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FAMILY FIRM INNOVATION: TENSIONS AND MINDSETS



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ABSTRACT

Innovation plays a central role in firm performance and survival. Until recently, limited attention has been given to the enablers of innovation in family firms. Utilizing structural equation modeling, this study develops and tests a model of family firm innovation, exploring relationships between mindsets and innate tensions that can fuel or inhibit innovative behavior. The findings explicate drivers of innovation, highlighting the existence of tensions and the importance of leadership embracing paradoxical thinking.

INTRODUCTION

Family firms are a key driver of the US economy (e.g., Astrachan & Shanker, 2003; Hatum, 2007). Regardless, until recently, scant attention has been given to enablers of family business performance. For instance, organization theorists have long stressed the importance of innovation for profitability and sustainability (e.g., Cordozo, McLaughlin, Harmon, Reynolds, & Miller, 1993; Frambach & Schillewaert, 2002), yet little is known about what fosters or hinders family firm innovation. Additionally, scholars note that family businesses are imbued with tensions (e.g., Danes, 1999; Ward, 2005), which can foster negative outcomes (e.g., Danes, Rueter, Kwon & Doherty, 2002; Harvey & Evans, 1994), or energize high performance (e.g., Danes, Zuiker, Kean, & Arbuthnot, 1999; Ward, 1997). Tapping insights from organizational innovation and paradox literature, this study aims to address the question: how might family firms cope with inherent tensions to fuel innovation?

Literature Review and Hypotheses Development

Managing both innovation and tensions is vital for family businesses. Innovation is critical in today's turbulent markets, but the paradoxical demands of innovation challenge firms. Indeed, Morgan (1977) argued that managing organizational change, hence innovation, requires organizations to deal with paradoxical, "contradictory tensions". Extant literature is replete with exemplars positing that innovation encompasses paradoxical goals and practices (e.g., Andriopoulos & Lewis, 2008; March, 1991; Sheremata, 2000; Taylor & Greve, 2006). Indeed, firms must explore new ideas and domains, while simultaneously exploiting existing products and competencies (Gupta, Smith & Shalley, 2006). March (1991) asserted that exploration and exploitation, alternative modes of innovation, are synergistic yet entail contradictory logics.

Scholars warn against mismanaging innovation, as focusing solely on exploration or exploitation can prove counterproductive (Tushman & O'Reilly, 1996). Gupta and colleagues (2006) described the dangers of myopia as failure and success traps. Failure traps stem from single-minded exploration, whereby risks are increasingly taken to overcome past mistakes. In contrast,

success traps arise from overemphasizing exploitation, honing core competencies to the neglect of building new capabilities and identifying novel opportunities (Taylor & Greve, 2006).

Until recently, few innovation studies examined the context of family business, yet exceptions do exist (e.g., Poza, 2007; Zahara, Hayton, & Salvato, 2004; Zahara, Hayton, Neubaum, & Dibrell, 2008). McCann, Leon-Guerrero and Haley (2001), for instance, found that “innovative” family firms’ stress the development of new products in their mission and vision, helping ensure that strategic planning supports innovative efforts. Further, Litz and Kleyesen (2001) suggested that successful family firms exhibit domain relevant skills, creativity, intrinsic task motivation, and macro cultures that support innovation. Additionally, family business studies have focused on ownership structure, governance and innovation (Block, 2012; Czarnitzki & Kraft, 2009; Chin, Chen, Kleinman, & Lee, 2009; Gudmundson, Tower & Hartman, 2003), owner identity and innovation (Munari, Oriani & Sobrero), and resources and innovation (Llach & Nordqvist, 2010). However, the majority of these studies focused on R&D or an innovation outcome. In addition to an emerging interest in family firm innovation focusing on outputs of innovation, researchers are calling for a process oriented approach to understanding innovation. A processual focus emphasizes how innovations emerge, develop and are implemented, embracing the dynamic, complex conditions that determine innovation (Van de Ven & Angle, 1989; Van de Ven & Rogers, 1988).

