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# CEO Tenure, Independent Directors and Corporate Innovation

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## Abstract

The separation of ownership and managerial control in public corporations increases the organizational implications of the CEO-Board relationship. Boards of Directors and CEOs play an integral role in shaping firm strategies; therefore, this study examines the effect of CEO tenure and the moderating influence of independent directors on corporate innovation. Using a data set of electronics firms listed on the Taiwan Stock Exchange Corporations, this study finds an inverted-U relationship between CEO tenure and corporate innovation (i.e., R&D intensity and patents), supporting the view that CEOs experience life cycles. Additionally, independent director ratio exerts a positive moderating influence on the relationship between CEO tenure and corporate innovation, supporting the view that independent directors influence managerial choices by monitoring effectively and providing important resources. The findings provide one important managerial implication that firms competing on innovation may consider giving considerable weight to the nomination of more independent directors to the board because independent directors may serve as effective guardians and resource providers to encourage CEOs to focus on innovation.

**JEL classification numbers:** O31, O32, G34.
**Keywords:** Innovation, R&D investment, Patents, CEO tenure, Independent directors.

## 1 Introduction

In today's business environment filled with rapid change, innovation is central to entrepreneurship action and, as such, it can sustain the competitive advantage and enhance the performance of many firms (Dalziel, Gentry & Bowerman, 2011). Many environmental and organizational factors influence a firm's commitment to innovation (Daellenbach, McCarthy & Schoenecker, 1999). Among the organizational factors, some

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studies suggest that the perceptual lens of the chief executive officer (CEO), an organization's central decision maker who has the greatest power to make critical investment and resource allocation decisions, have a significant impact on corporate innovation (Barker & Mueller, 2002; Wu, Levitas & Priem, 2005).

According to the upper-echelons perspective (Hambrick & Mason, 1984), CEOs act based on their understanding of the strategic situations they confront. This understanding is significantly shaped by their tenure (Souder, Simsek & Johnson, 2012), which mirrors their paradigms, skills, knowledge and cognition (Barker & Mueller, 2002). In light of this argument, a significant body of research links CEO tenure to innovation or research and development (R&D) spending, the primary source of innovation. However, the findings of such relationships are inconclusive. For instance, Naveen (2006) reports a negative association between CEO tenure and R&D spending, but Daellenbach, McCarthy and Schoenecker (1999) and Barker and Mueller (2002) find no significant direct effect for tenure. Lin, Lin, Song and Li (2011) find that CEO tenure is positively, but not significantly related to innovation (the likelihood of R&D investment and new product sales). The inconclusive findings lead this study to suspect the possibility of a nonlinear relationship between CEO tenure and corporate innovation.

Hambrick and Fukutomi (1991) suggest that new CEOs begin with a knowledge and power deficit and steadily learn while in their position, thereby expanding and refining their skill sets; however, in later stages of their tenure, CEOs tend to become insular and overly wedded to long-held paradigms, limiting adaptability. Hambrick and Fukutomi's theory implies that CEOs pass through two phases during their time in office: the first phase is an initial period of adaptive improvement, and in the second phase, CEOs become overly committed to existing approaches and tend to embrace the status quo (Henderson, Miller & Hambrick, 2006). Few papers have suggested that the influence of CEO tenure on firm inventiveness (Wu, Levitas & Priem, 2005) and firm internationalization (Jaw & Lin, 2009) is likely to follow the pattern of an inverted-U shape, but little or no research has examined an inverted-U relationship between CEO tenure and corporate innovation, particularly R&D investment. This study seeks to fill this research gap by investigating how a firm's innovation effort (R&D intensity) and innovation performance (the total number of patents) vary with the CEO life cycle pattern.

Although CEOs have an influence on their firms' innovation, some previously unexamined contingencies, such as governance factors, may affect the CEO life cycle. It is difficult for firms to develop effective R&D capabilities and produce innovation without effective guidance and sufficient resources (Dalziel, Gentry & Bowerman, 2011). Independent directors serve two important functions to organizations: monitoring and providing resources (Hillman & Dalziel, 2003); therefore, they may serve as guardians and resource providers for innovation (Kor, 2006). Agency theorists argue that independent directors are charged with the responsibility of monitoring managers to act in the best interests of shareholders (Jensen & Meckling, 1976; Kor, 2006) and of facilitating access to critical information and valuable resources (Chen, 2011). This study thus introduces independent directors as a potential moderator to investigate how CEOs and independent directors interact and what the implications for corporate innovation are.

