Entrepreneurial intentions: The influence of organizational and individual factors

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Abstract

An individual's intent to pursue an entrepreneurial career can result from the work environment and from personal factors. Drawing on the entrepreneurial intentions and the person-environment (P-E) fit literatures, and applying a multilevel perspective, we examine why individuals intend to leave their jobs to start business ventures. Findings, using a sample of 4192 IT professionals in Singapore, suggest that work environments with an unfavorable innovation climate and/or lack of technical excellence incentives influence entrepreneurial intentions, through low job satisfaction. Moderating effects suggest that an individual's innovation orientation strengthens the work-environment to job-satisfaction relationship; self-efficacy strengthens the job-satisfaction to entrepreneurial intentions relationship.

1. Executive Summary

The presence of technology-based firms has long been associated with a nation's economic growth and prosperity. Many of these firms emerge when IT professionals leave their organizations to start businesses. This paper examines why IT professionals intend to leave their jobs to start business ventures. We focus on entrepreneurial intentions, since intentions toward a purposive behavior can be crucial antecedents of that behavior. Understanding the factors influencing entrepreneurial intentions is, thus, a central component of studying the new venture creation process. Specifically, we examine how individual- and organizational-level factors (such as individual innovation orientation, organizational innovative climate and technical excellence incentives) interact to affect the level of job satisfaction experienced by IT professionals, which in turn, impacts entrepreneurial intentions. The strength of the relationship between the level of job satisfaction and entrepreneurial intentions, however, can be moderated by the individual's self-efficacy.

Our sample comprised 4192 IT professionals from IT user firms, vendor firms, and government organizations. The results of this study indicate that individuals with high innovation orientation—more so than their low innovation orientation counterparts—are negatively affected (experience low job satisfaction) by a restrictive organizational innovative climate and poor technical excellence incentives. Furthermore, contrary to existing studies that theorize direct links between negative situational factors and entrepreneurial intentions, we found that the mismatch between individual characteristics and poor organizational conditions is indirectly linked to entrepreneurial intentions through low job satisfaction. Our findings also suggest that self-efficacy strengthens the relationship between low job satisfaction and entrepreneurial intentions. This finding suggests that employees who are confident of their job

skills may be more motivated to leave their companies to start businesses if they experience low job satisfaction.

We advance the research in understanding what motivates individuals to leave their jobs to form new businesses. We employ the multilevel perspective, including the impact of low job satisfaction and self-efficacy, while accounting for the misfit between the individual's innovation orientation and the organization's innovative climate and technical excellence incentives. More importantly we show that, while self-employment becomes desirable when there is a mismatch between employee innovation orientation and characteristics of the organizations for which they work, the progression from low job satisfaction to entrepreneurial intentions may depend on feasibility perceptions, that is, self-efficacy. High self-efficacy employees may be more confident about starting successful businesses; these employees may, therefore, be more apt to leave their companies to start businesses if they experience low job satisfaction.

Our results also provide insights for organizational leaders and policymakers in managing innovations and in cultivating entrepreneurship. Organizations valuing innovation can put structures and incentives in place to cultivate an innovative climate to help prevent "brain drain" and the consequences of having employees leave to set up new, potentially competitive ventures. Alternatively, organization leaders can exploit the misfit between individual needs and organizational characteristics by providing spin-off opportunities to tap into employees' desires for innovation. Employees who are not satisfied with their organizational practices can be allowed to start spin-offs, and the parent organizations can support them with financial and human resources. Policymakers can provide educational and training programs to employees who are not satisfied with their jobs to raise their self-efficacy levels, hence strengthening their confidence in pursuing entrepreneurship as an alternative career choice.

2. Introduction

The presence of technology-based firms has long been associated with a nation's economic growth and prosperity (Rothwell & Zegveld, 1982). IT professionals who leave their organizations to start businesses are a key source of these firms (Roberts, 1991; Romanelli & Schoonhoven, 2001). This paper addresses the reasons IT professionals leave their jobs to start business ventures. We focus on entrepreneurial intentions as crucial antecedents of that purposive behavior (Ajzen, 1987; Ajzen & Fishbein, 1980; Krueger, Reilly, & Carsrud, 2000). Understanding the factors influencing entrepreneurial intentions is, thus, a central part of studying the process of venture creation.

The research on entrepreneurial intentions examines the main factors: desirability (perceptions of the personal appeal of starting a business) and feasibility (degree to which one feels capable of doing so) (Krueger et al., 2000; Shapero & Sokol, 1982). Relative to the desirability factor, we examine individual-level factors of innovation orientation, job satisfaction, and self-efficacy together with organizational-level factors of innovative climate and technical excellence incentives. We theorize that IT professionals are driven into entrepreneurship by low job satisfaction (Brockhaus, 1980; Cromie & Hayes, 1991; Watson, Hogarth-Scott, & Wilson, 1998) caused by a mismatch between their innovation orientation and characteristics of the organizations for which they work (innovation climate and technical excellence incentives).

We extend the entrepreneurial intentions literature by introducing a multilevel perspective of individual and organizational factors influencing business creation intentions. Proponents of multilevel research (Hitt, Beamish, Jackson, & Mathieu, 2007; Ireland & Webb, 2007), particularly in entrepreneurial research (Davidsson & Wiklund, 2001), explain that to understand entrepreneurial intentions, researchers must account for both organizational and

individual factors. While studies indicate that organizational factors influence the job satisfaction of technical employees (Mak & Sockel, 1999; Sankar et al., 1991), these studies offer little on why these factors affect some individuals more than others. We provide a better understanding by introducing the single characteristic, innovation orientation, as a moderating factor. We theorize that the higher the employee's desire for innovation, the stronger the influence of restrictive innovative climate/poor technical excellence incentives on job satisfaction.

Regarding the feasibility factor, we advance entrepreneurial intentions research by looking beyond the main effects of self-efficacy on entrepreneurial intentions (Krueger et al., 2000; Shapero & Sokol, 1982). We theorize that self-efficacy strengthens the relationship between low job satisfaction and entrepreneurial intentions. High self-efficacy employees can be more confident about starting successful businesses; these employees are, therefore, more apt to leave their companies to start businesses if they experience low job satisfaction. Taken as a whole, we include individual- and organizational- level influences on entrepreneurial intentions, as well as the moderating effects of innovation orientation and self-efficacy on these relationships. Figure 1 summarizes our conceptual model.

