316)
Constant	-8.842***	1.675***	-10.960***
	(-10.957)	(3.996)	(-15.773)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	11,245	11,245	11,245
R-squared	0.284	0.449	0.634
Panel C: CEO tenures >=5 years			
CEO_*HI*	0.374***	0.116**	0.135**
	(5.433)	(2.469)	(2.573)
Constant	-8.526***	1.954***	-10.664***
	(-9.911)	(4.313)	(-14.506)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	9,908	9,908	9,908
R-squared	0.287	0.446	0.634

Table 8 The impact of hometown CEO on innovation: different time periods

This table reports the estimated results in two periods: 2002-2011, and 2012-2016. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: The period of 2002-2011			
VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln(R&D+1) (3)
CEO_*HI*	0.247***	0.085***	0.100***
	(4.898)	(3.200)	(2.609)
Constant	-7.689***	2.638***	-4.964***
	(-10.140)	(8.649)	(-8.281)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	8,935	8,935	8,935
R-squared	0.292	0.386	0.488
Panel B: The period of 2012-2016			
VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln(R&D+1) (3)
CEO_*HI*	0.455***	0.084*	0.162***
	(7.685)	(1.767)	(3.574)
Constant	-7.850***	2.499***	-14.597***
	(-8.921)	(4.676)	(-19.979)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	8,144	8,144	8,144
R-squared	0.226	0.335	0.546

Table 9 Control of time-varying province and industry effects

This table reports the results of baseline regressions including additional controls of time-varying province (Columns 1 to 3) or industry effects (Columns 4 to 6). The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Controls for the year trend of provinces			Controls for the year trend of industries		
VARIABLES	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.331***	0.060*	0.094***	0.342***	0.078**	0.115***
	(7.045)	(1.936)	(2.628)	(7.253)	(2.475)	(3.309)
Constant	-8.167***	1.471***	-11.698***	-8.006***	2.300***	-10.690***
	(-11.143)	(3.908)	(-19.885)	(-11.496)	(6.855)	(-20.173)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	N	N	N	N	N	N
Year fixed	N	N	N	N	N	N
Industry*year fixed				Y	Y	Y
Province*year fixed	Y	Y	Y			
Observations	17,079	17,079	17,079	17,079	17,079	17,079
R-squared	0.313	0.484	0.666	0.299	0.502	0.682

Table 10 Difference-in-Differences analysis

This table reports the estimated results from difference-in-differences (DID) regressions. In the first case, the treated group includes firms changing from non-hometown CEOs to hometown CEOs, while the control group consists of the firms that experience a turnover from a non-hometown CEO to a non-hometown CEO. The results for the first case are reported in the Columns 1 to 3. In the second case, the treated group includes firms that replace a hometown CEO with a non-hometown CEO, while the control group includes firms that have hometown CEOs before and after the turnover. The results for the second cases are reported in Columns 4 to 6. The variable "Post" represents the three years following the CEO change. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	The first case			The second case		
VARIABLES	Ln (Patent+1)	R&DIntensity	Ln (R&D+1)	Ln (Patent+1)	R&DIntensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
Turnover*Post	0.290***	0.113	0.312***			
	(3.050)	(1.501)	(2.795)			
Turnover	0.258**	0.075	0.113			
	(2.287)	(1.081)	(1.100)			
Post	-0.057	-0.147**	-0.265***			
	(-0.827)	(-2.567)	(-3.304)			
Turnover*Post				-0.367***	-0.079	-0.192*
				(-4.019)	(-0.994)	(-1.732)
Turnover				-0.033	-0.019	-0.057
				(-0.290)	(-0.251)	(-0.515)
Post				0.246***	0.070	0.129
				(2.839)	(1.006)	(1.257)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y	Y
Constant	-9.207***	1.943***	-10.068***	-7.489***	1.968**	-9.234***
	(-7.380)	(3.000)	(-8.550)	(-5.512)	(2.149)	(-6.078)
Observations	2,872	2,872	2,872	2,417	2,417	2,417
R-squared	0.339	0.472	0.638	0.350	0.443	0.574

Table 11 2SLS instrumental variable regressions

This table reports the estimated results from the two-stage least square (2SLS) instrument variables regressions. The first instrument variable, "Average", in Panel A, is the average value of CEO_*HI* of all other firms in the same province in year t. The second instrument variable, "Temple", in Panel B, is the logarithm of the number of temples of Buddhism and Taoism at the provincial level. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote the significance at the 10%, 5%, and 1% level, respectively.