Although, a myriad of foci and definitions existing for organizational innovation, this study focuses on innovation in terms of process including novelty of ideas, practices, processes and products. Therefore, innovation includes the generation, adoption and diffusions of innovation. Hence, innovation goes beyond the actual physical output of a new product or technology, but encompasses the process of creation. Moreover, for purposes of this study, innovative behavior entails the actual generations of new ideas, the actual promotion and ideas and the actual realizations of those ideas (e.g., Kanter, 1988; Scott & Bruce, 1984).

In addition to managing innovation, however, family businesses must cope with broader tensions. Indeed, scholars assert that family firms are a paradox, replete with contradictory yet complementary goals, values and ideologies (e.g., Tapies & Ward, 2008; Ward, 2005). Certain tensions are often noted, such as business growth vs. family liquidity, tradition vs. change, inward vs. outward thinking, and emotion vs. rationality (e.g., Poza, 2008; Ward, 1997). Zahara and colleagues (2008) discussed tensions of individual-collective, exploration-exploitation, and short term-long term orientation. Garcia-Elvarez, Lopez-Sintax and Gonzalvo (2002) depicted the ‘founders dependence’ paradox, as founders ironically remain in the business because of their successors.

Inherent tensions of family business may energize or stymie innovation. Poza (2007) suggested that such firms struggle to adapt to a dynamic environment, while simultaneously maintaining core values and traditions. Ward (2005) warned that family firms may fall into the “strategic simplicity” trap, avoiding the tradition-change paradox and clinging to what has worked before even when changes are needed. Interestingly, Zahara and colleagues (2008) proposed that, initially, the founding generation is highly creative and risk taking yet over time reliance on their early ideas and engrained ideology stymies ongoing innovation.

Cognition may play a critical role in managing the dual challenge of innovation and family business tensions. Studies propose that actors must leverage innovation tensions via alternate

mindsets (e.g., Cameron, 1986; Norman, Palich, Livingston & Carini, 2004; Wright, 1982). Many scholars have argued that cognition plays an integral role in fueling firm innovation (e.g. Damanpour & Schneider, 2006; Howells, 1994; Yadav, Prabhu & Chandy, 2007). The strategy literature is replete with discussion of the importance of top managers' cognitions impacting a firm's strategic behavior and outcomes (Stubbart, 1989). Indeed, "Organizational outcomes- both strategies and effectiveness- are viewed as reflections of the values and cognitive bases of powerful actors" (Hambrick & Mason, 1984; 193). Moreover, executive cognition is imperative to innovation because executives' cognitive frames enable or detour firms from championing ideas, directing and allocating resources, and creating a supportive culture. Managerial cognition supports strategic action because executives deploy support and resources that are consistent with their mental frames (e.g., Daft & Weick, 1984; Dutton, Fahey & Narayanan, 1983). Hence, the dominant mindsets and logics of top management foster mental models that guide strategic decision making and enable action (Bettis & Prahalad, 1995).

Scholars have discussed actors' ability to think paradoxically, as key in managing innovation tensions (e.g. Carini, 2004; He & Wong, 2004; Smith & Tushman, 2005). The term "paradoxical thinking" has been coined to denote the ability to embrace contradictory ideas, practices, and goals in search of creative synergies. Indeed, March (1991) claimed that innovation stems from the ability to apply the contradictory logics of exploration and exploitation simultaneously. Similarly, according to Smith and Tushman (2005), paradoxical cognition enables top managers to frame exploration and exploitation as complementary and guide strategic decision making accordingly. Ingram, Lewis, Andriopoulos and Gotsi (2007) further demonstrated how actors in highly creative firms value tensions as fuel for innovation.