Insert Figure 1 about here

In the next section, we review the entrepreneurial intentions literature. We then use the person-environment (P-E) fit theory to hypothesize the interactive effects of individual innovation orientation and organizational innovation climate/technical excellence incentives on job satisfaction. We explain the relationship between low job satisfaction and self-efficacy on entrepreneurial intentions. We present the methods and the results. Finally, we discuss the implications of the findings for organizational leaders and policy makers.

3. Theoretical background and hypotheses

3.1. Entrepreneurial intentions

Entrepreneurship is defined as the process of organizational *emergence* (Gartner, Bird, & Starr, 1992). Entrepreneurial intentions are crucial to this process, forming the first in a series of actions to organizational founding (Bird, 1988). Moreover, intentions toward a behavior can be strong indicators of that behavior (Fishbein & Ajzen, 1975).

Our understanding of entrepreneurial intentions is guided by two models: Ajzen's (1991) theory of planned behavior (TPB), and Shapero's (1982) model of the entrepreneurial event (SEE). TPB was developed to explain how individual attitudes towards an act, the subjective norm, and perceived behavioral control are antecedents of intentions. The SEE model was developed to understand entrepreneurial behavior. Entrepreneurial intentions are derived from perceptions of desirability, feasibility, and a propensity to act upon opportunities. In this model, *perceived desirability* is defined as the attractiveness of starting a business, *perceived feasibility* as the degree to which an individual feels capable to do so, and *propensity to act* as the personal disposition to act on one's decisions.

Both the TPB and SEE models provide comparable interpretations of entrepreneurial intentions (Krueger, 1993; Krueger et al., 2000). Krueger et al. demonstrated that attitudes and subjective norms in the TPB model are conceptually related to *perceived desirability* in SEE; while perceived behavioral control in TPB corresponds to *perceived feasibility* in the SEE model. Essentially, *perceived desirability* and *perceived feasibility* are fundamental elements of intentional behavior.

In this paper, we examine the impact of perceived desirability and perceived feasibility on the IT professional's intentions to start a business. Our research links the individual-level

factors of innovation orientation, job satisfaction, and self-efficacy to the organizational-level factors of innovative climate and technical excellence incentives. Specifically, we study the central role job satisfaction plays in influencing IT professionals' intent to become entrepreneurs, accounting for organizational- and individual-level antecedents, and the moderating effects of self-efficacy on entrepreneurial intentions.

3.2 P-E fit and job satisfaction

Studies have established that job satisfaction predicts entrepreneurial intentions (Brockhaus, 1980; Eisenhauer, 1995; Watson et al., 1998). Much of the job satisfaction literature posits that organizational climate determines job satisfaction (Agho, Mueller, & Price, 1993; Welsch & LaVan, 1981). A supportive organizational climate is often represented by management commitment, strong supervisory and peer support, and opportunities for innovation (Niehoff et al., 1990; Yuki, 1989). Research findings indicate that support from one's superior and peers helps employees alleviate job stress and burnout, which may increase job satisfaction. Such support may be particularly crucial in tasks where outcomes are uncertain, such as in innovative work environments (Niehoff, Enz, & Grover, 1990; Yuki, 1989). Thus, in the context of individuals who thrive at the front end of technology—for example, IT professionals— an organizational climate supportive of innovation should lead to higher job satisfaction levels.

Another organizational factor, technical excellence incentives in the form of rewards, can also lead to higher job satisfaction levels (Eisenberger & Rhoades, 2001). Organizational incentives signal the organization's goals and objectives. Poor incentives indicate a lack of organizational support and can have significant detrimental effects on job satisfaction, since IT employees value rewards as well as opportunities for continued training, learning, and development (Coff, 1997; Mak & Sockel, 1999).

While organizational factors, including innovative climate and incentives, should influence the job satisfaction of IT professionals, existing studies offer little information on which individuals are more likely than others to be affected by these organizational factors. We use the P-E fit theory to connect organizational factors to individual factors. Specifically, we introduce an individual's desire for innovation, which we term as *innovation orientation*, as the individual component of the P-E equation. Empirical evidence in the P-E fit domain suggests that employees exposed to the same organizational environment may not develop similar job satisfaction levels (Cable & Edwards, 2004; Kristof-Brown, Ryan, Zimmerman, & Johnson, 2005). Instead, job satisfaction results from the congruence between organizational characteristics and individual needs (Cable & Edwards, 2004; Kristof-Brown, Ryan, Zimmerman, & Johnson, 2005).

Specifically in this study, some individuals (IT professionals) are more innovation-oriented than others. Thus, following the reasoning of the P-E fit theory, in an organization with a restrictive climate for innovation and/or inadequate incentives, high innovation-orientation individuals can experience lower job satisfaction levels compared to their low innovation-orientation counterparts. This is because the needs of high innovation-orientation individuals are best served by an organizational climate supportive of technological achievements. On the basis of these considerations we hypothesize that:

H1a: The relationship between organizational climate for innovation and job satisfaction is moderated by innovation orientation, such that the higher an individual's innovation orientation, the stronger the relationship between the organizational climate for innovation and job satisfaction.

H1b: The relationship between technical excellence incentives and job satisfaction is moderated by innovation orientation, such that the higher an individual's innovation orientation, the stronger the relationship between technical excellence incentives and job satisfaction.

3.3 Low job satisfaction and entrepreneurial intentions

Job satisfaction has been the subject of considerable interest in entrepreneurial research (Brockhaus, 1980; Cromie & Hayes, 1991; Hisrich & Brush, 1986). Poor organizational conditions can trigger low job satisfaction, which in turn can trigger the desire to start a business venture.

Positive relationships between low job satisfaction and entrepreneurial intentions are well documented within the *push* theory of entrepreneurship. Frustrated employees are more likely to consider entrepreneurship as an alternative career avenue (Brockhaus, 1980; Cromie & Hayes, 1991; Henley, 2007). For example, Eisenhauer (1995) reported that individuals are motivated to start their own businesses if the satisfaction from wage employment is lower than the perceived satisfaction possibly derived from self-employment. The push effects of low job satisfaction on entrepreneurial intentions is particularly relevant among IT professionals, because these individuals are often motivated by challenge and have high achievement needs (Couger, 1988).

As noted earlier in this paper, low job satisfaction can result from a mismatch between the IT professional's innovation orientation and organizational characteristics. In this instance, the entrepreneurial option offers IT professionals the opportunity to realize their achievement needs. Thus, low job satisfaction is a central component whereby unfavorable organizational conditions for innovation are translated into entrepreneurial intentions. Therefore, we hypothesize:

H2a: Job satisfaction mediates the relationship between a restrictive organizational climate for innovation and entrepreneurial intentions.