Using a data set of 228 Taiwanese electronics firms, the results provide support for the CEO life cycle argument by showing an inverted-U relationship between CEO tenure and both R&D intensity and patents. The results also provide support for the agency theory perspective by indicating that independent director ratio positively moderates the CEO tenure-innovation relationship. The empirical evidence thus allows us to better understand

the more holistic construct of the innovation effect of CEO tenure by highlighting a nonlinear relationship and the important influence of independent directors on such relationship.

## 2 Theory and Hypotheses

### 2.1 The Curvilinear CEO Tenure–innovation Relationship

Investments in innovation are essential to survival, growth and long-run success for many firms in today's competitive environment. However, innovation is inherently risky due to a greater variability of outcomes and a greater probability of failure (Balkin, Markman & Gomez-Mejia, 2000). The extent to which gains from innovation can be captured depends on the firm's ability to orchestrate their innovation activities effectively (Lawson, Samson & Roden, 2012). Specifically, Wu, Levitas and Priem (2005) argue that CEO tenure plays a key role in allocating, organizing and motivating firm resources and capabilities, contributing greatly to inventive productivity. Accordingly, this study focuses on CEO tenure and discusses its effect on corporate innovation below.

During the initial phase of their tenure, CEOs tend to be hesitant to pursue risky innovation strategies for two major reasons. First, new CEOs have a relative lack of networks, experiences and knowledge about the firms and industries (Wu, Levitas & Priem, 2005), limiting their performance in effectively noticing, assessing and executing risks (Simsek, 2007). Second, new CEOs' power and discretion to undertake new initiatives are generally limited because they need to follow the mandate largely set by their boards to justify their selection for the job and gain acceptance within the firm (Souder, Simsek & Johnson, 2012).

Further into their tenure, CEOs are more likely to commit more resources to and accept more risk from innovation because they are better able to establish unity of purpose and synchronize actions (Souder, Simsek & Johnson, 2012) by solidifying their power (Brookman & Thistle, 2009), generating more experiences (Herrmann & Datta, 2006), building and capitalizing on their social capital, becoming familiar with the decision process and developing a wealth and depth knowledge of their jobs, firms and environments (Jaw & Lin, 2009).

However, as their time in the position continues past some intermediate point, CEOs tend to avoid risky and long-term innovation activities because they have a narrower set of information source and a relatively limited knowledge base resulting from their complacent with prior success, the belief of the possession of sufficient expertise and knowledge (Hambrick & Fukutomi, 1991; McClelland, Liang & Barker, 2010) and losing touch with their external environment (Miller, 1991).

In light of the arguments above, the specific hypothesis is as follows:

*Hypothesis 1: There will be an inverted U-shaped relationship between CEO tenure and corporate innovation.*

### 2.2 CEO Tenure, Independent Directors and Corporate Innovation

As discussed previously, new CEOs tend to invest less in innovation because they are less knowledgeable about organizational idiosyncrasies and the environments and have less power and fewer external linkages. Additionally, long-tenured CEOs are unlikely to

undertaken innovation activities because they tend to be risk averse and have restricted information sources and knowledge base.

From a perspective of agency theory, a board primarily consisting of independent directors is likely to be vigilant in making more exhaustive and profound evaluations of strategic decisions and management behavior (Luo, 2007). Osma (2008) suggests that independent directors are likely to question managerial decisions and efficiently constrain myopic R&D cuts. Accordingly, the incorporation of more independent directors to the board may facilitate and improve the monitoring of CEOs, ensuring they undertake risky, but profitable innovation activities.

In addition to monitoring, independent directors may facilitate access to valuable resources for innovation. Boards with a greater proportion of independent outside directors are more likely to be heterogeneous in terms of the background, skills and experiences of their members (Castro, De La Concha, Gravel & Perinan, 2009). Such boards deliver a broader range of perspectives, increase strategic repertoires, enhance access to information and resources, generate a wider variety of interpretations of the environments and produce a wider range of decision criteria and strategic alternatives (Kim, Burns & Prescott, 2009). All of these not only enable independent directors to effectively evaluate strategy implementation and provide better advice and counsel to CEOs, but also enhance CEOs' capabilities in gaining insight into unique strategic opportunities in the environments and in collecting and organizing resources effectively and efficiently for innovation. Osma (2008) suggests that independent directors have sufficient technical knowledge. With the help from independent directors, CEOs increase their willingness to invest more in innovation.

