

The Effects of Employee Involvement on Enterprise Innovational Performance: Chinese Evidence

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Abstract: We hypothesize that the effect of employee involvement on enterprise innovational performance is constrained by the degree of company's formalization. Based on the data collected from 127 large and medium Chinese companies, we empirically test this hypothesis. Our results show that without considering the degree of company's formalization, employee involvement plays a positive role in the creation of enterprise business innovation but is harmful to the commercialization of such an innovation. After considering the formality degree, employee involvement is helpful to the commercialization of innovation but harmful to the creation of innovation when formality degree is high, while it is harmful to the commercialization of innovation but helpful to the creation of innovation when formality degree is low. The conclusion of this paper integrates the research results of this issue based on the perspective of organizational behavior and organization theory, enhances the understanding of the meaning of employee involvement in enterprise innovational performance.

Key words: innovational performance; employee involvement; formalization

JEL codes: O31

Along with the development of economy and the intensifying of international competition, innovation has become the necessity of the foundation of enterprises (Isaksen & Lauer, 2002). Since innovation is fundamentally realized by the staff, it is crucial to find the way how to motivate them to participate in the innovational process of the firm. The existing research on this topic has pointed that employees' involvement in enterprise decision process could be a positive force for stimulating their initiatives by which enhances their creativity (Miller, Monge, 1986). However, some studies found that increasing employees' initiative was not sufficient to promote enterprise innovation; apart to which one should focus on some other stimulus including the employees' goal of work, responsibility in work, and the degree of organizational formality (Damanpour, 1991). This paper intends to address the issue about the relationship between the degree of organizational formality and the employees' involvement: how these two factors affect the enterprise innovational performance together? With the data collected from Chinese 2000 large enterprises, some empirical conclusions have been drawn.

1. Theory and Hypothesis

Employee involvement is the process where regular workers frequently participate in how their work is done,

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making suggestions for improvement, goal setting and planning and monitoring their performance, which can be realized by enforcing the enterprise inner communication channel, works redesigning and including employees in enterprise decision, etc. (Lawler, 1988; Fenton-O' Creevy, 2001). Some researchers have found that employee involvement played a positive role in improving products quality, decreasing employee turnover rate, and streamlining the organizational operation (Lawler, 1988), which all enhance the enterprise overall performance (Damanpour, 1991).

However, the positive meaning of employee involvement is constrained by the degree of formality of the organization (Daft, 2003). In a "formalized" company, the organizational rules, the duties and rights of workers and the division of labor have been clearly defined which expect employees to obey with (Khandawalla, 1974; Organ et al., 1981; Hirst, 2011). According to some studies, such a rigid management system impairs employee's initiative and creativity thereby decreasing enterprise innovational performance (Aiken & Hage, 1971). Other opinions believed that a formalized company can decrease the employee's behavioral uncertainty and improve the efficiency of resource integration, by which the enterprise innovational performance can be greatly enhanced. Thus, in studying the meaning of employee involvement for enterprise innovation, we must figure out the relationship between these three factors interacting together. A reasonable hypothesis could be stated that the degree of formality of the organization is the intermediate variable between employee involvement and the firm's innovational performance.

1.1 What Is Innovation and How to Measure It?

Schumpeter (1912) identifies the innovational process as a critical dimension in economic change where production function is modified to enhance its outputs performance. This process not only includes the creation of business ideas, but also counts in their commercialization where business ideas are commercialized into the real products or services which meet the consumers demand (Damanpour, 1991). While business ideas are created during the knowledge exploration, commercialization is the process where the existing knowledge is exploited.

Thus, enterprise innovational process can be classified into two phases: creation and commercialization. Accordingly, enterprise innovational performance can be measured based on these two perspectives. The creation performance refers to the ideas creation which can be measured, for example, by the number of patents application and the creative projects, while the commercialization performance refers to how the ideas created increase the business performance measured by the increase of financial return and costumers.

1.2 Employee Involvement and Ideas Creation

The early researches defined employee involvement as the employee involvement in enterprise decision (Mitchell, 1937). With the accumulation of management practices, the intension of employee involvement has been broaden to which includes not only the creative suggestions came up by the employees (Jesu's A' ngel del Bri'o et al., 2007), but also emphasizing the employee communicational position within the firm (Annette Cox et al., 2009), which fundamentally stresses the relation between employees and their autonomous power in their work.