Panel A: The provincial level of hometown identity excluding the sample firms

VARIABLES	First stage	Second stage		
	CEO_*HI*	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)
Average	0.898***			
	(11.640)			
CEO_*HI*		0.749***	0.519***	0.832***
		(3.052)	(3.262)	(4.507)
Constant	-0.238	-8.351***	1.920***	-10.971***
	(-1.130)	(-12.104)	(5.401)	(-19.452)
Controls	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	17,038	17,038	17,038	17,038
R-squared	0.097	0.264	0.432	0.613
F-value	832.441			

Panel B: The logarithm of the number of temples of Buddhism and Taoism at the provincial level

VARIABLES	First stage	Second stage		
	CEO_*HI*	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)
Temple	0.047***			
	(6.390)			
CEO_*HI*		0.787*	1.110***	1.794***
		(1.888)	(3.641)	(4.555)
Constant	-0.106	-8.366***	1.689***	-11.346***
	(-0.480)	(-11.787)	(4.019)	(-16.973)
Controls	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	17,038	17,038	17,038	17,038
R-squared	0.064	0.261	0.322	0.480
F-value	269.552			

Table 12 Potential mechanisms

We examine three channels via which CEO hometown identity can affect firm innovation. Panel A reports the results of the support received by the CEO, Panel B examines the risk-taking by the firm, and Panel C reports the results on the long-term orientation of firms. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: The support received by the CEO

Support ratio is the ratio of proposals supported by independent directors in year t. Column 2 reports the impact of hometown CEO on the support ratio of investment-related proposals.

VARIABLES	Support ratio	Support ratio (investment related)
	(1)	(2)
CEO_*HI*	0.195*	0.007*
	(1.701)	(1.681)
Assets	0.111*	0.001
	(1.834)	(0.304)
Firm Age	-0.012	-0.001
	(-1.271)	(-1.251)
ROA	3.061**	0.109
	(2.135)	(1.507)
State holding	0.610	-0.007
	(1.425)	(-0.350)
Institution holding	0.110	0.001
	(0.470)	(0.118)
Top holding	0.328	0.010
	(0.893)	(0.602)
Independence	0.006	-0.000
	(0.530)	(-1.136)
CEO Age	-0.004	-0.000
	(-0.518)	(-0.498)
Male	0.013	0.010
	(0.052)	(0.930)
Education	-0.033	0.003
	(-0.278)	(0.566)
Finance	-0.834*	-0.001
	(-1.865)	(-0.046)
Per capita GDP	0.280	0.006
	(1.273)	(0.809)
Constant	96.690***	0.944***
	(66.163)	(11.543)
Industry fixed	Y	Y
Year fixed	Y	Y
Observations	14,852	2,073
R-squared	0.088	0.074

Panel B: Risk-taking and hometown CEOs

Earning volatility is the standard deviation of ROA (the ratio of earnings before interest, taxes, depreciation, and amortization to total assets) during a three-year period. Distress takes the value of 1 if a firm's ratio of cash flow to the total debt is below the 25th percentile and 0 otherwise.