H2b: Job satisfaction mediates the relationship between inadequate technical excellence incentives and entrepreneurial intentions.

3.4 The moderating role of self-efficacy

While low job satisfaction can motivate IT professionals to start a business, entrepreneurial intentions can also be influenced by self-efficacy factors (Bandura, 1986; Chen, Greene, & Crick, 1998). Self-efficacy is a person's judgment of his/her ability to execute a targeted behavior (Ajzen, 1987). Prior studies have identified self-efficacy as a key contributor to entrepreneurial intentions, either directly or indirectly through influencing perceived feasibility (Krueger, 1993; Krueger et al., 2000). However, the degree to which self-efficacy interacts with perceived desirability to influence entrepreneurial intentions has not been considered.

In our study, *self-efficacy* is defined as an IT professional's perceived competency in performing a set of IT skills. Individuals tend to start businesses in areas linked to their job skills and job related experiences (Shane, 2000; Wong, Lee, & Foo, 2008). The more confident IT professionals are in their abilities to excel in IT-related tasks, the more likely they are to develop entrepreneurial intentions when job satisfaction is low. Thus, we hypothesize:

H3: The relationship between low job satisfaction and entrepreneurial intentions is moderated by self-efficacy, such that the higher the individual's self-efficacy, the stronger the relationship between low job satisfaction and entrepreneurial intentions.

4. Methods

4.1 Data Source

Data were obtained from two sources. The first source was the 1995 Singapore National Computer Board survey of IT professionals.[1] A sampling frame of organizations that employ IT professionals in Singapore was developed from Infocomm Development Authority (IDA) Singapore. The frame was stratified by sectors such as vendors, end-users, and government organizations. Invitations to participate in the survey were mailed to 9,527 IT professionals from these sectors, resulting in a final sample of 4,192 usable questionnaires (1,299 from vendor firms, 1,326 from IT user firms, and 1,567 from government organizations)—a response rate of 44%. Nonresponse bias was examined using one-way between group analysis of variance (ANOVA). Respondents and nonrespondents did not differ in gender (F of 1.65, $p = 0.84$), age (F of 1.24, $p = 0.69$), or IT sector (F of 0.97, $p = 0.58$).

The second data source, collected in July and August, 2008, comprised IT professionals in Singapore and Kuala Lumpur (the capital city of Malaysia). These individuals were recruited through the first author's personal contacts. This data collection included scales to assess the convergent and discriminant validities of the study's variables. Data were collected in two countries to obtain a sufficient number of responses to assess the validity of our study's variables. As Singapore and Kuala Lumpur are global cities with multiracial populations, the location should not affect the data. Of the 210 technical professionals invited, 172 responded to the survey.

Respondents' work experience in IT-related areas averaged 9.46 years, and the average age was 33.25 years. Some 68% were males and a majority had bachelor's degrees with incomes

[1] Apart from a report that was submitted to the government agency that commissioned the survey, this study represents one of the first attempts to analyze the survey data for research purposes.

between S$30K and S$60K. Nonresponse bias was examined by comparing respondents (n = 172) with nonrespondents (n = 38). We found no significant differences for age (F = 0.53; p = 0.40), gender (F = 0.61; p = 0.47), IT sector (F = 0.85; p = 0.61), or location (F = 0.63; p = 0.49). Respondents in the main dataset (n = 4,192) and the validity dataset (n = 172) were comparable in age (F = 0.92; p = 0.83), gender (F = 1.01; p = 0.89), income (F = 0.67; p = 0.70), education (F = 0.63; p = 0.49), and IT work experience (F = 0.93; p = 0.75). In the analyses, we combined both data sources and included a year control. Based on the 4,364 usable responses (4,192 + 172), the respondents' work experience in IT-related areas averaged 9.35 years, with an average age of 34.69 years. Some 65% of the respondents were males; a majority had bachelor's degrees and incomes between S$30K and S$60K.

4.2 Measures

Table 1 presents the wordings and scale points of the key variables. Unless otherwise indicated, all the constructs used a 5-point Likert scale response that ranged from strongly disagree (1) to strongly agree (5). A summary of the measures used is outlined below.

Insert Table 1 about here

Entrepreneurial intentions. Entrepreneurial intentions were measured with a 2-item scale; that is, "I have always wanted to work for myself (i.e., be self-employed)," and "If I have the opportunity, I would start my own IT company" (α = 0.72). Existing studies have considered Cronbach's alpha values of 0.70 and above to be reliable. For example, Souitaris, Zerbinati, and Al-Laham (2007) used six measurement items with reliabilities between 0.70-0.75 in their analysis. Similarly, Knight (1997) reported reliability coefficients in the 0.70-0.90 range. Factor analysis with reliability alphas of 0.70 or greater were retained in Phan, Butler, and Lee (1996).

Furthermore, Nunnally (1978) considered the reliability criteria of 0.70 as satisfactory; our entrepreneurial intentions measure (0.72), meets this criteria.

Studies maintain that intentions predict behaviors (Ajzen, 1991; Sheppard, Hartwick, & Warshaw, 1988). Entrepreneurial intentions are assumed to predict, although imperfectly, an individual's choice to found his/her own firm (Davidsson, 1995). We randomly selected over 100 respondents 6 years after the baseline survey was conducted and asked them if they had started their own businesses. We correlated the binary responses with the Likert responses of their entrepreneurial intentions and found a positive correlation between entrepreneurial intentions and business startup (Point Biserial correlation = 0.57; $p < 0.05$). Table 2 presents the results of the validity study conducted to assess the convergent and discriminant validity of the measures developed in this study. Providing evidence of convergent validity, our measure strongly correlated ($r = 0.79$, $p < 0.01$) with Kolvereid's (1996) measure of entrepreneurial intentions.

Insert Table 2 about here

Technical excellence incentives. We developed a 7-item scale to measure technical excellence incentives. Examples of items are "My organization has a limited budget for IT skills development," (reverse-coded) and "Where I work, we are rewarded for technical competence" ($\alpha = 0.80$). The item "My organization has a limited budget for IT skills development" refers to an incentive or reward for "skills development," and not a monetary incentive or reward *per se*. The factor analysis using principal component analysis and varimax rotation with the Kaiser Normalization method revealed that all items loaded on a single factor. Our measure for *incentives for technical excellence* was significantly related to Scott and Bruce's (1994) "rewards and resource supply for innovation" scale ($r = 0.80$; $p < 0.01$), providing support for convergent

validity. Our incentives for technical excellence measure was not significantly related to Litwin and Stringer's (1968) general measure of organizational rewards ($r = 0.12$; $p > 0.05$), providing support for discriminant validity.

