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The Theoretical Analysis Model and Statistical Test Research on Enterprises Development----A Study of Data from 195 Large and Medium Manufacturing Enterprises in China

Abstract. On the basis of dynamic capabilities theory, this paper has put forward the theoretical analysis model and examined questionnaire data from 195 large and medium manufacturing enterprises in 2011 through statistical test methods including intermediary role term and SEM model. The results are as follows: first, in the test for basic constructs, the correlation of independent and dependent variables Sig. <0.001 and Pearson coefficient>0.500, all multiple correlation coefficient > 0.800, all determination coefficient R2 >0.650, Durbin-Watson coefficient approximated to 2.000, all check coefficient has presented distinct character, the whole regressive model explained variation achieved significant standard and all hypothesis have passed the statistical test. Secondly, during the tests for hypothesis with intermediary role term, the regressive coefficient intermediary variable was up to 0.723 and markedly different from 0(Sig. <0.001), the regressive coefficient of organization modularization, intellectual capital and knowledge resource were decreased respectively, determination coefficient R2 increased to 0.889 with significant higher explanation power. It shows that the regressive model with intermediary variable has influenced much on comprehensive regression effect and the hypothesis of intermediary role term have passed the statistical tests.

Streszczenie. W artykule przedstawiono analizę teoretyczną danych ze 195 dużych i średnich przedsiębiorstw produkcyjnych z 2011 roku. Wykorzystano do tego celu testy statystyczne, w tym model SEM. Zamieszczone wyniki pokazują, że zastosowany model regresyjny ze zmiennymi pośrednimi ma duży wpływ na ogólny efekt regresji. Analiza hipotezy o roli pośrednika, na podstawie dokonanych testów, okazała się prawdziwa. (Model analizy teoretycznej oraz badania statystyczne rozwoju przedsiębiorstw – analiza danych 195 dużych i średnich chińskich przedsiębiorstw produkcyjnych).

Keywords: Manufacturing enterprises, Theoretical analysis model, Statistical test, Hypothesis, Questionnaire.
Słowa kluczowe: przedsiębiorstwa produkcyjne, teoretyczny model analizy, badania statystyczne, hipoteza, kwestionariusz.

1. Introduction

Enterprise Growth Theory by Edith Penrose constructs a frame as enterprise resource→enterprise capability→enterprise growth through analyzing enterprise behavior from economics angle. The enterprise growth theory has experienced an evolution process of resource-based view[1]-[3], core competence view[4]-[5], and knowledge-based view[6]-[7] to dynamic capability view[8]-[10]. All these unfold that internal condition has a decisive effect for enterprises to obtain competitive advantage, the accumulation of internal competence, resources and knowledge foster the enterprises to obtain be competitive in market and dynamic capability theory explains the endogenetic impetus of enterprise growth as well as the nature of variation performance among different enterprises[9]. A theoretical analysis model researching the correlation of knowledge resource, intellectual capital, organizational modularity, dynamic capabilities and enterprise growth performance is build. Accordingly, the related hypotheses are tested by statistical methods.
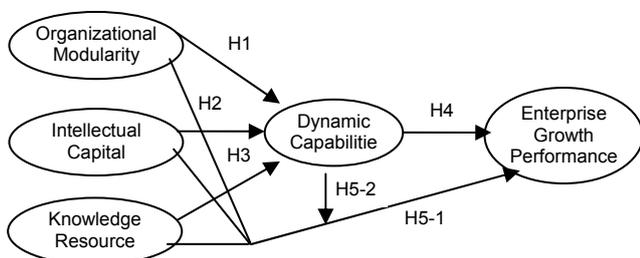

Fig.1. Theoretical Analysis Model

2. Theory and Model Construction
2.1.   Theoretical Background and Conceptual Model

Performance is the phenomenon representation of enterprises capability and dynamic capability is the key for enterprises to obtain competitive advantage and growth performance. The formation of dynamic capability depends on the encoding of experiences, knowledge and organization learning [11], the scarcity and value of knowledge resources influences enterprise growth performance greatly [7],[12], besides dynamic capability proves to be the kernel of knowledge resources' orientation, extension and transformation. Hence, this paper depicts a research frame like Knowledge Resource →Dynamic Capabilities→Enterprise Endogenetic Growth which contains these five constructs such as Organizational Modularity, Intellectual Capital, Knowledge Resource, Dynamic Capabilities and Enterprise Growth Performance as well as the correlation of them(Fig.1).