VARIABLES	Earning volatility	Innovation with financial distress		
		Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)
CEO_*HI*	0.001*	0.309***	0.050	0.076**
	(1.698)	(6.422)	(1.489)	(2.184)
CEO_*HI** Distress		0.187**	0.172***	0.280***
		(2.207)	(3.137)	(3.438)
Distress		-0.323***	-0.326***	-0.402***
		(-5.141)	(-7.868)	(-6.460)
Assets	-0.003***	0.392***	-0.119***	0.502***
	(-8.395)	(12.874)	(-8.016)	(22.099)
Firm Age	0.000**	-0.022***	-0.029***	-0.038***
	(2.002)	(-3.535)	(-7.722)	(-9.055)
ROA	-0.128***	2.326***	3.466***	2.282***
	(-13.659)	(6.926)	(12.622)	(7.995)
State holding	-0.004**	-0.286**	-0.007	-0.123
	(-2.011)	(-2.536)	(-0.101)	(-1.194)
Institution holding	0.002	0.102	0.119	0.008
	(1.108)	(0.879)	(1.525)	(0.093)
Top holding	-0.001	-0.010	0.056	-0.031
	(-0.554)	(-0.057)	(0.503)	(-0.232)
Independence	-0.000	0.000	-0.004*	-0.006**
	(-1.173)	(0.128)	(-1.950)	(-2.391)
CEO Age	0.000	-0.002	0.002	0.001
	(0.624)	(-0.601)	(0.978)	(0.494)
Male	-0.002	0.099	0.082	0.064
	(-1.515)	(1.083)	(1.429)	(0.994)
Education	0.001**	0.096**	0.051*	0.056
	(1.969)	(2.193)	(1.657)	(1.642)
Finance	0.000	-0.268***	-0.210***	-0.241***
	(0.166)	(-2.647)	(-3.784)	(-2.837)
Per capita GDP	-0.001	0.000*	0.000***	0.386***
	(-0.321)	(1.843)	(4.089)	(3.477)
Constant	0.112***	-8.457***	1.834***	-10.979***
	(12.430)	(-12.331)	(5.446)	(-20.083)
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	15,202	17,079	17,079	17,079
R-squared	0.128	0.283	0.460	0.645

Panel C: The long-term orientation of firms

Panel B reports the estimated results from the regressions of long-term orientation of the firms. The long-term orientation of firms is measured with ISO14001 certification, which is a dummy variable that takes the value of 1 to indicate firms passing ISO14001 auditing and 0 otherwise. Columns 2 and 3 report the tests of the long-term orientation with CEO retirement. “Retire” takes the value of 1 if the CEO’s age is above 58, and 0 otherwise. Column 1 uses a Probit regression and other columns use OLS regressions.

	ISO14001	CEO retiring		
VARIABLES		Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)
CEO_*HI*	0.110***	0.333***	0.079**	0.120***
	(7.554)	(7.062)	(2.479)	(3.383)
CEO_*HI* *Retire		0.288*	0.148	0.256*
		(1.895)	(1.228)	(1.827)
Retire		-0.197*	-0.132	-0.097
		(-1.762)	(-1.580)	(-0.903)
Assets	0.050***	0.379***	-0.133***	0.487***
	(6.186)	(12.520)	(-8.859)	(21.435)
Firm Age	-0.012***	-0.023***	-0.030***	-0.040***
	(-6.178)	(-3.744)	(-8.044)	(-9.394)
ROA	0.390***	2.755***	3.910***	2.764***
	(3.489)	(8.190)	(14.493)	(9.719)
State holding	-0.001**	-0.271**	0.006	-0.104
	(-2.577)	(-2.408)	(0.094)	(-1.005)
Institution holding	0.010	0.117	0.133*	0.028
	(0.279)	(1.010)	(1.691)	(0.325)
Top holding	-0.011	-0.025	0.043	-0.051
	(-0.188)	(-0.143)	(0.379)	(-0.372)
Independence	-0.004***	0.001	-0.004*	-0.006**
	(-3.586)	(0.184)	(-1.836)	(-2.277)
CEO Age	-0.001	-0.001	0.003	0.001
	(-0.838)	(-0.342)	(1.291)	(0.219)
Male	-0.036	0.100	0.085	0.065
	(-1.184)	(1.094)	(1.461)	(1.001)
Education	-0.017	0.094**	0.049	0.055
	(-1.207)	(2.135)	(1.568)	(1.585)
Finance	-0.075**	-0.260**	-0.202***	-0.233***
	(-2.263)	(-2.557)	(-3.597)	(-2.736)
Per capita GDP	0.000*	0.307**	0.417***	0.409***
	(1.952)	(1.983)	(4.296)	(3.619)
Constant	-0.896***	-8.226***	2.072***	-10.650***
	(-4.504)	(-12.011)	(6.109)	(-19.296)
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	17,038	17,079	17,079	17,079
R-squared	0.267	0.280	0.455	0.642

Table 13 Heterogeneity analysis

This table reports the results from heterogeneity analysis by CEO gender, state ownership, and region. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** significance at the 10%, 5%, and 1% level, respectively.