Innovation climate. We used a 6-item scale to measure innovation climate. Examples of items used are "My supervisor rarely solicits ideas from me to solve technical problems," (reverse-coded) and "Based on their experience, my peers often suggest new approaches to solving technical problems." The scale was reliable ($\alpha = 0.83$) and all six items loaded on a single factor. Our measure for *innovation climate* related significantly to Scott and Bruce's (1994) "organizational support for innovation" scale ($r = 0.72$; $p < 0.01$). However, our innovation climate was not related to Dastmalchian's (1986) general measure of organizational climate scale ($r = 0.12$; $p > 0.05$). Both our measure and Scott and Bruce's (1994) measure of climate for innovation were significantly related to entrepreneurial intentions in the validity data set, providing evidence of predictive validity for both measures. Dastmalchian's (1986) general measure of organizational climate was not significantly related to entrepreneurial intentions, providing evidence of discriminant validity.

Job satisfaction. Three items adapted from the Michigan Organizational Assessment Questionnaire (Seashore, Lawler, Mirvis, & Cammann, 1982) were averaged to create a measure of job satisfaction ($\alpha = 0.85$).

Innovation orientation. Innovation orientation was measured with a 6-item scale. Examples of items used are "I often take risks in unfamiliar assignments," "Where possible, I take on technically difficult and challenging job assignments." and "I am technically up-to-date" ($\alpha = 0.81$). When subjected to exploratory factor analysis, one factor solution emerged with an eigenvalue greater than 1. Our measure of innovation orientation was significantly related to

Farmer, Tierney and Kung-McIntyre's (2003) measure of creativity ($r = 0.72$; $p < 0.01$), but not significantly related to Jackson's (1994) measure of risk taking ($r = 0.12$; $p > 0.05$), providing evidence of convergent and discriminant validities.

Self-efficacy. Self-efficacy was measured using a task-specific scale. Respondents were asked to rate their skills in a number of IT related areas (such as software development, database design/administration, and development of multimedia applications along scales) where 1 = None, 2 = Basic, 3 = Competent, 4 = Advanced, and 5 = Expert ($\alpha = 0.88$). Researchers often have to choose between general self-efficacy (GSE) and task-specific self-efficacy scales (for a review see Chen, Gully, and Eden, 2001).

We used a task-specific self-efficacy scale because GSE may not predict domain-specific behaviors (Eden and Granat-Flomin, 2000; Pajares, 1996). Within task-specific self-efficacy scales, we developed a scale for IT-related tasks because of our sample (IT professionals). Discriminant and convergent validity tests indicate that our IT-related self-efficacy scale converges with Chen et al.'s (2001) measure of general self-efficacy ($r = 0.80$, $p < 0.01$) and not with Chen et al.'s (1998) measure of entrepreneurial self-efficacy ($r = 0.18$; $p > 0.05$).

The convergence of our measure with the general measure of self-efficacy suggests that our scale overcomes one criticism of task-specific self-efficacy scales, its lack of relation to GSE (Zhao, Hills, & Seibert, 2005). The nonconvergence with ESE suggests that IT-related tasks are significantly different from entrepreneurial tasks; hence, our IT task-specific efficacy scale may be more suitable than ESE for our study of IT professionals. Table 3 summarizes the convergent and divergent validities of the measures used.

Insert Table 3 about here

4.3 Control variables

Seven control variables (age, income, experience in IT-related work, opportunity exposure, highest education attained, gender, and year) data were collected. Note that opportunity exposure was operationalized as two dichotomous variables: a) IT sales and marketing job function and IT research, and b) development job function.

We controlled for the respondent's age in squared terms because of its influence on career decisions. Age has an inverted U-shaped relationship to the probability of entering self-employment (Alba-Ramirez, 1994; Bates, 1995). Initially, age incorporates the positive effect of experience and increases the likelihood that people will start their own businesses. However, as people age, their opportunity costs rise along with higher incomes, which decreases the likelihood of self-employment. Consequently, we used income, which has been found to be negatively related to entrepreneurial intentions (Long, 1982) as a proxy for opportunity cost.

We used the individual's IT experience as a proxy for prior knowledge, which is a critical antecedent of entrepreneurial decisions (Shane, 2000). Romanelli and Schoonhoven (2001) found that individuals who are involved in marketing and sales are more likely to obtain first-hand information about market opportunities, and are, thus, more likely to develop intentions to exploit these opportunities. Similarly, individuals' knowledge about how new or existing technology serves the needs of the market may motivate them to start businesses to address these needs. Therefore, we controlled for the respondent's exposure to IT sales, marketing, research, and development work.

The literature also shows links between entrepreneurial intentions and educational attainments (Crant, 1996). Highest education attained was operationalized as four ordinal categories; postgraduate degree, undergraduate degree, diploma and technical degree, and below

diploma and technical degree. Entrepreneurial intentions were often associated with gender (Crant, 1996). Males were found to be more adventurous in experimenting with their careers, while females were found to be constrained by family responsibilities and less likely to develop entrepreneurial intentions. To assess if the findings were affected by the year the data were collected, we controlled for year using a dichotomous variable (2008 =1).

4.4 Data Analysis

We analyzed the effects of P-E fit on the individual's level of job satisfaction, as well as the moderating effects of self-efficacy on the relationship between job satisfaction and entrepreneurial intentions. The measures of P-E fit include the organizational innovation climate, technical excellence incentives, and the individual's innovation orientation. We used hierarchical OLS regression to test the study's hypotheses.

5. Results

5.1 Correlations

Table 4 presents the summary statistics and zero order correlations. The bivariate relationships indicate that all the independent variables related significantly to entrepreneurial intentions. As observed, the variable most highly related to entrepreneurial intentions was job satisfaction ($r = -0.32$, $p < 0.01$), and although entrepreneurial intentions were also correlated to other control variables, the associations were much weaker. In addition, the five independent variables were not highly correlated to each other. Similarly, the independent variables including innovation climate, technical excellence incentives, and innovation orientation were not correlated to job satisfaction at the 1% level. The correlation coefficients among all other variables were all below 0.60 (Kennedy, 1992) and none of the variance inflation factors (VIFs) for the variables was greater than 2, which was below the guideline of 10 by Chatterjee and Price

(1991). Thus, it was unlikely that multicollinearity among the independent variables affected the findings.