We hypothesize that the degree of employee involvement would affect the ideas creation in a positive way. Ideas creation is characterized by its openness and originality, which is difficult to be gendered in the formalized operational process and existing enterprise logical system and need the break of existing rules and normative behaviors (He & Wong, 2004). In an organizational system where every behavior is clearly defined which make employee needn't to exercise their autonomous power during their works, rules breaking process could be difficult. This problem can be ameliorated by increasing the degree of employee involvement (Cotton, 1993). By motivating employee expressing and involvement management (Jesu's A' ngel del Bri'o et al., 2007), company

can expand its information source by which enhance the process of knowledge integration, which promotes the ideas creation (Dreu & West, 2001). Furthermore, the employees in the first line of operation have lots of one-hand experience and information. The communication between employees therefore is crucial to the knowledge integration, which could be enhanced in organization stressing the employee involvement.

The first hypothesis waiting for test, therefore, can be stated as follow:

H1: employee involvement promotes the creation of business ideas

1.3 Employee Involvement and Ideas Commercialization

Commercialization of business ideas is a complex process requiring different conditions for its different phases. First of all, realizing business ideas by producing products and services requires resources input. Secondly, the division of labor is also crucial. Materializing business ideas not only need the individual work, but also the cooperation between different employees. Therefore, during the process of business idea commercialization, the key is no long the way to motivate innovation, but the way how to commercialize the existing innovation in the most efficient way which asks for the efficient allocation of organizational resources and a fluent division of labor (Ducan, 1976; Daft, 2003).

Constrained by the transaction cost, the task of commercializing business ideas is hard to be accomplished solely by the autonomous work of employees. It requires the planed labor division and resource allocation (Daft, 2003), which may impose strict rules on employee work. The meaning of employee involvement therefore is no longer as important as it in the process of ideas creation. Accordingly, the autonomous power of employee should be narrowed down in case of the decrease of enforcement efficiency (He & Wong, 2004). The following hypothesis intends to test the above deduction:

H2: employee involvement impair the commercialization of business ideas

1.4 Organizational Formalization and Employee Involvement in Ideas Creation

Organizational formalization is the important way to streamline the business operation by defining the employee specialization, hierarchical border and the formality of the work in order to improve the operational efficiency, where specialization defines the horizontal labor division, hierarchy defines vertical labor division, and formalization defines the clarity of horizontal and vertical labor division. In practice, the degree of organizational formality should be defined by the clarity, definitiveness and detail level of the rules and charters (Pugh, Hickson, Turner, 1968).

A higher level of formalization is detrimental to the original ideas creation (Hlavacek & Tompson, 1973). The strictly defined rules and regulations is an obstacle to the change of operational method (Tata & Prasad, 2004; Wrzesniewski & Dutton, 2001) and impairing the initiative of employee. A rigid relationship between different workers could also impede the vertical and horizontal employee communication (Hempel, 2009). These effects, however, could exercise a complex influence on employee involvement during the innovational process. In highly formalized company, employees have the defined rules directing their works. In this situation, when they are empowered with great discretion about their works, they may find inconsistency in the rules and the actions they take, which increase the coordination cost, therefore affect the innovational process negatively (Levine & Tyson, 1990). In contrast, in a less formalized company, labor division and specialization is defined loosely and the communication channel is diversified. In this case, increase the level of employee involvement may be helpful to spark business ideas.

H3: employee involvement promotes the creation of business ideas when company is less formalized, while impairs the creation of business ideas when company is highly formalized.

1.5 Organizational Formalization and Employee Involvement in Ideas Commercialization

During the process of ideas commercialization, employees should rely on the formalized management information system to materialize the ideas created before to realize its financial meanings. Since the level of rationalization of labor division and coordination is much more important in this process compared to the process of ideas creation, we suggest that formalization could be a positive role in this process. First of all, a clarified work direction is helpful for workers to achieve the organizational purpose (Simon, 1947). Secondly, a formalized labor division can promote the coordination of different employees and therefore increase the synergy efficiency. Thirdly, formalized organizational purpose can direct the employee expectation and decrease the perceived uncertainties (Bunderson & Boumgarden, 2010). Thus, we hypothesize that in a highly formalized company, employee involvement can be coordinated much efficiently which promotes the process of transferring business ideas to commercial products and services; in a less formalized company, the coordination of work which plays a significant role in commercializing business ideas would not be impaired by the spontaneous employees involvement.