Panel A: The effect of CEO hometown identity on innovation: by gender
We split the sample based on the CEO gender. Male=1 for male CEOs and 0 otherwise.

	Male=1			Male=0		
VARIABLES	Ln	R&D Intensity	Ln(R&D+1)	Ln (Patent+1)	R&DIntensity	Ln(R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.334***	0.082**	0.134***	0.700***	0.182	0.079
	(7.031)	(2.534)	(3.686)	(4.346)	(1.530)	(0.602)
Constant	-8.081***	2.236***	-10.542***	-9.556***	0.992	-13.093***
	(-11.664)	(6.550)	(-18.979)	(-4.479)	(0.711)	(-8.122)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y	Y
Observations	16,259	16,259	16,259	820	820	820
R-squared	0.281	0.455	0.642	0.391	0.534	0.722

Panel B: The effect of CEO hometown identity on innovation: by SOEs
This panel reports the estimated results for firms of SOEs & non-SOEs. SOE is an indicator variable which takes the value of 1 if a company is controlled by the central or local government and 0 otherwise.

	SOEs=1			SOEs=0		
VARIABLES	Ln	R&DIntensity	Ln(R&D+1)	Ln (Patent+1)	R&DIntensity	Ln(R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.266***	0.048	0.083	0.415***	0.094**	0.166***
	(3.903)	(1.169)	(1.547)	(6.829)	(1.993)	(3.700)
Constant	-8.472***	1.891***	-9.744***	-6.479***	2.296***	-11.985***
	(-9.161)	(4.062)	(-13.371)	(-6.482)	(3.711)	(-12.824)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y	Y
Observations	8,120	8,120	8,120	8,959	8,959	8,959
R-squared	0.365	0.437	0.637	0.223	0.402	0.637

Panel C: The effect of CEO hometown identity on innovation: by region
This panel reports the estimated results for firms in eastern and central & western regions.

	Eastern region			Central and western regions		
VARIABLES	Ln (Patent+1)	R&DIntensity	Ln(R&D+1)	Ln (Patent+1)	R&DIntensity	Ln(R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.372***	0.112***	0.148***	0.330***	0.021	0.099*
	(6.101)	(2.603)	(3.299)	(4.871)	(0.485)	(1.749)
Constant	-8.245***	2.106***	-10.773***	-7.059***	1.703***	-10.884***
	(-9.167)	(4.711)	(-15.370)	(-6.667)	(3.107)	(-12.843)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y

Year fixed	Y	Y	Y	Y	Y	Y
Observations	10,345	10,345	10,345	6,734	6,734	6,734
R-squared	0.266	0.459	0.653	0.316	0.416	0.621

Table 14 Robustness tests

This table reports the results from several robustness tests. The t-statistics based on standard errors clustered at the firm level are reported in the parentheses. *, **, and *** significance at the 10%, 5%, and 1% level, respectively.

Panel A: The impact of hometown CEO on innovation by population mobility

This panel reports the estimated results from the baseline regressions, by population mobility.

	Subset of high population mobility			Subset of low population mobility		
VARIABLES	Ln	R&D Intensity	Ln (R&D+1)	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI*	0.322***	0.084**	0.095**	0.377***	0.100**	0.184***
	(5.580)	(2.153)	(2.329)	(6.781)	(2.533)	(3.884)
Constant	-8.446***	2.385***	-10.012***	-7.709***	2.061***	-11.077***
	(-10.269)	(5.651)	(-15.924)	(-9.466)	(4.595)	(-15.565)
Controls	Y	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y	Y
Observations	8,642	8,642	8,642	8,437	8,437	8,437
R-squared	0.300	0.494	0.684	0.272	0.420	0.602

Panel B: CEO ability and Chairman hometown identity

Column 1 reports the impacts of hometown identity on CEO pay, which is the total compensation of the CEO. Column 2 to 4 report the estimated results controlling for the hometown identity of the chairman of the board (Chairman_HI).

