

# Research on Relationship of Heterogeneity of Management Team and Tacit Knowledge for Companies after Merger and Restructuring\*

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**Abstract:** As the industrial structure adjustment accelerates the pace of company merger and restructuring, the improvement of level of management team becomes an important issue to be studied currently. The internal matching of heterogeneity of management team may exert crucial importance on the management level of the team, but the level of management may be subject to the level of tacit knowledge of managers. This paper proposes a model about general heterogeneities and special heterogeneities of those members and the level of tacit knowledge, and then carries out the research on those companies with such a result that the heterogeneity of age, professional and education, etc may correlate with level of tacit knowledge positively, but the heterogeneity of service term may exert unfavorable influence on the level and capacity of tacit knowledge on managing others.

**Key Words:** Team heterogeneity; Tacit knowledge; Level of management of team

## 1 Introduction

Industrial structure adjustment shall be an essential issue for economic development of all countries; therefore, the pace of company merger and restructuring is speeding up due to the accelerated adjustment of industrial structure and optimization and upgrading of industrial structure. Hence, issues on personnel restructuring and knowledge integration cannot be avoided. However, in the restructuring and integration of management team, its level may be improved by means of improving the spillover of knowledge, especially of the tacit knowledge. Michael Polanyi (1966) believed that tacit knowledge should be a kind of highly individualized knowledge which might be hard to be formalized, communicated and shared with others, exist in form of individual experience, intuition, impression, perception and skill or organizational culture, etc, and might be learnt by means of cooperative experience<sup>[1]</sup>, and the level of management of the team should be bound up with the tacit knowledge. After the merger or restructuring of a company, since the members of management team may come from different departments and there may be changes in ages, education backgrounds, professionals and experiences, the regrouped team may have different knowledge backgrounds, skills, experiences and specialties. The matching of the heterogeneity of team members shall be the basis for the realization of spillover of tacit knowledge and the achievement of team synergies and better performances and have great significance in the implementation of organizational strategy as well as the integration and growth of management team.

Most those researches on team heterogeneity laid emphasis on the relationship of visible differences and potential differences of team members with team performance. There are also considerable amount of researches on the relationship between member heterogeneity and tacit knowledge internationally, but few domestically. This paper is try to fill up this gap in such a manner of establishing a model of member heterogeneity and tacit knowledge level of managers with merger and restructuring of companies as background so as to reveal the relationship between the internal matching of heterogeneity and management level.

## 2 Theory and Assumption

### 2.1 Team heterogeneity

Team heterogeneity refers to the differences of personalities, sexes, attitudes, backgrounds and experiences of team members and their distributions, all of which may result in different opinions among members<sup>[2]</sup>. The member heterogeneity covers many dimensions, such as that of gender, age, years of working, professional background (including degree) and occupational experience. The above five types of heterogeneity shall be those frequently adopted in previous researches<sup>[3,4]</sup>. However, this

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paper is to adopt the division of member heterogeneity by Zhang Zhang and Xiong Li<sup>[5]</sup> for the researches on those general heterogeneities of sexes, ages, years of working which may show features of demography as well as those special heterogeneities of professional backgrounds, education, occupational experiences which may mirror the knowledge accumulation conditions and tendencies of their thinking<sup>[6]</sup>.

## 2.2 Tacit knowledge of managers

Wagner (1987) came up with a three-dimensional structure for tacit knowledge of working as its basic structure based on empirical studies, which might be content of knowledge, situation of knowledge and positioning of knowledge; the content of knowledge should contain the management of oneself, the tasks and others; the situation of knowledge include partial situation and overall situation; and the position might refer to the positions of idealism and realism<sup>[7]</sup>. Then, based on this, Wagner and Sternberg developed the Tacit Knowledge Inventory, applicable for different areas. TKIM, Tacit Knowledge Inventory for Managers, the earliest inventory by Wagner and Sternberg, etc, which is published by PSI, Psychological Services, Inc, is widely used in researches with respect of tacit knowledge of managers. Tang Kexin, taking the TKIM as the object to be revised, has prepared another TKIM which is especially suitable for actual conditions of China<sup>[8]</sup>.