Based on the above arguments, this paper proposes the following hypothesis:

*Hypothesis 2: Independent director ratio will positively moderate the inverted-U relationship between CEO tenure and corporate innovation.*

# 3 Method

## 3.1 Sample and Analysis

To test the hypotheses, this study focuses on electronics firms listed on the Taiwan Stock Exchange Corporations during the period 2006–2009. The Taiwanese context is well suited for this study for three major reasons. First, Taiwan is noted for IT products. To stay internationally competitive, Taiwanese firms need to continuously focus on innovation. The electronics industry is particularly chosen because of its dependence on R&D investment and innovation for competitive advantage and long-run success (Chen & Huang, 2006). Second, Taiwanese firms operate in the context of a high power distance culture. Therefore, most of the decision-making activities are centralized in the hands of CEOs. Third, owing to the lack of external markets for corporate control in Taiwan, the role of independent directors is particularly important.

To mitigate potential endogeneity (Chen, Huang & Chen, 2009) and allow for the desires and efforts of CEOs and directors to thoroughly affect the operations of the firm (Ahuja, 2000; Wu, Levitas & Priem, 2005), the dependent variables (from 2007-2009) are regressed against independent variable, moderator and control variables (from 2006-2008). The final sample includes 228 companies and generates 519 observations.

The financial data (including R&D expenditures, total sales, the number of employees,

return on assets and debt ratio), the number of independent directors, board size, the established date and institutional ownership are taken from the Taiwan Economic Journal (TEJ) Data Bank. Data on CEO ownership are manually drawn from the TEJ Data Bank and are checked against and supplemented by companies' annual reports.

### 3.2 Measures

The innovation measure is the dependent variable in the analysis. Lin, Lin, Song and Li (2011) argue that the best way to assess corporate innovation is to make a distinction between innovation input and innovation output. Accordingly, this study uses R&D intensity, measured as the ratio of R&D expenditures to total sales, for innovation effort (Lin, Lin, Song & Li, 2011) and the number of patents granted for innovation performance (Balkin, Markman & Gomez-Mejia, 2000; Wu, Levitas & Priem, 2005).

The independent variable is CEO tenure, measured as the total number of years since being appointed CEO (Wu, Levitas & Priem, 2005). This study also calculates and includes the square of tenure.

Independent director ratio serves as the moderator in the analysis and is calculated as the proportion of independent directors on the company's board (Chen & Hsu, 2009).

To control for firm, governance and ownership effects on corporate innovation, this study includes a series of control variables. Firm size is measured as the logarithm of the number of employees (Barker & Mueller, 2002). Firm performance is measured as return on assets (Lin, Lin, Song & Li, 2011). Leverage is measured as the ratio of total debt to total assets (Dalziel, Gentry & Bowerman, 2011). Firm age is measured as the logarithm of the number of years a firm has been in existence (Wu, Levitas & Priem, 2005). Institutional ownership is measured as the ratio of shares held by institutions to total shares outstanding (Fong, 2010). CEO ownership is calculated as the ratio of shares held by the CEO divided by the total shares outstanding (Barker & Mueller, 2002).

## 4 Data Analysis and Results

Table 1 presents the descriptive statistics. On average, the R&D intensity is 4.77%. The number of patents is 164.15. CEOs have been employed in the position for 9.43 years on average.

Table 1: Means and Standard Deviations

| Variables | Mean | S. D. |
|---|---|---|
| 1. R&D intensity (%) | 4.77 | 5.12 |
| 2. Patents | 164.15 | 481.21 |
| 3. CEO tenure (year) | 9.43 | 8.16 |
| 4. CEO tenure square | 155.27 | 233.93 |
| 5. Independent director ratio | 0.17 | 0.16 |
| 6. CEO ownership (%) | 4.38 | 6.37 |
| 7. Firm size (log) | 3.38 | 0.66 |
| 8. Firm performance (%) | 10.81 | 8.93 |
| 9. Leverage (%) | 39.00 | 15.71 |
| 10. Institutional ownership (%) | 40.19 | 22.23 |
| 11. Firm age (log) | 1.30 | 0.18 |

Notes: Number of observations = 519.