Insert Table 4 about here

5.2 Regressions

Table 5 shows the moderating impact of an individual's innovation orientation on the relationship between the organizational innovation climate and the level of job satisfaction (Hypothesis 1a). The results also show the moderating impact of the individual's innovation orientation on the relationship between organizational technical excellence incentives and job satisfaction (Hypothesis 1b). Table 4 presents the regression results on the mediating effects of job satisfaction (Hypothesis 2a and 2b), and the moderating impact of self-efficacy on the job satisfaction and entrepreneurial intentions relationship (Hypothesis 3).

Insert Table 5 about here

Model 1 is a baseline model consisting of control variables. Results indicate that age had a U-shaped relationship to job satisfaction. Initially, age decreases the likelihood of job satisfaction, but job satisfaction is higher as age level increases (Rhodes, 1988). High income IT professionals were more likely to be satisfied with their jobs and less likely to develop entrepreneurial intentions. The control variable (year) was not significant ($p > 0.10$), suggesting that the findings of our study were not affected by the year the data were collected. Furthermore, the results provide corroborating evidence that individuals with higher education qualifications have higher expectations regarding rewards, benefits, and organizational support, and thus are less likely to be satisfied with their jobs (Lam, Zhang, & Baum 2001; Zhang, Lam, & Baum 1999) and more likely to have entrepreneurial intentions.

Model 3 presents the results of the interactive effects between the organizational innovation climate and innovation orientation, and between organizational technical excellence incentives and innovation orientation on job satisfaction. Results show that these interactive factors had significant negative impact on job satisfaction (-1.911, $p < 0.01$; -1.614, $p < 0.001$). The pseudo R^2 increased to 29% in Model 3 from 12% in Model 1. These findings support Hypothesis 1a, which states that, the higher an individual's innovation orientation, the stronger the relationship between organizational climate for innovation and job satisfaction. The findings also support Hypothesis 1b, which states that, the higher an individual's innovation orientation, the stronger the relationship between technical excellence incentives and job satisfaction.

The Sobel t-test (1982) provides additional support of the mediating effects of job satisfaction ($t = 2.263$, $p < 0.05$). However, the Sobel test does not indicate whether partial or full mediation has occurred. To test whether job satisfaction partially mediates the relationship between a restrictive innovation climate and entrepreneurial intentions (Hypothesis 2a), and between poor organizational technical excellence incentives and entrepreneurial intentions (Hypothesis 2b), we followed the framework outlined by (Baron & Kenny, 1986). The results are shown in Models 3, 4, 5, 6, 7, and 8. According to Baron and Kenny, full mediation occurs when the following four conditions are met: (1) Independent variable/s must affect the mediator. In Model 3, the impact of organizational innovation climate and technical excellence incentives on job satisfaction was significant (2.145, $p < 0.01$; 1.743, $p < 0.01$). Similarly, the interactive effects of organizational innovation climate and innovation orientation, as well as technical excellence incentives and innovation orientation, were significant at 1% and 0.1%, respectively. (2) The independent variable(s) must affect the dependent variable. In Model 5, organizational innovation climate and technical excellence incentives had a significant relationship on

entrepreneurial intentions (-1.145, $p < 0.01$; 1.209, $p < 0.01$). The interactive effects of organizational innovative climate on innovation orientation, as well as technical excellence incentives and innovation orientation were significant at 1%. (3) The mediator must affect the dependent variable. The results in Model 6 highlight the negative effect of job satisfaction on entrepreneurial intentions (-1.417; $p < 0.01$). (4) Lastly, if the independent variable(s) was not significant in Model 8, full mediation effects were observed. On the other hand, if the independent variables were significant, then there were partial mediation effects. The results in Table 4 show that the independent variables were not significant, and that the four conditions were fully met, thus providing support for Hypotheses 2a and 2b. Job satisfaction was found to fully mediate the relationship between innovation climate/technical excellence incentives and entrepreneurial intentions. The interactive effects between job satisfaction and self-efficacy (-1.629; $p < 0.001$) provided support for Hypothesis 3, that the relationship between low job satisfaction and entrepreneurial intentions is moderated by self-efficacy, such that the higher an individual's self-efficacy, the stronger the relationship between low job satisfaction and entrepreneurial intentions.

The interactive effects models, that is, Models 3 ($r^2 = 29\%$; $p < 0.001$), 7 ($r^2 = 25\%$; $p < 0.001$), and 8 ($r^2 = 34\%$; $p < 0.001$), explained a significant amount of variance over and above the base model (Model 1, $r^2 = 12\%$; $p < 0.001$). The full model (Model 8) explained a significant amount of the variance ($r^2 = 34\%$) over and above the main effects models, that is, Models 2 ($r^2 = 21\%$; $p < 0.001$), 4 ($r^2 = 6\%$; $p < 0.001$), and 6 ($r^2 = 15\%$; $p < 0.001$).

Insert Table 5 about here

6. Discussion

Results of this study indicate relationships among a set of individual- and organizational-level factors contributing to IT professionals' entrepreneurial intentions. Consistent with the P-E fit arguments, we found support for Hypotheses 1a and 1b; that is, individual differences, specifically innovation orientation, moderate the relationship between poor organizational conditions and job satisfaction. Specifically, the higher the employee's innovative orientation, the stronger the negative effects of restrictive innovative climate/poor technical excellence incentives on job satisfaction.

The support we found for Hypotheses 2a and 2b suggests that the effects of a misfit between individual orientation and organizational conditions are indirectly linked to entrepreneurial intentions through low job satisfaction. Such findings align with the desirability arguments in the entrepreneurial intentions literature that intra- and extra-personal factors interact to influence the personal attractiveness (i.e., the level of job satisfaction in this paper) of starting a business.

Our findings supporting Hypothesis 3 indicate that self-efficacy not only influences perceived feasibility, as the entrepreneurial intentions literature suggests, but it can also moderate the relationship between perceived desirability and entrepreneurial intentions. Individuals' intentions to start their own businesses are likely to be boosted by the level of confidence they have in their own competencies when they experience low job satisfaction due to a mismatch between individual orientations and organizational environment.

6.1 Implications for research

This study extends the entrepreneurial intentions literature by introducing a multilevel perspective in understanding the factors contributing to the intent to start a business. Individual or organizational variables alone do not sufficiently explain the dynamic nature of

entrepreneurial intentions (c.f. Davidsson & Wiklund, 2001). Rather, the interaction between individual and organizational factors can provide better insights into the firm emergence process.