## 2.3 Team heterogeneity and tacit knowledge

Those researches on managers represented by Sternberg shows that: tacit knowledge is in medium correlation with experience (0.20-0.40)<sup>[9]</sup>; the more management experiences the managers have and the higher the positions are, the more tacit knowledge they may possess<sup>[10]</sup>; and the tacit knowledge is significantly correlates with lots of aspects of successful management<sup>[9,12]</sup>, including performance level ( $r=0.56$ ,  $p < 0.05$ ), welfare, positions, degree of satisfaction about work ( $r = 0.23-0.29$ ) and test result of management potential <sup>[11]</sup> ( $r = 0.26$ )<sup>[9,12]</sup>; in another research, tacit knowledge and the compensations of managers and positions at company are notably correlated, which are 0.39 and 0.36 respectively<sup>[13]</sup>. Lian Xu, Che Hongsheng and Tian Xiaoxun (2007) found that the tacit knowledge correlated less with years of working and years of management work but it was the other way around for the tacit knowledge on self management and years of management working significantly<sup>[14]</sup>. Therefore, this paper makes the following assumptions:

*Assumption a: The heterogeneity of gender of team members does not correlate with level of tacit knowledge of managers significantly.*

*Assumption 1b: The heterogeneity of age of team member correlates with the level of tacit knowledge on managing others negatively.*

*Assumption 2b: The heterogeneity of age of team member correlates with the level of tacit knowledge on self management positively and significantly.*

*Assumption 3b: The heterogeneity of age of team member correlates with the level of tacit knowledge on management tasks positively and significantly.*

*Assumption 1c: The heterogeneity of service term of team member correlates with the level of tacit knowledge on managing others negatively.*

*Assumption 2c: The heterogeneity of service term of team member correlates with the level of tacit knowledge on self management positively and significantly.*

*Assumption 3c: The heterogeneity of service term of team member does not correlate with the level of tacit knowledge on management tasks significantly.*

*Assumption 1d: The heterogeneity of education background of team member correlates with the level of tacit knowledge on managing others positively.*

*Assumption 2d: The heterogeneity of education background of team member correlates with the level of tacit knowledge on self management positively.*

*Assumption 3d: The heterogeneity of education background of team member correlates with the level of tacit knowledge on management tasks positively.*

*Assumption 1e: The heterogeneity of professionals of team member correlates with the level of tacit knowledge on managing others positively.*

*Assumption 2e: The heterogeneity of professionals of team member correlates with the level of tacit knowledge on self management positively.*

*Assumption 3e: The heterogeneity of professionals of team member correlates with the level of tacit knowledge on management tasks positively and significantly.*

*Assumption f: The heterogeneity of occupational experiences of team members correlates with the level of tacit knowledge of managers positively.*

Theoretical Model Diagram of this paper is as Figure 1.

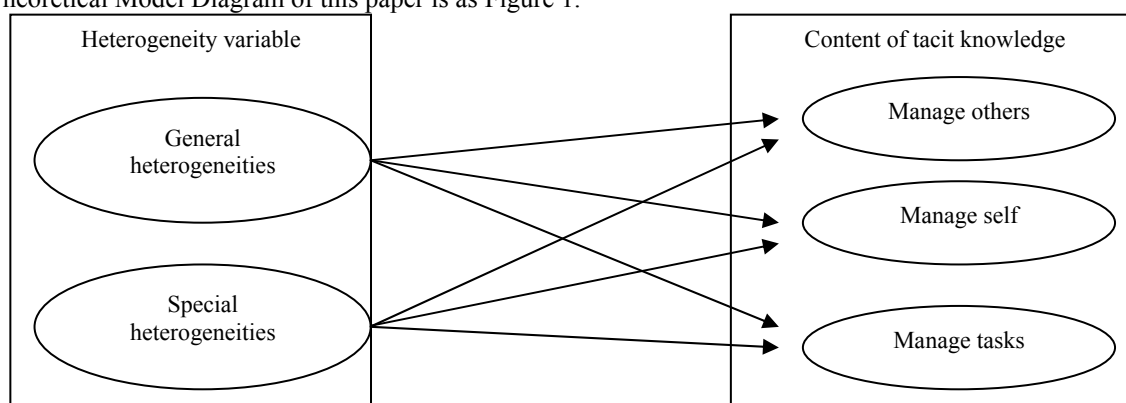


Figure 1 Theoretical Model

### 3. Research Method

#### 3.1 Procedure of survey and structure of sample

Questionnaire survey has been done on the management team of companies after merger and restructuring, such as Shandong Lai'gang Group and Henan Shenhua Group, and effective data on 76 management teams has been gotten. A lot of methods have been applied for the research, including questionnaire, in-depth interview and questionnaire for training classes. The questionnaire is designed with multiple choices for basic personal information and as Likert 7-rating scale for other options. Description of sample characteristics is as Table 1.