Table 2 presents the Pearson correlation matrix and shows the modest correlations between independent variables, suggesting that multicollinearity problems are unlikely. To further test for multicollinearity, the variance inflation factors (VIFs) are calculated for each independent variable. The VIFs of 1.07-1.80 are strictly less than 2, suggesting that the regression models are relatively free from potential multicollinearity problems.

Table 2: Pearson Correlations

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. R&D intensity (%) | -- | | | | | | | | | |
| 2. Patents | -0.01 | -- | | | | | | | | |
| 3. CEO tenure (year) | -0.05 | 0.10** | -- | | | | | | | |
| 4. CEO tenure square | -0.07 | 0.08 | 0.94*** | -- | | | | | | |
| 5. Independent director ratio | 0.02 | -0.07 | -0.16*** | -0.13*** | -- | | | | | |
| 6. CEO ownership (%) | -0.01 | 0.11** | 0.23*** | 0.21*** | 0.02 | -- | | | | |
| 7. Firm size (log) | -0.34*** | 0.20*** | 0.03 | -0.00 | -0.06 | -0.03 | -- | | | |
| 8.Firm performance (%) | 0.10** | 0.15*** | 0.00 | -0.02 | 0.13*** | 0.09** | 0.03 | -- | | |
| 9. Leverage (%) | -0.51*** | -0.02 | -0.09** | -0.07 | 0.03 | -0.08 | 0.45*** | -0.31*** | -- | |
| 10. Institutional ownership (%) | -0.07 | 0.19*** | -0.13*** | -0.16*** | 0.13*** | 0.03 | 0.40*** | 0.40*** | 0.05 | -- |
| 11. Firm age (log) | -0.24*** | 0.02 | 0.26*** | 0.27*** | -0.29*** | -0.02 | 0.26*** | -0.24*** | 0.15*** | -0.22*** |

Notes: ***, **, * stand for significance within respectively the 1%, 5% and 10% level. Number of observations = 519.

Table 3 summarizes the lagged hierarchical OLS regression analysis for R&D intensity (innovation effort). Model 1 includes the control variables (CEO ownership, firm size, firm performance, leverage, institutional ownership, firm age and year effect) and shows that the control variables explain 29.41 percent of the variance in R&D intensity. Model 2 includes the effects of CEO tenure and CEO tenure square in addition to the control variables and indicates an invested-U relationship between CEO tenure and R&D intensity ($t = -1.72$, $p < 0.1$). To examine the influence of independent directors on the CEO tenure-R&D intensity relationship, the study includes a moderated multiple regression. To avoid the problem of multicollinearity between the predictor variables and the interaction terms, the CEO tenure and independent director ratio are centered by their means (Aiken & West, 1991). The results presented in Model 3 show a positive interaction effect of CEO tenure and independent director ratio ($t = 2.11$, $p < 0.05$) on R&D intensity.

Table 3: OLS Regression-CEO Tenure, Independent Directors and R&D Intensity (Innovation Effort)

| Variable | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| Intercept | 19.53*** | 18.96*** | 19.49*** |
| | (12.01) | (11.51) | (11.18) |
| **Control Variables** | | | |
| CEO ownership | -0.03 | -0.03 | -0.03 |
| | (-1.16) | (-0.92) | (-0.90) |
| Firm size | -0.60 | -0.65 | -0.57 |
| | (-1.60) | (-1.72) | (-1.51) |
| Firm performance | -0.04 | -0.03 | -0.04 |
| | (-1.40) | (-1.35) | (-1.50) |
| Leverage | -0.15*** | -0.15*** | -0.16*** |
| | (-10.47) | (-10.36) | (-10.53) |
| Institutional ownership | -0.01 | -0.01 | -0.01 |
| | (-0.54) | (-0.70) | (-0.53) |
| Firm age | -4.95*** | -4.50*** | -4.95*** |
| | (-4.28) | (-3.78) | (-4.02) |
| Year effect | Included | Included | Included |
| **Main Effects** | | | |
| CEO tenure | | 0.09 | 0.09 |
| | | (1.23) | (1.22) |
| CEO tenure square | | -0.00* | -0.00 |
| | | (-1.72) | (-1.63) |
| Independent director ratio | | | -0.26 |
| | | | (-0.22) |
| **Moderated Effects** | | | |
| CEO tenure × Independent director ratio | | | 0.30** |
| | | | (2.11) |
| Adjusted $R^2$ (%) | 29.41 | 29.70 | 30.04 |
| F-statistics | 27.98*** | 22.89*** | 19.54*** |