Furthermore, our study introduces the P-E fit perspective into the study of entrepreneurship. While the usefulness of the P-E fit theory in explaining entrepreneurial behavior is not entirely new (Brigham, Shepherd, & De Castro, 2007; Leung, Wong, Zhang, & Foo, 2006), the nature of the relationship between individual and organizational factors—and how this triggers entrepreneurial intentions—is still relatively unknown. Our findings indicate that low job satisfaction is caused, in part, by the mismatch between the individual's innovation orientation and the organization's innovative climate/ excellence incentives. Low job satisfaction, in turn, may lead to entrepreneurial intentions, particularly among high self-efficacy individuals. These findings demonstrate the mediating role of job satisfaction in translating the effects of a restrictive innovative climate/and or poor excellence incentives on individuals with high innovation orientation into entrepreneurial intentions. The findings build on and extend the desirability arguments in the entrepreneurial intentions literature by taking into account the roles of the individual and the environment in entrepreneurial intentions.

Previous research indicates the direct influences of negative situational factors on entrepreneurial intentions (Shapero & Sokol, 1982). We expected low job satisfaction to partially mediate the relationship between person-organization misfit and entrepreneurial intentions. However, the results revealed that the effects of mismatch between an individual's innovation orientation and organizational innovative climate/ excellence incentives on entrepreneurial intentions were fully mediated by low job satisfaction. For scholars, this implies that among the displacement factors, low job satisfaction is a critical conceptual link to entrepreneurial intentions.

To date, models of entrepreneurial intentions have primarily focused on the main effects of self-efficacy on entrepreneurial intentions (Krueger et al., 2000). We extend these models and theorize that, in addition to its primary effects, self-efficacy also moderates the intention to start a business venture. Our work contributes to the long-standing interest in the effects of self-efficacy on entrepreneurial intentions. Importantly, we found that, while individuals can be driven into entrepreneurship by negative situational factors such as low job satisfaction (Brockhaus, 1980), the strength of this relationship is stronger when self-efficacy is high. Furthermore, our study builds on Shapero and Sokol's (1982) intentions model. Rather than considering perceived feasibility (i.e., self-efficacy) and perceived desirability (i.e., low job satisfaction) as independent paths leading to entrepreneurial intentions, our study examines the interaction between the factors along those paths.

Results from this study suggest that low job satisfaction alone is inadequate in explaining entrepreneurial intentions. This probably explains why empirical evidence on the impact of low job satisfaction on entrepreneurial intentions has been mixed (Schjoedt & Shaver, 2007). Confidence in job competency provides the additional motivation necessary for employees who experience poor job satisfaction to consider entrepreneurship as an alternative career choice. Theoretically, our study offers a new perspective in the entrepreneurial intentions literature by demonstrating how the interactive effects of desirability and feasibility influence entrepreneurial intentions. Taken as a whole, the findings are consistent with Baron's (2007) assertion that individual-level factors predict the processes of new venture development. More critically, our findings support arguments from Hmieleski and Baron (in press) and Phan, Wright, Ucbasaran, and Tan (in press) that more multi-level research is needed in the field of entrepreneurship research.

6.2 Implications for practice

We investigated factors influencing IT professionals' intent to leave their jobs and start new ventures. Previous studies offer little information on which individuals, more so than others, are affected by poor organizational conditions. We found that employees with stronger innovation desires are more likely to experience low job satisfaction when faced with restrictive innovative climates and/or poor technical excellence incentives. This finding has implications for organizational leaders, particularly of technology-driven businesses. As the congruence between individual needs and organizational characteristics may predict job satisfaction, innovatively oriented organizations should recruit individuals with matching needs in their innovation orientation. Having employees with characteristics that fit their organizations is crucial because this synergy can significantly impact job satisfaction levels. Low job satisfaction, in turn, is a central factor that translates misfit between individual characteristics and poor organizational conditions into an employee's desire to leave the organization.

Organizations valuing innovation can put structures and incentives in place to cultivate an innovative climate to help prevent "brain drain" and the consequences of having employees leave to set up new, potentially competitive ventures. Alternatively, organization leaders can exploit the misfit between individual needs and organizational characteristics by providing spin-off opportunities to tap into employees' desires for innovation. Employees who are not satisfied with their organizational practices can be allowed to start spinoffs, and the parent organizations can support them with financial and human resources.

The moderating role of self-efficacy in the entrepreneurship equation has implications for policymakers in facilitating venture creation. Policymakers can target employees dissatisfied with their jobs for educational and training programs to raise their self-efficacy levels.

Entrepreneurial education programs can expose employees to the business environment, market opportunities, and real-life entrepreneurship situations. This may strengthen their confidence in pursuing entrepreneurship as an alternative career choice.

6.3 Limitations and future research

The findings of this study offer a number of opportunities for future research to advance our knowledge of the individual and organizational factors that predict IT professionals' intentions to start businesses. The present results showed that low job satisfaction fully mediates the relationship between person-organization misfit and entrepreneurial intentions. The effect of job satisfaction was the only mediator of the work environment-entrepreneurial intentions relationship considered in our study. Other potential mediators may include, for example, work motivation (Shane, Locke & Collins., 2003) and organizational commitment (Kickul & Zaper, 2000). In this study, we focus on the mediating role of job satisfaction because of its historical association with entrepreneurial intentions (Brockhaus, 1980). Future research can consider other mediators influencing the work-environment-entrepreneurial intentions relationship to gain a more comprehensive understanding of why individuals leave their jobs to start business ventures.

Future research should consider different aspects of job satisfaction (e.g., satisfaction with the work itself, remuneration, supervision, and co-workers) and how these influence entrepreneurial intentions. To broaden our understanding of the interactional effects between desirability perceptions and feasibility perceptions on entrepreneurial intentions, future studies should also look beyond self-efficacy to consider other individual factors, such as risk-taking propensity, locus of control, and degree of autonomy.

Additionally, further research of professions other than the IT sector is needed to validate the generalizability of our study's findings. Moreover, future studies could validate the

perceptual measures with objective proxies. For example, “incentives for technical excellence” could be correlated with proxy measures such as frequency of technical training, types and quantity of rewards for technical excellence, and organizational budget for technical training and education. It may also be useful to conduct longitudinal studies that track respondents as they follow through their entrepreneurial intentions to actually start a business.

To conclude, findings from our study point to the need for future research to account for multilevel factors, and to discover their direct, indirect, and moderating effects, thereby enhancing our understanding of what leads individuals to an entrepreneurial career.