2.2.   Variables Description and Hypothesis

(1) Organizational modularity and dynamic capabilities. Dynamic capability is a process of enterprise intergration, reconstruction, resources obtaining and release responding to changes in the market thus to realize new resources configuration strategy and organization routine[11]. Loose coupling provides keen perception mechanism for organizational modularity while increasing organi-zation module is the process separating organization routine and strategy management[13]. Therefore, we put forward the following hypothesis: H1, organizational modularity has a positive effect on dynamic capability. H1a, organization speciali-zation has a positive effect on dynamic capability; H1b, organization standardization has a positive effect on dynamic capability; H1c, decesion liberalization has a positive effect on dynamic capability; H1d, interface rule has a positive effect on dynamic capability.

(2) Intellectual capital and dynamic capabilities. Intellectual capital is divided into human capital, structure capital and relationship capital. The resources, skill configuration and learning mode of current and new created enterprises are influenced by human capital distinctively [14],[15]. Relationship capital fosters dynamic capabilities through the integration of learning and knowledge[16]. Structure capital is collaboration and integration mechanism, enhancing internal integration ability[17]. Thus the following hypothesis are proposed: H2: Intellectual capital has a positive effect on dynamic capability. H2a,

human capital has a positive effect on dynamic capability; H2b: structure capital has a positive effect on dynamic capability; H2c: relationship capital has a positive effect on dynamic capability.

(3) Knowledge resource and dynamic capabilities. The implying knowledge and skills is difficult to study and reproduce [9], and so we could obtain steady collective activity model to realize experience accumulation, knowledge description and knowledge encoding by learning. On the basis of knowledge evolution and linked by organization learning, dynamic capability can achieve standardization towards organization aspect through organization learning and new knowledge creation [18]. The hypothesis are as follows: H3: Knowledge resource has positive influence on dynamic capability. H3a, the scope of knowledge has positive influence on dynamic capability; H3b: the depth of knowledge has positive influence on dynamic capability; H3c: the concerntration of knowledge has positive influence on dynamic capability; H3d: organization learning has positive influence on dynamic capability.

(4) Dynamic capabilities and enterprise growth performance.Dynamic capabilities is analized as perception ability, grasping ability and restructing ability[8],[9],[11]. The perception ability helps the enterprises keep market sensitivity to recognize opportunities; the grasping ability urges quick decision and supporting resources. The enterprise resources adjustment, organization and intergration is impelled by restructing ability. The hypothesis are: H4: Dynamic capabilities have a positive effect on enterprise growthperformance. H4a: perception ability has a positive effect on enterprise growth performance; H4b, grasping ability has a positive effect on enterprise growthperformance; H4c, restructing ability has a positive effect on enterprise growth performance. Based on above hypothesis, we conclude that H1-2-3, organizational modularity, Intellectual capital and knowledge resource have a positive effect on dynamic capabilities; H5-1, organizational modularity, intellectual capital and knowledge resource have a positive effect on enterprise growth performance; H5-2, dynamic capabilities plays medium role among relationship of organizational modularity, intellectual capital, knowledge resource and growth performance.

3. Research Method
3.1. Construct Measurement
On measurement of organizational modularity, Intellectual capital, knowledge resource and enterprise growth performance, we can consult the reference scale proposed by academic literature, such as Table 1.