H4: employee involvement promotes the commercialization of business ideas when company is highly formalized, while impairs the commercialization of business ideas when company is less formalized.

2. Method

2.1 Samples

We collected data at the firm level. Surveys were sent to 1,000 firms of IT industry of different ownership and across the developed and developing areas in China. The companies were sampled from publicly listed organizations, large organizations' directory, and member lists of technology associations of different provinces. The companies were mostly large organizations with an annual revenue of 20 million RMB or above. During April to July 2011, surveys with instructions for administrations were packaged and mailed directly to the head office of each company. To ensure accuracy, reliability, and confidentiality of data administration, we requested that each company contact the researcher directly to further discuss the administration procedure.

To reduce common method bias (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003), we used multiple sources of data. First, we collected archival data on the innovation indicators of organizations, which were provided by the finance department. Second, we employed multiple sources for survey administration. Specifically, the human resources/personnel administration department head completed the measures on bureaucratic structure and high involvement HR practices, while the CEO/general manager was responsible for answering the external social network measures. We finally had useable data from 127 companies, with a response rate of 12.7%. This is within the range of normal response rate of 6%-28% for company-level data collection (Becker & Huselid, 1998).

Of all responding companies, 26% were state-owned companies, 26.8% were foreign investment or joint-ventures, and 46.5% were private companies. Average company size was 10,646 employees. Average company age was 17.51 years ($SD = 12.96$); average revenue generated in 2009 was 116.89 million RMB ($SD = 48.17$ million).

2.2 Measures

2.2.1 Firm Innovation

We measured the innovation outcomes in 2010 using the number of patent generated, and the revenue

generated from new products/services. The former represent the firm's generation of new invention (Narin, Noma, & Perry, 1987), while the latter describe the success of commercializing the new innovation (Song & Parry, 1996; Yoon & Lilien, 1985).

2.2.2 Employee Involvement

Based on the previous conceptualization and operationalization of employee involvement (Lawler, 1992), we measured high involvement HR practices using 4 items, including "cross-functional teams", "formal employee suggestion mechanisms", "employees right to make suggestions using information systems", and "job rotation opportunities". The response scales were 0 (no) to 1 (yes). The sum of all four items was used as the score of the scale, with a range from 0-4.

2.2.3 Formalization

We measured Formalization in terms of the articulating of goals and structuring of work (Bunderson, 2010). Specifically, items included "job description", "work standard", "MIS which covers all function", "the regulation carried out by top managers". Response scales were 0 (no) and 1 (yes). The scale score was the sum of all five items, with a range from 0 to 4.

2.2.4 Control Variables

Previous innovation research has shown that many factors may influence innovation performance of organizations (Crossan & Apaydin, 2010; Damanpour, 1991). As such, we control for several factors that may have a significant impact in the Chinese context. Prior research suggested that the company type (including state-owned, foreign investment, and private companies) had a significant impact on Chinese organizations' innovation outcomes (Li, Guo, Liu & Li, 2008; Wang & Zang, 2005). As such, we created two dummy variables for state-owned and private companies. Consistent with previous research (e.g., Damanpour, 1996), we also controlled for organizational size (number of employees), and organizational age (lg value). In addition, the previous year's performance and investment on R&D may have an impact on innovation outcomes in the current year (Zahra & Nielsen, 2002). Thus, we controlled for the company's total asset, revenue, and R&D investment, which were based on archival data.

2.2.5 Reliability

We examined the reliability by split-half, instead of the common Alpha, as the scale were 0 and 1 (Jime'nez, 2005). The results showed that the split-half value were about 0.7, which is acceptable.

3. Results

Hierarchical regression was used to examine our hypotheses. To avoid multicollinearity between the predictors and the interaction items and to enhance the interpretation of the main effects, we centered all variables involved in the interaction testing models (Aiken & West, 1991).

Table 1 reports the means, standard deviations, and zero-order correlation coefficients among the study variables in IT industry.

The control variables were entered into model 1, followed by employee involvement and formalization into model 2 (see Table 2 for detail). After controlling for the effects of age, size, high-tech status and innovation investment, employee involvement were positively associated with number of patents authorized. The finding provided support for Hypotheses 1. Moderated hierarchical regression was used to test Hypothesis 3. As Model 3 indicated, the interaction between the two factors was negatively associated with firm number of patents.