Notes: ***, **, * stand for significance within respectively the 1%, 5% and 10% level. Number of observations = 519.

Table 4 summarizes the lagged hierarchical Poisson regression analysis for patents (innovation performance). Model 2 indicates an invested-U relationship between CEO tenure and patents ($t = -5.46$, $p < 0.001$). In terms of the moderating influence of independent directors, Model 3 shows a positive interaction effect of CEO tenure and independent director ratio ($t = 3.14$, $p < 0.01$) on patents.

Table 4: Poisson Regression Results-CEO Tenure, Independent Directors and Patents (Innovation Performance)

| Variable | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| Intercept | 1.64*** | 1.91*** | 2.40*** |
| | (51.74) | (58.79) | (70.13) |
| **Control Variables** | | | |
| CEO ownership | 0.03*** | 0.02*** | 0.02*** |
| | (65.31) | (44.58) | (52.76) |
| Firm size | 0.68*** | 0.65*** | 0.64*** |
| | (101.47) | (96.08) | (94.23) |
| Firm performance | 0.03*** | 0.03*** | 0.03*** |
| | (72.64) | (65.35) | (70.50) |
| Leverage | -0.01*** | -0.01*** | -0.01*** |
| | (-38.54) | (-31.58) | (-22.92) |
| Institutional ownership | 0.01*** | 0.01*** | 0.01*** |
| | (34.24) | (48.02) | (49.43) |
| Firm age | 0.40*** | -0.09*** | -0.34*** |
| | (17.60) | (-3.84) | (-13.70) |
| Year effect | Included | Included | Included |
| **Main Effects** | | | |
| CEO tenure | | 0.04*** | 0.03*** |
| | | (31.35) | (21.02) |
| CEO tenure square | | -0.00*** | 0.00 |
| | | (-5.46) | (0.75) |
| Independent director ratio | | | -1.42*** |
| | | | (-58.47) |
| **Moderated Effects** | | | |
| CEO tenure × Independent director ratio | | | 0.01*** |
| | | | (3.14) |
| Model Likelihood | -110739.50 | -107899.30 | -106067.90 |
| LR Statistics | 49818.04*** | 55498.54*** | 59161.15*** |

Notes: ***, **, * stand for significance within respectively the 1%, 5% and 10% level. Number of observations = 519.

## 5 Discussion

The theoretical arguments and empirical findings reveal the following: (1) an inverted U-shaped relationship between CEO tenure and both R&D intensity and patents, which is consistent with previous life cycle hypotheses (Hambrick & Fukutomi, 1991; Miller & Shamsie, 2001) and with findings regarding the influence of CEO tenure on firm inventiveness (Wu, Levitas & Priem, 2005) and firm internationalization (Jaw & Lin, 2009); (2) the positive moderating effect of independent director ratio on the CEO tenure-innovation relationship, which is based on the agency theory logic that independent directors can question, assess, inform and influence managers' decisions as well as provide valuable information and critical resources (Chen, 2011).

This study should add new insights to the existing literature in two ways. First, given the findings of the relationship between CEO tenure and innovation or R&D investment are inconclusive, this study argues and tests a nonlinear tenure-innovation hypothesis. Similar CEO life cycle hypotheses have been offered for CEO tenure and firm performance

(Hambrick & Fukutomi, 1991; Miller & Shamsie, 2001), firm inventive productivity (Wu, Levitas & Priem, 2005) and firm internationalization (Jaw & Lin, 2009), but little or no research has reported how innovation (particularly R&D investment) varies with the CEO life cycle. The findings of an inverted U-shaped relationship between CEO tenure and both innovation effort (R&D intensity) and innovation performance (patents) should expand our understanding of the more holistic construct of the CEO tenure-innovation relationship.