In sum, family firms face the dual challenges of needing to manage innovation and family business tensions. Paradoxical thinking, however, may enable the positive potential of tensions. More specifically, this study will test the following proposition: how the interplay of family business tensions and paradoxical thinking influences firm innovation (Figure 1). Therefore, this study proposes:

H1: The higher the level of paradoxical tensions family firm members' experience, the lower the level of innovation.

H2: Family firm leaders' paradoxical thinking is positively related to innovative behavior.

H3: Family firm leaders' paradoxical thinking moderates the relationship between tensions and innovative behavior.

METHODS

Research Design

This study examines how inherent tensions and mindsets may impact family firm innovation. To test these relationships, a four-stage field study design was utilized. Given the limited empirical research on family business innovation, the early stages focused on scale development and validation. The first stage entailed initial scale creation, building from existing work wherever possible. The second stage involved conceptual refinement of the measurement scales. During this stage,

an expert panel of content and lay experts assessed the measures based on representativeness of the content domain, clarity of items, factor structure, and comprehensiveness. During the third stage a pilot study was conducted, using confirmatory factor analysis (CFA) to assess the overall construct validity and reliability. During the final stage, an online questionnaire was administered and analyzed using multiple statistical methods including structural equation modeling (SEM) and multivariate analysis.

Scale Development

This research design sought to achieve two, interwoven goals: to create and validate measures pertinent to family firm innovation and to test hypothesized relationships. Scale development followed a deductive approach, leveraging extant theory and recommended guidelines (e.g., Anderson & Gerbing, 1988; Churchill & Peter, 1984; Hinkin, 1995; 2005). In designing measures, strategies were employed to reduce response (i.e. social desirability, acquiescence) and measurement (common method) biases. For example, wording was carefully chosen to reduce response bias and different scale endpoints were utilized for the independent (IV) and dependent variables (DV) to reduce common method bias (Podsakoff et al., 2003).

Initial survey items were revised based upon feedback from an expert panel consisting of three academic experts and three lay experts as recommended by scholars (e.g., Rubio, Berg-Weger, Tebb, Lee & Rauch, 2003). Experts were asked to rank each scale item for clarity and representativeness using a four point Likert-scale. Further, to assess the factor structure, experts were provided with a list of the constructs and asked to match each scale item to a construct. Finally, the panelists were asked to assess the entire survey and recommend any items they feel should be deleted. Items were then revised or removed accordingly. The remaining questionnaire was subjected to a pilot study of 63 family business executives from 19 firms. Confirmatory factor analysis (CFA) was conducted to validate the psychometric properties of the measures.

Sample

To assess the developed measures and test the hypotheses, data were collected via an online survey of family firm executives. The sample evolved using a snowball sampling technique, and initial respondents shared the survey with other family firm executives. E-mails requesting participation were originally sent to respondents recruited from a family business center located at a major urban research university in the United States. Overall, 178 family business executives completed the survey; however due to aggregation issues, only 113 were included in the analysis, representing one executive from each firm that responded. Profile data showed that the responding executives were 83% male, 30% second generation, followed closely by first generation (28%), had an average tenure of 22 years, 89% were related to the founders, and most were CEOs (32%), presidents (26%) or vice presidents (10%). The average family firm size was 357 employees.

Measures

The final survey consisted of 17 items within three categories: mindsets, tensions and innovative behavior. The mindset category includes paradoxical thinking, while the tensions category is represented by the level of tensions actors experience in their firm. Lastly, innovative behavior constitutes the dependent variable. The following are descriptions of each variable measured in

this study. All items were assessed on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) unless otherwise noted.

Independent Variables

Tensions (Tens)

Tensions (Tens) are the degree of perceived tensions that exist within the organization. Six items were created to measure the level of tensions firm members experience (Alpha=.84). The five point Likert-type scale ranges from strongly disagree; no tension (1) to strongly agree; a great deal of tension (5). An illustrative item is “there are pressures to explore new ways of doing things, while embracing company traditions.”