Table 1 Means, Standard Deviations, and Correlations of Variables

	Mean	S.D.								
Firm age	2.71	0.526								
Firm size	3.35	0.681	0.15							
Revenue	5.29	0.65	0.114	0.799**						
Number of people in R&D department	2.45	0.647	0.085	0.887**	0.686**					
R&D investment	3.41	0.656	-0.056	0.467**	0.678**	0.555**				
Employee involvement	1.13	0.57	-0.113	0.205*	0.142	0.221*	0.08			
Formalization	4.02	0.967	0.065	-0.136	-0.123	-0.051	-0.097	-0.006		
patents	1.25	0.66	-0.016	0.590**	0.603**	0.569**	0.420**	0.386**	-0.31**	
Sales of New products	4.99	0.676	0.106	0.729**	0.938**	0.639**	0.788**	0.114	-0.104	0.492**

Note: N = 179;

All the control and dependent variables are in standardized logarithmic form

P < 0.05, **: P < 0.01

Table 2 Regression Analyses of Employee Involvement in Predicting Outcomes

	Dependent variables					
	patents			Sales of New products		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control variables						
Firm age	0.079	0.110	0.103	0.025	0.01	0.02
Firm size	0.139	0.053	-0.014	-0.034	0.066	0.182
Revenue	0.116	0.093	0.080	0.787**	0.796**	0.850**
Number of people in R&D department	-0.156	-0.120	-0.037	0.00	-0.054	-0.194*
R&D investment	0.280	0.295*	0.285*	0.237**	0.221**	0.217**
Predictors						
Employee involvement	-	0.173*	0.804*	-	-0.083*	-0.816**
Formalization	-	-0.065	0.247	-	0.076*	-0.285**
Interactions						
EI * formalization	-	-	-0.663*	-	-	0.797**
R2	0.136**	0.169	0.192*	0.898**	0.908**	0.933**
F	3.304	3.001	3.033	159.772	126.113	152.284
ΔR2	-	0.033*	0.023	-	0.011**	0.024**
ΔF	-	2.073	2.874	-	5.189	31.633

Note: *: P < 0.05, **: P < 0.01.

Based on the same procedure, the Model 4, Model 5 and Model 6 presented results for testing Hypothesis 2 and 4. The main effect of employee involvement on idea generation performance was significant and positive. The interaction between the two factors entered in Model 6 was positively related to dependent variables, which was also consistent with Hypothesis 4.

To specifically illustrate the direction of the interaction mechanism, we followed the procedures suggested by Aiken and West (1991). Since the main effects of employee involvement on dependent variables were robust, we set formalization as a moderator. As shown in Figure 1 and Figure 2, for high levels of formalization, the employee involvement was positively associated with innovation commercialization, while negatively associated with generation of innovation. However, when formalization is lower, the situation is reversed. These results were consistent with Hypotheses 3 and 4.