Second, this study introduces independent director ratio as an additional variable that are necessary for a more complete understanding of how a firm's strategic decisions toward innovation are made by its corporate leaders. Board directors and CEOs play an integral role in choosing firm strategies; therefore, they are responsible for resource allocation, performance and increasing shareholder wealth (Minnick & Noga, 2010). Accordingly, the relationship between CEO tenure and corporate innovation cannot be interpreted accurately without considering the influence of board directors. By addressing the issue regarding how independent directors monitor CEOs and facilitate access to essential resources for innovation, this study extends our knowledge as to how CEOs and their boards interact and what the implications for organizational outcomes are.

This study also provides two major implications for CEOs and board directors in electronics firms and other firms competing on innovation. The findings that CEOs early or late in their tenures tend to invest less in innovation suggest that CEOs should be aware of their tenure and how it may affect their innovation decisions. CEOs, particularly those who are late in their tenures, tend to avoid high risk and have limited information and knowledge about environmental opportunities and directions for growth as they lose touch with their external environment; all of these may lead to negligence on the part of the CEO with respect to innovation. Accordingly, over time in their position, CEOs must remind themselves not to neglect the importance of innovation because of those tendencies associated with their long tenures.

The inverted-U shaped tenure-R&D relationship also implies that boards may need to be particularly vigilant regarding innovation activities for CEOs both early and late in the tenure of the CEOs. The finding with respect to the moderating effect of independent director ratio further suggests that independent directors may act as guardians and resource providers to encourage CEOs to focus on innovation that benefits a firm's long-term success and shareholder interests. Because independent directors could alleviate the negative influence of CEO tenure on innovation, shareholders, in their selection of board members, must consider nominating more independent directors to the board.

This study recognizes that the findings in this paper are subject to some limitations and thus suggest directions for future research. First, this study investigates only one industry, that is, the electronics industry. Studying a single industry helps to control for industry effects (Ahuja, 2000) but limits the possibility of generalizing the findings to other industries. Similar studies in other industries should be encouraged to confirm the boundaries of the theory in this research. Second, in keeping with much of the board literature, this study focuses on board independence to examine its effect on the relationship between CEO tenure and corporate innovation. Kor and Sundaramurthy (2009) recognize that a gap may exist between what independent directors are expected to achieve and the knowledge, skills and information they possess. Therefore, future studies can be enriched if researchers could investigate the effect of independent directors' experience, knowledge and relational capital on the CEO tenure-innovation relationship.

## References


[1] Ahuja, G. Collaboration networks, structural holes and innovation: A longitudinal study. *Administrative Science Quarterly*, **45**, (2000), 425-455.

[2] Aiken, L. S. and West, S. G. *Multiple regression: Testing and interpreting interactions*. Sage, Newbury Park, 1991.

[3] Balkin, D. B., Markman, G. D. and Gomez-Mejia, L. R. Is CEO pay in high-technology firms related to innovation? *Academy of Management Journal*, **43**(6), (2000), 1118-1129.

[4] Barker III, V. L. and Mueller, G. C. CEO characteristics and firm R&D spending. *Management Science*, **48**, (2002), 782-801.

[5] Brookman, J. and Thistle, P. D. CEO tenure, the risk of termination and firm value. *Journal of Corporate Finance*, **15**, (2009), 331-344.

[6] Castro, C. B., De La Concha, M. D., Gravel, J. V. and Perinan, M. M. V. Does the team leverage the board's decisions? *Corporate Governance: An International Review*, **17**(6), (2009), 744-761.

[7] Chen. H.-L. Does board independence influence the top management team? Evidence from strategic decisions toward internationalization. *Corporate Governance: An International Review*, **19**(4), (2011), 334-350.

[8] Chen, H.-L. and Hsu, W.-T. Family ownership, board independence and R&D investment. *Family Business Review*, **22**(4), (2009), 347-362.

[9] Chen, H.-L. and Huang, Y.-S. Employee stock ownership and corporate R&D expenditures: Evidence from Taiwan's information-technology industry. *Asia Pacific Journal of Management*, **23**, (2006), 369-384.