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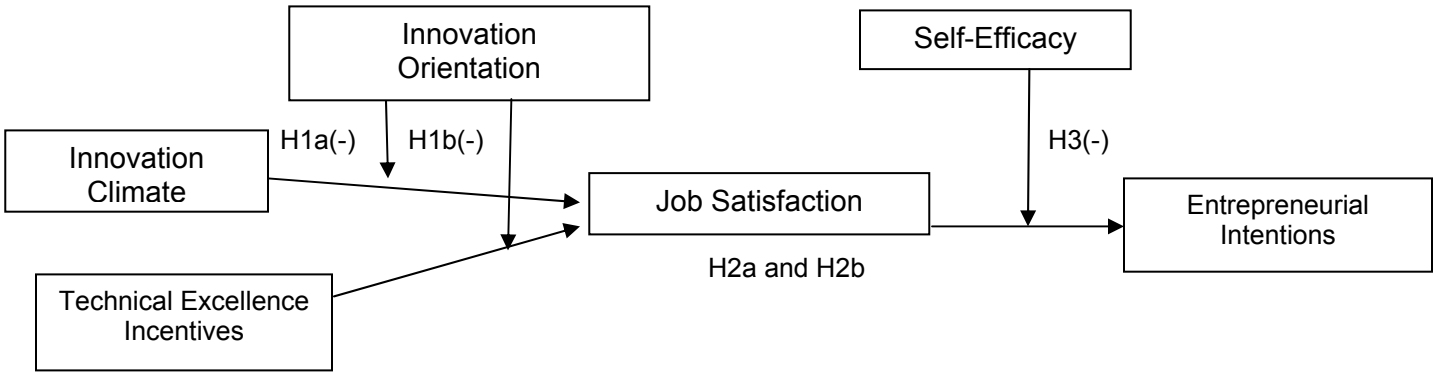

Figure 1. Proposed model of relationships among key constructs of study

Table 1. Measure Items and Response Formats

Construct and response format	Measurements
Entrepreneurial Intentions (α = .720)	
To what extent do you agree or disagree with the following statements?	I have always wanted to work for myself (i.e. be self-employed).
	If I have the opportunity, I would start my own IT company
Technical Excellence Incentives (α = .803)	
To what extent do you agree or disagree with the following statements?	In-house training provided by my organization has been useful.
	My supervisor matches my professional needs with opportunities to attend courses and technical meetings.
	Management does not view IT professional development as important. ®
	My organization has limited budget for IT skills development. ®
	I often participate in decisions relevant to my assignments.
	I am seldom assigned work in my areas of interest. ®
Innovation Climate (α = .826)	
To what extent do you agree or disagree with the following statements?	People I work with are not interested in IT skills development. ®
	Based on their experience, my peers often suggest new approaches to solving technical problems.
	Management maintains up-to-date technical library.
	I am encouraged to explore new ideas and to try new ways of doing things.
	I do not get opportunities to be independent and innovative. ®
	My supervisor rarely solicits ideas from me to solve technical problems. ®
Innovation Orientation (α = 0.807)	
To what extent do you agree or disagree with the following statements?	I often take risks in unfamiliar assignments.
	I am technically up-to-date.
	My peers and I often use innovative solutions to solve technical problems.
	Where possible, I take on technically difficult and challenging job assignments.
	I am recognised as a "technical expert" by my peers and associates.
	I do not regularly read articles in technical journals. ®
Self-Efficacy (α = 0.883) * 38 items were used	
Respondents were asked to rate their skill level in software development / maintenance of operating systems, computer languages for software development, systems development methodology, database design/administration, network administration, software development in several areas, use of development tools, development of multimedia applications and hardware design/development along scales where 1 = None, 2 = Basic, 3 = Competent, 4 = Advanced, 5 = Expert	
Job Satisfaction (α = 0.845	
To what extent do you agree or disagree with the following statements?	Overall, I am satisfied with my current job.
	I look forward to going in to work every morning.
	I often think of quitting my job. ®

Table 2. Means, Standard Deviations, Correlations, and Reliabilities for Validity Study Variables (N = 172)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Entrepreneurial intentions	(0.77)													
2. Entrepreneurial intentions (Kolvereid, 1996)	0.79**	(0.79)												
3. Self-efficacy	0.36**	0.34**	(0.89)											
4. General self-efficacy (Chen et al., 2001)	0.33**	0.35**	0.80**	(0.86)										
5. Entrepreneurial self-efficacy (Chen et al., 1998)	0.22*	0.24*	0.18	0.08	(0.83)									
6. Innovation orientation	0.28*	0.25*	0.26*	0.24*	0.18	(0.80)								
7. Creativity scale (Farmer et al., 2003)	0.24*	0.22*	0.21*	0.22*	0.14	0.72**	(0.94)							
8. Risk-taking scale (Jackson, 1994)	0.16	0.17	0.13	0.15	0.11	0.12	0.14	(0.85)						
9. Organizational innovation climate	-0.55**	-0.48**	0.10	0.09	0.07	0.05	0.11	0.02	(0.84)					
10. Organizational support for innovation (Scott & Bruce, 1994)	-0.56**	-0.57**	0.12	0.11	0.06	0.07	0.13	0.05	0.72**	(0.81)				
11. General measure of organizational climate (Dastmalchian et al., 1986)	-0.14	-0.11	0.08	0.10	0.14	0.09	0.06	0.06	0.12	0.07	(0.79)			
12. Organizational technical excellence incentives	-0.49**	-0.55**	0.13	0.12	0.07	0.06	0.10	0.07	0.09	0.11	0.05	(0.83)		
13. Rewards & resource supply for innovation (Scott & Bruce, 1994)	-0.42**	-0.46**	0.11	0.09	0.12	0.06	0.09	0.04	0.10	0.07	0.06	0.80**	(0.86)	
14. General measure of organizational rewards (Litwin & Stringer, 1968)	-0.10	-0.09	0.10	0.13	0.08	0.09	0.11	0.09	0.06	0.08	0.08	0.12	0.06	(0.82)
Mean	3.33	3.29	3.37	3.41	3.20	3.46	4.19	9.47	3.45	3.43	3.24	3.48	3.42	2.27
Standard Deviation	0.48	0.53	0.67	0.72	0.63	0.52	0.93	4.35	0.61	0.69	0.77	0.57	0.70	0.43