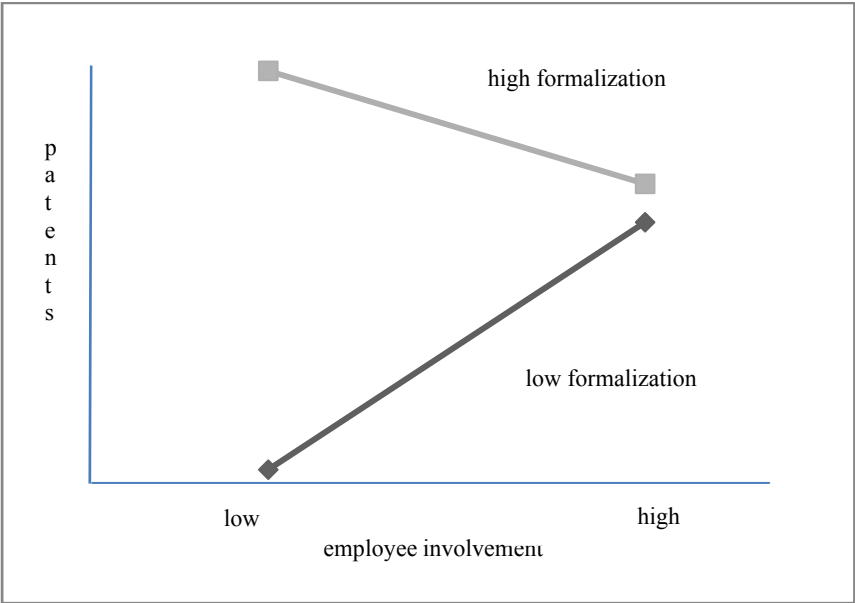


Figure 1 The Interaction between EI and formalization in Predicting Patents

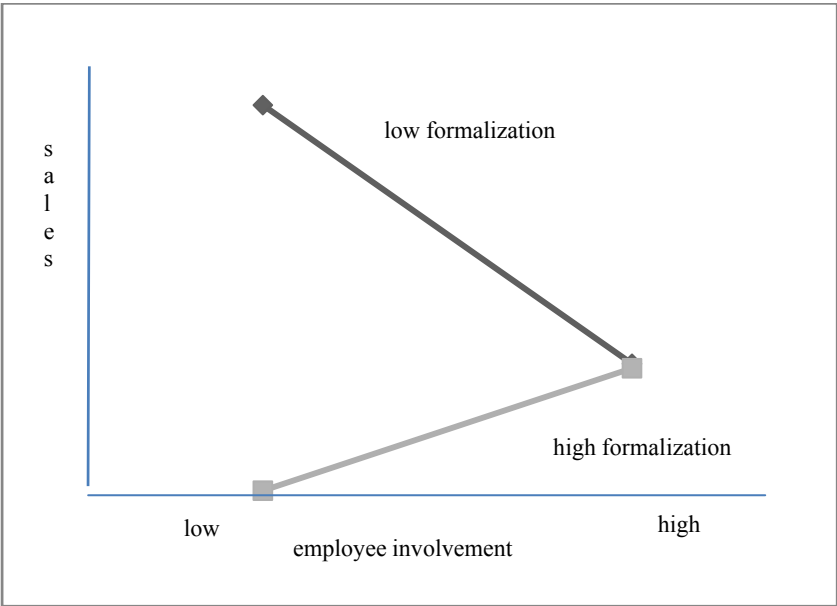


Figure 2 The Interaction between EI and formalization in Predicting New Products Sales

4. Discussion

Our study contributes to the literature by examining the influence mechanisms of employee involvement on different phase of innovation and the interact effect between employee involvement and formalization. First, we demonstrated the positive effects of EI on ideas creation and the negative of it on commercialization. Second, we found significant interactions between the employee involvement and formalization. This is consistent to our hypotheses (H3 and H4), which predicted a complicated relation between the two factors. We will elaborate on this finding in the discussions below.

4.1 Theoretical Implications

First, our work was among the first to examine the impact of EI on different phase of innovation on Chinese background. The results proved the fitness of the ambidextrous theory of innovation in china.

Second, by analyzing the interaction between EI and formalization, we go further in the searching of mechanism of employee involvement. This work provides researchers with important tips, which remind them of the different types on involvement.

Third, compared with the former research, we measured the innovation performance by archival data. This measurement is more credible and convincing.

4.2 Practical Implications

The results of the current study only tell the firms that the employee participation is the catalyst on innovation. However, for the companies which want to gain competitive advantages by innovation, they need to know that employee participation is not the “catholicon”. When a firm fully utilize their employee without formal control system, people may just get lose. Especially for the commercialization phase of innovation, the “formal involvement” is necessity.

4.3 Study Limitation and Future Research

Due to this study is focused on Chinese large enterprises, not involved in small and medium-sized enterprises and foreign enterprises, therefore the conclusion of the study has limitations. Secondly, the conclusion of the study mainly through the electronic information industry data to prove it, the other industry situation failed to directly support the conclusion. In third, the measurement of employee participation and organizational formalization are through the original data integration, making reliability and validity has yet to be further improved.

5. Conclusion

By distinguishing the different phases of firm innovation, we discussed the impact of employee involvement on firm innovation, and found that the results depend on the levels of formalization. As a main factor, the higher employee involvement is positively related with the generation of innovation, while hamper the commercialization. However, considering the formalization, the situation is more than that. For high levels of formalization, the employee involvement was positively associated with innovation commercialization, while negatively associated with generation of innovation. When formalization is lower, the employee involvement was positively associated with idea generation, while negatively associated with commercialization.

Based on our findings, we suggest that firms can be innovative not only by employee involvement, but the formalization. The employee involvement can't be seen as the main factor of innovation, as formalization be moderator. A company needs the balanced combination of this two, taking into consideration the different phase of innovation.

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