[10] Chen, Y.-U., Huang, Y.-L. and Chen, C.-N. Financing constrains, ownership control and cross-border M&As: Evidence from nine East Asian economies. *Corporate Governance: An International Review*, **17**(6), (2009), 665-680.

[11] Daellenbach, U. D., McCarthy, A. M. and Schoenecker, T. S. Commitment to innovation: The impact of top management team characteristics. *R&D Management*, **29**(3), (1999), 199-208.

[12] Dalziel, T., Gentry, R. J. and Bowerman, M. An integrated agency-resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, **48**(6), (2011), 1217-1242.

[13] Fong, E. A. Relative CEO underpayment and CEO behaviour towards R&D spending. *Journal of Management Studies*, **47**(6), (2010), 1095-1122.

[14] Hambrick, D. C. and Fukutomi, G. D. S. The seasons of a CEO's tenure. *Academy of Management Review*, **16**, (1991), 719-742.

[15] Hambrick, D. C. and Mason, P. A. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, **9**, (1984), 193-206.

[16] Henderson, A. D., Miller, D. and Hambrick, D. C. How quickly do CEOs become obsolete industry dynamism, CEO tenure and company performance? *Strategic Management Journal*, **24**, (2006), 447-460.

[17] Herrmann, P. and Datta, D. K. CEO experiences: Effects on the choice of FDI entry mode. *Journal of Management Studies*, **43**(4), (2006), 755-778.

[18] Hillman, A. J. and Dalziel, T. Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, **28**(3), (2003), 383-396.

[19] Jaw, Y.-L. and Lin, W.-T. Corporate elite characteristics and firm's

internationalization: CEO-level and TMT-level roles. *The International Journal of Human Resource Management*, **20**(1), (2009), 220-233.
[20] Jensen, M. C. and Meckling, W. H. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, **3**, (1976), 305-360.
[21] Kim, B., Burns, M. L. and Prescott, J. E. The strategic role of the Board: The impact of board structure on top management team strategic action capability. *Corporate Governance: An International Review*, **17**(6), (2009), 728-743.
[22] Kor, Y. Y. Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, **27**(11), (2006), 1081-1110.
[23] Kor, Y. Y. & Sundaramurthy, C. Experienced-based human capital and social capital of outside directors. *Journal of Management*, **35**(4), (2009), 981-1006.
[24] Lawson, B., Samson, D. and Roden, S. Appropriating the value from innovation: inimitability and the effectiveness of isolating mechanisms. *R&D Management*, **42**(5), (2012), 420-434.
[25] Lin, C., Lin, P., Song, F. M. and Li, C. Managerial incentives, CEO characteristics and corporate innovation in China's private sector. *Journal of Comparative Economics*, **39**, (2011), 176-190.
[26] Luo, Y. 2007. *Global Dimensions of Corporate Governance*. Malden, MA: Blackwell.
[27] McClelland, P. L., Liang, X. and Barker, V. L. CEO commitment to the status quo: Replication and extension using content analysis. *Journal of Management*, **36**(5), (2010), 1251-1277.
[28] Miller, D. Stale in the saddle: CEO tenure and the match between organization and environment. *Management Science*, **37**, (1991), 34-52.
[29] Miller, D. and Shamsie, J. Learning across the life cycle: Experimentation and performance among the Hollywood studio heads. *Strategic Management Journal*, **22**, (2001), 725-745.
[30] Minnick, K. and Noga, T. Do corporate governance characteristics influence tax management? *Journal of Corporate Finance*, **16**(5), (2010), 703-718.
[31] Naveen, L. Organizational complexity and succession planning. *Journal of Financial and Quantitative Analysis*, **41**(3), (2006), 661-683.
[32] Osma, B. G. Board independence and real earnings management: The case of R&D expenditures. *Corporate Governance: An International Review*, **16**(2), (2008), 116-131.
[33] Simsek, Z. CEO tenure and organizational performance: An intervening model. *Strategic Management Journal*, **28**, (2007), 653-662.
[34] Souder, D., Simsek, Z. and Johnson, S. G. The differing effects of agent and founder CEOs on the firm's market expansion. *Strategic Management Journal*, **33**, (2012), 23-41.
[35] Wu, S., Levitas, E. and Priem, R. L. CEO tenure and company invention under differing levels of technological dynamism. *Academy of Management Journal*, **48**(5), (2005), 859-873.