Note. Internal reliabilities are in parentheses. **$p < 0.01$; *$p < 0.05$

Table 3. Convergent and Divergent Validities of Measures

Measure	Converges on	Diverges from
1. Entrepreneurial intentions	Kolvereid's (1996) measure of entrepreneurial intentions	-
2. Technical excellence incentives	Scott & Bruce's (1994) measure of rewards and resource supply	Litwin & Stringer's (1968) measure of general organizational rewards
3. Innovation Climate	Scott & Bruce's (1994) measure of climate for innovation	Dastmalchian's (1986) measure of general organizational climate
4. Self-efficacy	Chen et al.'s (2001) measure of general self-efficacy	Chen et al.'s (1998) measure of entrepreneurial self-efficacy
5. Innovation orientation	Farmer et al.'s (2003) measure of creativity	Jackson's (1994) measure of risk-taking

Table 4. Correlations and Descriptive Statistics (N = 4,364)

Dependent variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Entrepreneurial intentions	1													
Control variables														
2. Gender (Male = 1)	0.14*	1												
3. Age	0.08^{+}	0.05	1											
4. IT experience	0.09^{+}	0.05	0.23**	1										
5. IT Sales & Marketing function	0.16*	0.08	0.09	0.02	1									
6. IT R&D function	0.17*	0.13^{+}	0.07	0.03	-0.20*	1								
7. Education Attainment	0.09^{+}	0.14^{+}	0.14^{+}	0.11^{+}	0.04	0.13^{+}	1							
8. Income	-0.16*	0.11^{+}	0.12^{+}	0.14^{+}	0.13^{+}	0.03	0.19*	1						
9. Year (2008 = 1)	0.02	0.03	0.05	0.01	0.03	0.03	0.01	0.02	1					
Independent variables														
10. Innovation climate	-0.18*	0.02	0.02	0.05	0.01	0.02	0.02	0.04	0.05	1				
11. Technical excellence incentives	-0.17*	0.07	0.04	0.06	0.03	0.04	0.04	0.07	0.01	0.05	1			
12. Innovation orientation	0.14^{+}	0.05	0.07	0.13^{+}	0.05	0.05	0.03	0.12^{+}	0.02	0.09^{+}	0.10^{+}	1		
13. Self-efficacy	0.17*	0.07	0.12^{+}	0.11^{+}	0.04	0.06	0.03	0.13^{+}	0.03	0.05	0.04	0.10^{+}	1	
14. Job satisfaction	-0.32**	0.05	0.09	-0.16*	0.10^{+}	-0.11^{+}	0.05	0.17*	0.03	0.09^{+}	0.08^{+}	0.04	0.05	1
Mean	3.38	0.65	34.69	9.35	0.15	0.11	3.24	2.85	0.04	3.36	3.52	3.55	3.28	3.29
Std. deviation	0.56	0.44	0.73	0.99	0.25	0.23	0.75	0.62	0.56	0.61	0.54	0.59	0.58	0.42

$^{+}p < 0.05$; $^{*}p < 0.01$; $^{**}p < 0.001$

Table 5. OLS Regression Results (N = 4,364)[a]

	Dependent variable - Job Satisfaction			Dependent variable - Entrepreneurial Intentions				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	3.831** (0.334)	3.654**(0.221)	4.009**(0.188)	3.593**(0.165)	3.366**(0.111)	3.775**(0.156)	4.031**(0.192)	4.144**(0.075)
Controls								
Gender (Male = 1)	0.103(0.101)	0.114(0.120)	0.117(0.125)	0.158(0.125)	0.151(0.122)	0.126(0.123)	0.149(0.125)	0.141(0.115)
Age	0.432(0.203)	0.410(0.199)	0.413(0.155)	0.202(0.104)	0.199(0.193)	0.195(0.122)	0.187(0.105)	0.121(0.116)
Age squared	0.319(0.115)	0.282(0.132)	0.295(0.101)	-1.365*(0.109)	-1.178*(0.132)	-1.265*(0.140)	-1.281*(0.102)	-1.293*(0.131)
IT experience	0.554(0.211)	0.531(0.197)	0.512(0.188)	1.103^{+}(0.203)	1.102^{+}(0.171)	1.113†(0.312)	1.125†(0.181)	1.239†(0.212)
IT sales & marketing function	0.131(0.113)	0.221(0.112)	0.165(0.119)	0.115(0.121)	0.153(0.129)	0.231(0.129)	0.136(0.118)	0.205(0.119)
IT R&D function	0.213(0.121)	0.180(0.151)	0.129(0.189)	0.171(0.115)	0.179(0.232)	0.163(0.204)	0.151(0.391)	0.142(0.143)
Education Attainment	-1.687*(0.301)	-1.603*(0.312)	-1.732*(0.353)	1.277*(0.264)	1.281*(0.193)	1.323*(0.213)	1.240*(0.184)	1.250*(0.171)
Income	1.457*(0.162)	1.469*(0.152)	1.501*(0.160)	-1.631*(0.231)	-1.676*(0.123)	-1.681*(0.126)	-1.674*(0.166)	-1.694*(0.138)
Year (2008 = 1)	0.201(0.213)	0.235(0.233)	0.256(0.213)	0.218(0.199)	0.197(0.162)	0.174(0.201)	0.199(0.233)	0.111(0.148)
Main effects								
Organizational innovation climate		2.115*(0.102)	2.145*(0.182)	-1.135*(0.217)	-1.145*(0.260)			0.317(0.117)
Technical excellence incentives		1.769*(0.212)	1.743*(0.198)	-1.129*(0.294)	-1.209*(0.205)			0.288(0.129)
Innovation orientation		-1.000†(0.336)	-0.972†(0.239)	1.013† (0.152)	1.001†(0.139)			0.193(0.341)
Interactive effects								
Climate X Innovation orientation			-1.911*(0.224)		-1.291*(0.249)			0.410(0.309)
Incentives X Innovation orientation			-1.614**(0.431)		-1.261*(0.332)			0.505(0.254)
Main effects								
Job satisfaction						-1.417*(0.651)	-1.566*(0.322)	-1.519*(0.369)
Self-efficacy						1.141†(0.373)	1.154†(0.231)	1.229†(0.136)
Interactive effects								
Job satisfaction X Self-efficacy							-1.655**(0.215)	-1.629**(0.499)
F-Statistics	8.952**	13.459**	16.839**	9.291**	11.774**	12.731**	13.795**	15.886**
Adjusted R-Square	0.12	0.21	0.29	0.06	0.11	0.15	0.25	0.34
ΔR^2		0.09**	0.08**		0.05**	0.04**	0.10**	0.09**

a – Standard errors are reported in parentheses $^{+}p < 0.05$; $^{*}p < 0.01$; $^{**}p < 0.001$; Two-tailed test