Paradoxical Thinking (PT)

Paradoxical thinking (PT) signifies the ability to mentally juxtapose contradictory but inter-related ideas simultaneously. There are no established measures of paradoxical thinking and thus, a new scale was constructed. Paradoxical thinking was assessed with three items (Alpha=.81). The five point Likert-type scale response range from strongly disagree; does not make sense (1) to strongly agree; makes perfect sense (5). A representative item is “it is possible to maintain and develop our core competencies, while simultaneously creating new innovations.”

Dependent Variable

Innovative Behavior (IB)

Innovative behavior (IB) includes idea generation, idea promotion, and idea realization (Scott & Bruce, 1984). Innovative behavior is measured with eight items adapted from Janssen’s (2000, 2001) scale of individual innovation (Alpha=.85). This scale draws from Kanter’s (1988) stages of innovation, which was further developed by Scott and Bruce (1994). The first three items correspond to idea generation, the next three represent idea promotion, and the final three refer to idea realization. The five point Likert-scale ranges from never (1) to always (5). A representative statement is that this family firm “mobilizes support for innovative ideas.”

Control Variables

Scholars have argued that firm age, firm size and industry may significantly impact a firm’s innovative behavior. Therefore, this study controlled for firm age (number of years in operation), firm size (number of employees) and the primary reported industry (dichotomous variable-Manuf & Service). For example, firm age has been shown to both positively and negatively impact firm innovation (Kimberly & Evanisko, 1981; Roa & Drazin, 2000; Scott & Bruce, 1994). Likewise, scholars have suggested that firm size impacts its innovative behavior (e.g., Ahuja, 2000; Ancona & Caldwell, 1982; Greve & Taylor, 2000), yet findings show size as both an advantage and a disadvantage (Camison-Zornoza, Lapiedra-Alcami, Segarra-Cipres & Bornonat-Navarro, 2004). Some have suggested that the larger an organization the more inert it becomes (e.g. Greve & Taylor, 2000; Roa & Drazin, 2000; Scott & Bruce, 1994), while others have argued that large firms accrue more resources (Damanpour & Evan, 1984) and are able to take greater risks (Damanpour, 1992) to fuel

innovation. Industry is also an important control variable to gauge whether different industry norms, practices and environments may impact innovation. Illustratively, industries with higher levels of environmental uncertainty may engage in greater innovation efforts (Damanpour, 1996).

Measurement and Path Analyses

Following Anderson and Gerbings's (1988) guidelines, a two-step procedure of analysis was followed. First a series of CFA's were conducted in AMOS 18.0 to evaluate the properties of the latent constructs and their reliability and validity. Second, structural path analysis was conducted to test the aforementioned hypotheses. Before conducting either the CFA's or structural analyses, the data were examined for normality, outliers, homoscedasticity, and missing data (Kline, 2005). Overall, 16.2% of the data were missing. To determine if data were missing completely at random (MCAR) or missing at random (MAR), SPSS 18.0 Missing Value Analysis (MVA) was utilized to analyze the data for discernable patterns. As indicated by MVA, Little's MCAR, there were no detectable patterns. Little's MCAR was non-significant ($p=.769$, Chi-Square 605.684) indicating the data are missing completely at random. Lastly, the characteristic of missing data for each variable was examined and the range of missing data were from 2.6%-16.2%. Finally, multiple imputation in SPSS 18.0 was utilized to impute the missing values since the data were MCAR.

Another quintessential assumption of SEM is that the data follow a multivariate normal distribution (Byrne, 2001); therefore, the data were examined for normality by assessing skewness and kurtosis for each scale item in AMOS 18.0. Normality was examined by AMOS 18.0 skewness and kurtosis critical ratios and Mardias (1970) coefficient estimating multivariate kurtosis. The majority of items demonstrated non-normality because the skewness and kurtosis critical ratio (CR) was greater than 2.0 or smaller than -2.0. Further, Maridia's coefficient estimates multivariate kurtosis showed that the data were overall non-normal with a coefficient greater than 10.