VARIABLES	CEO pay	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)
CEO_*HI*	0.004	0.334***	0.085***	0.126***
	(0.019)	(7.199)	(2.739)	(3.474)
Chairman_*HI*		0.046	0.005	0.026
		(0.921)	(0.167)	(0.689)
Constant	-39.819***	-8.237***	2.105***	-10.699***
	(-9.750)	(-12.112)	(6.165)	(-19.511)
Controls	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y
Observations	14,651	17,075	17,075	17,075
R-squared	0.237	0.280	0.455	0.642

Panel C: Lagged innovation and previous innovation performance

This panel reports the estimated results of regressions with lagged independent and controlling for the average number of patent applications in the past 3 years, respectively.

VARIABLES	Results of lagged independent variables			Control for 3-year average number of patents		
	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)	(4)	(5)	(6)
L1.CEO_*HI*	0.346***	0.073**	0.121***			
	(6.985)	(2.143)	(3.125)			
CEO_*HI*				0.308***	0.072**	0.117***
				(7.136)	(2.003)	(2.888)
Past 3_Pat				0.039***	0.008***	0.010***
				(13.155)	(6.543)	(6.620)
Constant	-8.425***	1.915***	-10.849***	-5.357***	2.516***	-10.790***
	(-11.720)	(5.302)	(-18.538)	(-8.024)	(6.420)	(-17.253)
L1.Controls	Y	Y	Y			
Controls				Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y	Y
Observations	14,914	14,914	14,914	13,361	13,361	13,361
R-squared	0.279	0.447	0.636	0.405	0.444	0.632

Panel D: Different estimation methods

Columns 1 to 3 report estimation results from the Tobit model. Columns 4 and 5 use negative binomial and Poisson regression respectively for the number of patent applications.

VARIABLES	Tobit			Negative binomial	Poisson
	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)	Patent	Patent
	(1)	(2)	(3)	(4)	(5)
CEO_HI	0.348***	0.086***	0.134***	0.318***	0.335***
	(7.543)	(2.749)	(3.796)	(4.842)	(4.223)
Constant	-8.192***	2.111***	-10.674***	-13.458***	-13.835***
	(-12.037)	(6.241)	(-19.480)	(-15.693)	(-19.175)
Controls	Y	Y	Y	Y	Y
Industry fixed	Y	Y	Y	Y	Y
Year fixed	Y	Y	Y	Y	Y
Observations	17,079	17,079	17,079	17,079	17,079

Panel E: Alternative definitions of variables

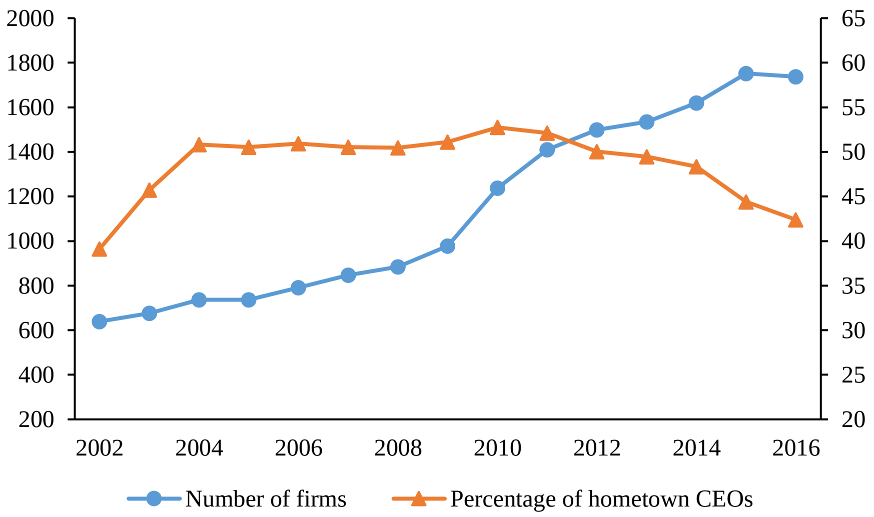
Columns 1 to 3 include the measure of hometown identity at the city level, and Columns 4 to 6 report the estimated results of alternative dependent variables. When the firm's headquarters city is the same as the CEO's hometown city, the value of CEO_*HI_ALT* is 1, and 0 otherwise. Invention, Ln (Invention+1), and Intensity2 are defined in the Appendix.