Table 1 Sample Characteristics (N=76)

Item		Quantity	Percentage	Item		Quantity	Percentage	
Gender	Male	62	81.6	Post	Local leaders	38	50.0	
	Female	14	18.4		Middle leaders	28	36.8	
Age	Under 30 years of age	51	67.1		Professional background	Manufacturing	46	60.5
	30-40 years old	25	32.9	Administration		24	31.6	
	Work Experience	More than 4 years	28	36.8		Financial	4	5.3
1-2 years		18	23.7	Accounting		2	2.6	
Under 1 year		14	18.4	Professional		Economic Management	36	48.5
2-3 years		8	10.5		Science and Engineering	28	33.3	
3-4 years	8	10.5	Other	12	18.2			
Education		Undergraduate	51	67.1	Education	Undergraduate	51	67.1
		Specialist	18	23.7		Specialist	18	23.7
		Following high school	7	9.2		Following high school	7	9.2

#### 3.2 Design and measure of variables

(1) Explained variable and its measure. Explained variable refers to the tacit knowledge of the management team of companies. According to the empirical study, tacit knowledge is the best predictive index to manifest the performance of managers and is of vital importance for the success of real work, and also the mastering of tacit knowledge is closely related to one's success<sup>[7,15,16]</sup>. Therefore, this paper adopts the scores in tacit knowledge test as a meaningful and independent indicator to measure the management performance of management teams. It gives consideration to the content dimension of TKIM only and divides the evaluation indicator of manager tacit knowledge into three sub-indicators, namely management of oneself, management of tasks and management of others. For the evaluation of

the sub-indicators, Likert's seven-point method is adopted, that's to say, the scores ranges from one to seven. In order to ensure its effectiveness and the consistency of content, the study adopts the revised TKIM which is in accordance with the reality of China, and if all the internal consistency coefficients are 0.50 or larger based on the reliability identification, then the entire inventory has relatively high reliability. Descriptive statistical analysis of the tacit knowledge of the company management teams investigated is as Table 2.

**Table 2 Descriptive Statistical Analysis of the Tacit Knowledge of the Company Management Teams(N=76)**

Index	Mean	Std. Deviation
Manage others	4.46	0.87
Manage self	4.55	0.60
Manage tasks	4.62	0.66

(2) Explanatory variables and their measure. There are six explanatory variables involved in this research, which are heterogeneity of gender, of age, of service term, of education background, of profession and of occupational experience respectively. Herfindal – Hirschman index is adopted in the

measurement of the heterogeneity of team members and its formula is  $H = 1 - \sum_{i=1}^n p_i^2$ , where  $p_i$  refers to

the proportion of i-type staff to the whole team and n stands for the number of types. The value of H shall range from 0 to 1, and the lower the value of H is, the lower the heterogeneity will be. Average value of heterogeneity of the company management team engaged is as Table 3.

**Table 3 Average Value of Heterogeneity of the Company Management Team**

heterogeneity	gender	age	service term	education	profession	occupational experiences
Mean	0.30	0.44	0.75	0.49	0.62	0.53

### 3.3 Analytical method

SPSS 16.0 software is adopted to conduct descriptive statistics and correlation analysis.

## 4 Empirical Test and Results of Analysis

### 4.1 Empirical test

Pearson analysis mode is adopted for the analysis on the relationship heterogeneity of gender, of age, of service term, of education background, of profession and of occupational experience of team members with the level of tacit knowledge, and its result is shown as Table 4. Assumption a, 2b, 3b, 1c, 3c, 1d and 3e are supported; the change of direction of coefficients of assumption 1b, 2c and 2e is in consistency with the assumption but fail to pass significance test; assumption 2d, 3d, 1e and f is not tenable.(see Table 4)

**Table 4 The Result of Pearson Correlations**

	manage others	Manage self	manage tasks
heterogeneity of gender	-.018	.133	.151
heterogeneity of age	-.206	.327**	.264**
heterogeneity of service term	-.295*	.118	.095
heterogeneity education background	.220*	-.123	-.109
heterogeneity of profession	-.065	.110	.204**
heterogeneity of occupational experience	-.155	-.092	-.171

\*\* Correlation is significant at the 0.05 level, \* Correlation is significant at the 0.1 level.