To respond to the violations of normality and sample size limitations, scholars recommend utilizing bootstrapping. Bootstrapping serves as a beneficial technique for addressing situations in which sample sizes are small and data are not normally distributed (Byrne, 2001; Yung & Bentler, 1996). Bootstrapping resamples cases from observed data to estimate the population distribution of a given statistic. Therefore, many new datasets are created by re-sampling the original data set. To account for non-normality, the bias corrected approach to interval estimation in AMOS 18.0 was utilized where the .95 corrected confidence intervals and the Bollen Stine p value test for overall model fit with non-normal data were estimated and examined.

After assessment of the key assumptions of SEM, model assessment was conducted in two categories: measures of overall model fit and measures of the individual model parameters. Individual model parameters were assessed by the following criteria. First, items should have a factor loading of $>.3$ (Hair et al., 2006) and be statistically significant ($<.05$), indicating that the item represents the latent construct. AMOS 18.0 reports critical values, equivalent to z test statistics equating a critical ratio of 1.96 equivalent to the significance level ($p=.05$) and critical ratio equal or greater than 2.56 equivalent to the significance level ($p=.01$). Second, standardized residuals should be between 2.58 and -2.58 (Byrne, 2001). Third, bootstrap corrected confidence intervals should not include zero, which indicates non-significance (Byrne, 2001). Additionally, scholars recommend that for a construct to display sufficient convergent validity, the average variance extracted should be $>.50$ (Hair et al., 2006).

In addition to assessing the individual parameters, the overall fit of the model was assessed using multiple indices (Bollen & Long, 1993). Although there are a variety of fit indices, no “golden rules” exist to determine the most suitable index (Hooper et al., 2008). Indices of absolute and relative fit were included, consisting of the traditional Chi-Square test of model fit, the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Bollen Stine Index to correct for limited sample size. Hu and Bentler (1999) suggested the following minimal acceptable values for the indices: $>.90$ for CFI and TLI and RMSEA close to $.06$. Moreover, the Bollen-Stine method is a modified Chi-Square for bootstrapping to account for non-normal data and is suggested the p value be $>.05$ (Byrne, 2001). However, the Chi-Square value should be interpreted cautiously as scholars warn that the Chi-Square statistic is skewed by sample size and data normality issues.

Further, after conducting CFA's, structural path analysis with AMOS 18.0 was used to examine the hypothesized relationships among latent constructs. Structural equation modeling is advantageous because it allows modeling of complex patterns of relationships while accounting for measurement error. For both the CFA's and path analysis, this sample ($n=113$) falls short of the prescribed recommendation of five observations per parameter (Bentler & Cho, 1987). Therefore, the sample was not large enough to run a full information model. To manage this limitation, and reduce the number of parameters required for estimation, CFA's were simplified into separate analyses for mindsets/tensions (Paradoxical Thinking and Paradoxical tensions) and innovative behavior. When conducting the path analysis, to reduce the number of parameters estimated and reduce measurement error, single item indicators were formed for each construct. The items for each unique variable were combined to form a single indicator via SPSS 18.0 factor reduction.

Following the two-step prescribed procedure to estimate the psychometric properties and relationships among constructs, several post-hoc tests were conducted to assess the measurement instrument for common method bias. Common method bias stems from the way the data are measured rather than variance from the actual construct. This can cause systematic measurement error that exacerbates the bias of estimates among the constructs (Spector, 2006). Common method bias can be a substantial issue for measurement validity in any survey with self report. Therefore, several steps were taken to mitigate and assess the measure. As discussed previously, efforts were first made during the design of the measures to overcome such bias. Next, several recommended post-hoc tests were conducted (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). First, Harman's (1976) single-factor test was conducted with exploratory factor analysis (EFA) in SPSS 18.0. Multiple factors emerged and the largest factor did not account for the majority of the variance; hence, it is likely that a significant amount of common method bias is not present (Podsakoff & Organ, 1986; Podsakoff, Todor, Grover & Huber, 1984). Second, a confirmatory factor analysis with a single factor was conducted. The model demonstrated poor fit, again indicating that a single factor does not account for the data. Both Harmon's single factor test and CFA indicate that common method bias is not likely confounding the interpretation of results.