VARIABLES	Alternative definition of independents			Alternative definition of dependents		
	Ln(Patent+1)	R&D Intensity	Ln(R&D+1)	Invention	Ln(Invention+1)	Intensity2
	(1)	(2)	(3)	(4)	(5)	(6)
CEO_*HI_ALT*	0.376***	0.139**	0.229***			
	(4.535)	(2.442)	(3.614)			
CEO_*HI*				1.870***	0.198***	0.129**
				(3.139)	(5.570)	(2.164)
Constant	-9.589***	2.518***	-11.446***	-114.562***	-5.921***	6.534***

	(-9.304)	(4.904)	(-13.454)	(-8.846)	(-10.774)	(9.759)
Controls	Y	Y	Y	Y	Y	
Industry fixed	Y	Y	Y	Y	Y	
Year fixed	Y	Y	Y	Y	Y	
Observations	5,942	5,942	5,942	17,079	17,079	17,077
R-squared	0.274	0.449	0.632	0.194	0.265	0.492

Figure 1: The percentage of hometown CEOs and the number of firms by year

The graph plots the number of sample firms in each year (the left y-axis), and the percentage of firms with hometown CEOs in each year (the right y-axis).



Appendix A: Variable definitions

Variable	Definitions
Independent variables	
CEO_*HI*	CEO hometown identity. A dummy variable takes the value of 1 when the firm's headquarters is in the same province as the CEO's hometown, and 0 otherwise.
CEO_*HI_ALT*	Alternative measure of CEO hometown identity. When the CEO's hometown city is the same as the city of the firm's headquarters, the variable takes the value of 1, and 0 otherwise.
Chairman_*HI*	Chairman hometown identity. A dummy variable takes the value of 1 when the firm's headquarters is in the same province as the Chairman's hometown, and 0 otherwise.
Dependent variables	
Ln (Patent+1)	Ln (the number of patent application in each year+1).
R&D Intensity	R&D expenses/Total Assets *100%.
Ln (R&D+1)	Ln (R&D expenses+1).
Ln(GPatent+1)	The natural logarithm of granted patent plus 1.
Ln(Mcitation+1)	The natural logarithm of the average number of citations to the firm's patents in a given year plus 1.
Ln(Wcitation+1)	The natural logarithm of 1 plus weighted-citations which is scaled by the average citations of all patents applied for in the same year and in the same technology class.
Control variables	
Assets	Ln (Total assets +1).
Firm Age	Number of years since a firm was founded.
ROA	The ratio of net income to the total assets.
State holding	The percentage of total shares outstanding owned by government entities. These entities include governments, government-affiliated institutions, and firms that are 100% owned by the government.
Institution holding	Total shares held by institutional investors scaled by the total shares (%).
Top holding	The percentage of total shares outstanding held by the largest shareholder.
Independence	The ratio of the number of independent directors to the total number of directors (%).
CEO age	Age of CEO.
Male	An indicator takes the value of 1 when CEO is a male, and 0 otherwise.
Education	An indicator takes the value of 1 if the CEO has a Master or Doctoral degree, and 0 otherwise.
Finance	Indicator for the CEO's financial industry work experience. It takes the value of 1 if the CEO has worked in financial institutions including: regulators, bank, insurance company, investment companies, mutual funds, and security exchange, and 0 otherwise.
Per capita GDP	The province's GDP at the end of each year divided by the population (in CNY 10 thousand per capita).
Other variables	
SC_Guanxi	Indicator variable that takes the value of 1 if a CEO has working experience in national or regional legislation institutions: People's Congress or People's Political consultative conference, 0 otherwise.
SC_Other	Indicator variables that takes the value of 1 when a CEO has working experience in other type of social network, such as trade union, charity institution, research institution or other non-profit organization.
SC_Experience	The number of other firms where the CEO is serving as a board member.
Tenure	Number of months since the CEO is appointed.
Support ratio	Percentage of board proposals supported by independent directors.
Risk-taking	The standard deviation of ROA over a three-year period.
Distress	Indicator variables takes the value of 1 if a firm's ratio of cash flow to the total debt is below 25^{th} percentile of the sample, and 0 otherwise.
ISO14001	An indicator variable that takes the value of 1 if the firm has passed ISO14001 auditing, and 0 otherwise.
Retire	Retire takes the value of 1 if the CEO's age is above 58, and 0 otherwise.
Past 3_Pat	Average number of patents applied in the past 3 years.
CEO Pay	Total compensation of the CEO (in CNY 10 thousand).
Invention	The number of invention patent applications in year t.
Ln (Invention+1)	Ln (Invention+1).
Intensity2	R&D expenses/Total sales *100%