### 4.2 Results analysis

Self-management means the self-motivation and self-organization of managers in aspects related to performance under circumstances relevant to work; management of tasks means that the managers know how to manage the specific work tasks in real work; and management of others means that the managers supervise their juniors and handle their relationship with colleagues and superiors well. The result of the study indicates: Age heterogeneity is in significant and positive correlation with tacit knowledge level ( $r=0.327$ ,  $0.264$ ,  $p < 0.05$ ) in management of oneself and management of tasks; and it is in negative correlation with tacit knowledge level ( $r=-0.206$ ) in management of others. Generally speaking, managers at the same age have similar experience and values, therefore, their communication is easier

and their relationship is more harmonious; while management team with a big age difference may come into conflict due to the difference of values, thus the cohesiveness of the team may decrease; however, the cooperation among managers at different ages can realize the advantage complementation and self-motivation in work: the young may be perceptive and daring, but lack of relevant skills and experience; while the middle-aged are in the full vigor of life and bent on making progress; and the old have rich experiences and broad horizon, however, no enough energy. They have clear understanding of the advantages and disadvantages of themselves, therefore, when faced with difficulties in work, they can easily realize mutual assistance and bring about team cooperation effect. (2) Heterogeneity of service term is in negative correlation with tacit knowledge level ( $r=-0.295$ ,  $p < 0.1$ ) in management of others. A management team with members having different service terms can form diversified views based on the rich company experience and social experience of members, which can help to improve the team's capacity in solving problems to a certain degree; however, if this heterogeneity of members is great and the members don't know each other well, there may easily be conflicts which are difficult to solve, thus it is bad for building up good interpersonal relationship. (3) Education heterogeneity is in positive correlation with tacit knowledge level ( $r=0.220$ ,  $p < 0.1$ ) in management of others. Different education background may bring about richer social resources of relationship and better external and internal interacting atmosphere; (4) Profession heterogeneity is in significant and positive correlation with tacit knowledge level ( $r=0.204$ ,  $p < 0.05$ ) in management of tasks. Different profession background means different thinking modes. When members of different profession background work together, they can provide each other with wider social eyesight and more advanced social dynamic state, and they may also bring forth in-depth views on certain matter from different points as well as make valuable predication about the circumstances that may occur during the work before they begin to work. The last point to be noted is that professional experience heterogeneity is in negative correlation with all management aspects of tacit knowledge ( $r=-0.155$ ,  $-0.092$ ,  $-0.171$ ,  $p > 0.1$ ), which is different from what we expect. The reason for this is probably that professional experience means different cognitive modes. After the merger and restructuring of the company, the values, thinking mode, etc. of the members can't be changed in a short time and the team hasn't achieve an excellent integration, thus the members are not willing to share their own tacit knowledge.

## 5 Conclusion

Through the analysis above, the following conclusions can be arrived at: (1) among the general heterogeneity of the composition characteristics of management teams, age heterogeneity is of significantly positive influence on improvement of the team's level and capacity in management of oneself and management of tasks while tenure heterogeneity may exert bad effects on the tacit knowledge level and the capacity in management of others. (2) Among the specialty heterogeneity of the composition characteristics of management teams, profession heterogeneity is of significantly positive influence on improvement of the team's level and capacity in management of oneself and management of tasks while education heterogeneity may exert positive effects on the tacit knowledge level in management of others.

The inspiration for the merged companies of this study includes: (1) After the merging and restructuring of the company, the construction of the management team itself should experience a periodic procedure from organization, turmoil, regulation to enforcement, rest and reorganization. To structure a reasonable and effective management team, the company should pay attention to the reasonable organization of members so as to optimize the application of the team's tacit knowledge and realize the matching of the diversified knowledge and the skills of team members. (2) It is an important source of the company's core competitiveness and also the inevitable choice of management team to cope with the turbulent environment to improve the tacit knowledge level of the management team. In order to strength the learning and management of tacit knowledge, the company should optimize the knowledge structure of the team from the aspects of age, tenure, education and profession heterogeneity, accelerate the transferring of tacit knowledge, thus realizing the intensification of the dynamic information and knowledge of management team members, improving the management efficiency and achieving management cooperation.

This study also has limitations as follows: (1) This study doesn't differentiate the ownership of the merged and restructured companies and their development stages and it is necessary to make a deep study on companies of different ownership and in different development stages. (2) This paper studies on the relationship between general heterogeneity and tacit knowledge level and the relationship between

specialty heterogeneity and tacit knowledge level only, and it hasn't given consideration to the reciprocal effect of the two kinds of heterogeneity. (3) The data of this paper is from merged and restructured companies, thus its conclusion is not suitable for all companies. These limitations may influence the conclusions of this paper, therefore, this paper is yet to be complemented and perfected in the afterward research.

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