RESULTS

The two novel measures of paradoxical tension and paradoxical thinking were validated, displaying significant factor loading greater $.40$ and reliabilities of $.7$ or greater, indicating convergent validity. Additionally the goodness of fit indicates the CFA models displayed good to moderate

fits: Paradoxical thinking and Tensions: Mindsets and Tensions: 2 (28.239, $p=.168$), Bollen Stine (.333), TLI (.973), CFI (.984), RMSEA (.050).

Based upon the CFA's conducted, all three model variables displayed reliability, convergent and discriminatory validity; and therefore, were utilized in the structural equation model. According to the AMOS 18.0 structural model output, the initial model achieved adequate fit (Figure 1): 2 (21.909, $p=.289$), Bollen Stine (.324), TLI (.915), CFI (.942), and RMSEA (.037). Next, the path coefficients, critical ratio, p -values, and bootstrap confidence intervals were examined to determine path significance. The analysis revealed that two paths were significant. First, the path from paradoxical thinking to innovative behavior was significant ($P=.001$) with a path coefficient of .451. Therefore, hypotheses two suggesting that family firm leaders' paradoxical thinking is positively related to innovative behavior was supported.

Furthermore, the path from the interaction term (paradoxical thinking * paradoxical tensions) was significant with a path coefficient of .152 ($p=.061$). Therefore, hypothesis three, which stated family firm leaders' paradoxical thinking moderates the relationship among tensions and innovative behavior, was supported. To further test the significance of the moderation, the model with the interaction path freely estimated was compared with a model with the interaction path constrained to one. Again, the moderation effect was demonstrated as the unconstrained moderation model had a better fit than the initial hypothesized model, while the constrained moderator model demonstrated poor fit: χ^2 (82.607, $p.000$), Bollen Stine (.123), TLI (-.737), CFI (.000) and RMSEA (.166). Additionally, because a moderator alters the direction and/or strength of the relationship between the predictor and outcome variables (e.g., Barron & Kenny, 1986), it is important to understand how the moderator interacts with the variables. To gain insight, scholars suggest graphing the interaction effect (Aiken & West, 1996). The interaction was graphed using a procedure recommended by Cohen and Cohen (1983). The procedure plots three chosen distinct levels of the continuous moderator variable (PT) against TENS and IB: High (+1SD), Medium (mean) and Low (-1SD) (Figure 11). The graph implies the following relationships: (1) when tensions are high, paradoxical thinking is high, then innovative behavior is high (2) when tensions are high, paradoxical thinking is low, then innovative behavior is low (3) when tensions are low, paradoxical thinking is high, then innovative behavior is high (4) when tensions are low, paradoxical thinking is innovative behavior is medium or (5) when tensions are medium, paradoxical thinking is high, then innovative behavior is high (figure 2). These results reaffirm extant theory, suggesting paradoxical thinking enables innovative behavior when tensions are high. Alternatively, innovative behavior is lower when tensions are high and actors do not engage in paradoxical thinking. Additionally, firm size, age and industry were not found to be significantly related to family firm innovative behavior and when the control variables are included in the model the significant relationships remained unchanged. These findings suggest that paradoxical thinking positively impacts innovative behavior and further that paradoxical thinking moderates the relationship among paradoxical tensions and innovation.

DISCUSSION AND CONCLUSION

This study contributes to extant understandings in multiple ways. The study extends existing theory and empirical evidence from organizational innovation and paradox literature to the context of family business. Further it offers conceptual insights, providing rare measures of specific paradoxical tensions and of paradoxical thinking. These validated scales can be applied to prior qualita-

tive studies to empirically validate the existence of paradoxical tensions and paradoxical thinking, aiding in generalizable findings. However, because this study only gave a static snap shot to enhance generalizability and deepen understanding, future studies might examine the interplay of paradoxical tension, paradoxical thinking and family firm innovation over time, to infer causality.