Appendix B: Additional robustness tests

Panel A: Controlling for firms' address changes

This panel reports the estimated results that we conduct a test by adding an indicator variable that controls for firms' address changes.

VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln (R&D+1) (3)
CEO_*HI*	0.345***	0.085***	0.132***
	(7.468)	(2.714)	(3.751)
Address	-0.151***	-0.049	-0.070*
	(-3.765)	(-1.514)	(-1.843)
Constant	-8.166***	2.118***	-10.662***
	(-11.975)	(6.247)	(-19.393)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	17,079	17,079	17,079
R-squared	0.281	0.455	0.642

Panel B: Excluding observations of firms conducting mergers and acquisitions

This panel reports the estimated results of excluding firm-year observations when firms conduct mergers and acquisitions.

VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln (R&D+1) (3)
CEO_*HI*	0.291***	0.098***	0.133***
	(6.131)	(3.165)	(3.491)
Constant	-8.396***	2.090***	-9.563***
	(-12.346)	(5.918)	(-16.755)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	10,158	10,158	10,158
R-squared	0.305	0.468	0.632

Panel C: Controlling for the impact of family firms

This panel reports the estimated results of controlling for the impact of family firms

VARIABLES	Ln (Patent+1) (1)	R&D Intensity (2)	Ln (R&D+1) (3)
CEO_*HI*	0.349***	0.085***	0.133***
	(7.527)	(2.718)	(3.759)
Family	-0.034	0.039	0.040
	(-0.491)	(0.802)	(0.805)
Constant	-8.147***	2.059***	-10.727***
	(-11.883)	(5.943)	(-19.265)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	17,079	17,079	17,079
R-squared	0.280	0.455	0.642

Panel D: Excluding Beijing, Shanghai, Guangzhou, and Shenzhen

This table reports the estimated results using subsample excluding Beijing, Shanghai, Guangzhou, and Shenzhen.

VARIABLES	Ln (Patent+1)	R&D Intensity	Ln(R&D+1)
	(1)	(2)	(3)
CEO_*HI*	0.384***	0.098***	0.136***
	(7.694)	(3.018)	(3.527)
Constant	-8.070***	1.908***	-10.852***
	(-10.821)	(4.894)	(-17.074)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	13,898	13,898	13,898
R-squared	0.285	0.445	0.637

Panel E: Controlling for the impact of founding CEOs

This panel reports the estimated results of controlling for the impact of founding CEOs.

VARIABLES	Ln (Patent+1)	R&D Intensity	Ln (R&D+1)
	(1)	(2)	(3)
CEO_*HI*	0.344***	0.082***	0.128***
	(7.402)	(2.591)	(3.633)
Founding CEO	0.114	0.129**	0.147***
	(1.335)	(2.032)	(2.904)
Constant	-8.256***	2.038***	-10.756***
	(-12.097)	(6.017)	(-19.629)
Controls	Y	Y	Y
Industry fixed	Y	Y	Y
Year fixed	Y	Y	Y
Observations	17,079	17,079	17,079
R-squared	0.280	0.456	0.643