This study also seized a rare opportunity to investigate the inherent tensions in family firms and their management. Findings empirically demonstrated that family businesses do have inherent tensions, which have been anecdotally discussed to date. These firms' illustrated tensions surrounding the level of tradition or change they should undertake, how to reinvest profits, and control and autonomy between the generations. Moreover, this work investigated the type of thinking leadership utilizes to either foster or stymie innovative behavior, empirically investigating paradoxical thinking. Results confirmed assertions that when firm leaders' engage in paradoxical thinking, they are more likely to manage these tensions to become innovative. Hence, this study suggests that paradoxical thinking plays a pivotal role in encouraging innovative behavior. Moreover, the findings reveal that there is an intricate relationship among tensions, paradoxical thinking and innovative behavior; whereas paradoxical thinking is essential in managing the inherent tensions of family businesses to fuel innovation.

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Figure 1
Model of Family Firm Innovative Behavior

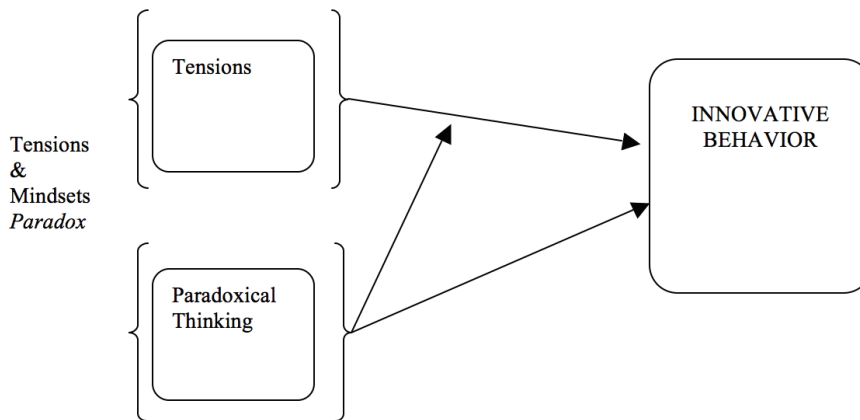
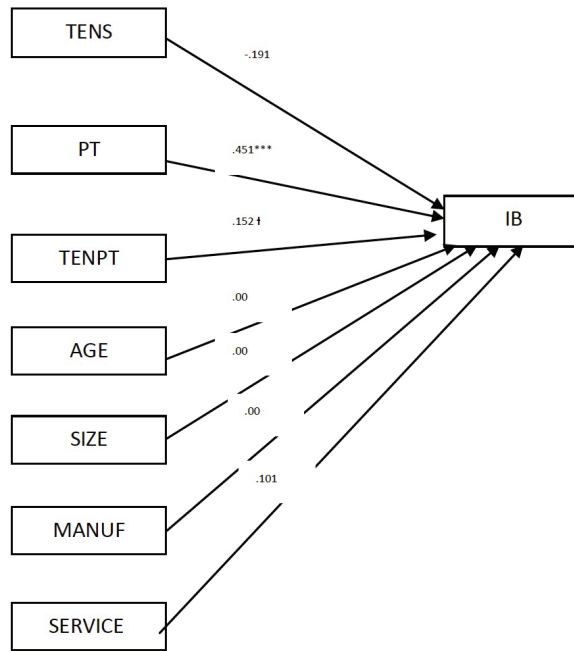


Figure 2
 Hypothesized Model



Standardized Solution Shown and All Exogenous Factors Allowed to Co-Vary (Not Shown)
 $\chi^2=21.009$, $p=.289$, TLI =.915, CFI=.942, RMSEA=.037
 $I=p<.10$, $**=p < 0.05$; $*** = p < 0.01$

Figure 2
 Moderation