Table 1. Constructs and Reference Scale Contrast

Term	Reference Scale
Organizational Modularity	Mohr J etal[19], Dewar R. D.etal[20]
Intellectual Capital	Youndt M A etal [21], Bontis N[22], Blyler M etal[23]
Knowledge Resource	Zhang G etal[24], Chul W. Moon[25], Henderson R M etal[26]
Dynamic Capabilities	Teece D J[8,9]；Eisenhardt K M etal [11],Adner R etal[27],Justin J P etal[28]
Enterprise Growth Performance	Delmar etal[29],Gaylen Chandler etal[30]

(1) Organizational modularity. The characters of approxi -mate resolvability are found expression in independence and diversity of sub-systems, the degree of decentralization and participation is high, knowledge and skill of departments is different and irreplaceable, and the standard interface reduces factitious cooperation through the modularization integrating [31].

(2) Intellectual capital. Human capital can be measured by professional standards, willingness to learn, decision to participate and creativity [32]. Structural capital can be measured by information network, database and standard procedure. Relation -ship capital can be measured by the relationship between client, supplier, alliance, government and enterprises.

(3) Knowledge resource. Knowledge which can be divided into knowledge width, knowledge depth and knowledge centralized degree is cognitive foundation of dynamic capabilities [33]. Mutiple knowledge structure is propitious for enterprises to deal with inner and external information more efficiently [34]. Enterprises are initiative to deal with and concentrate on valuable knowledge during the period of absorbing knowledge from external environment.

(4) Dynamic capabilities. From analytical angle of organization process, dynamic capabilities have an indirect effect on enterprise performance through altering operation capability and resource base [35]. Dynamic capabilities can be measured by the generant usualness of specific action[36]. Absorbing capabilities of organization can be measured accurately and effectively through the aboved measuring method.

(5) Enterprise growth performance. Enterprise growth performance can be measured by financial performance, learning and person growing up, satisfaction of market client requriment, inner procedure and administration. In consideration of acquring difficuty of objective data, subjective measuring items which can't effect reliability and validity are applied to measuring enterprise growth performance, measuring cycle can be correctly defined for three years[37]-[39].

3.2. Data Collection
(1) Questionnaire design and test. The basic measurement items are extracted and modified on the foundation of authoritative literature and interviews firstly, and the wording further perfected by scholars. Finally, the questionnaire is pretested to estimate its validity and reliability. The results are satisfactory.

(2) Sample selection and questionnaire delivery & recovery. The investigation entirety is all legal manufacturing enterprises in China, in which large and medium sized enterprises founded more than three years are samples1. 195 effective questionnaires have been received from 983 enterprises in all2, reaching the normal standard with recovery rate 19.84% and data missing rate 1.156%.

(3) Sample information description. In 195 enterprises, super-large ones account for 21.03%, large 34.36% and medium 44.61%. Besides, we adopted statistical classification method to analyse the location, organization form, industry and staff scale of the enterprises.

4. Data Analysis
4.1 Pretest and Analysis
We have delivered seventy-five pretest question-naires to middle high administrators with sixty-six effective answering papers in school of economics and management of Tsinghua unniversity in July, 2011. The project analysis, reliability analysis and validity ananlysis of the five constructs is as follows (Table 2, Table 3 and Table 4).

Table 2. Brief Abstracts of Item Analysis

Item	Group Comparison	Correlation of Item and Total Score		Homogeneity Test			Insufficient Standard Index Number	Result
	Decision Value	Item and Total Score	Correcting Item and Total Score	a value after deleting	Intercommunity Coefficient	Influencing Load		
a2_8	3.585	.441	.387	.928	.198	.446	4	Delete
a3_13	2.341	.425	.363	.928	.156	.395	5	Delete
Criterion	≥3.000	≥.400	≥.400	≤.927	≥.200	≥.450		
b3_16	2.963	.436	.381	.946	.189	.434	5	Delete
Criterion	≥3.000	≥.400	≥.400	≤.944	≥.200	≥.450		

Note: a2_8→ execute written regulation and program strictly; a3_13→ employ or dismiss R & D personnel; b3_16→ obtain policy guidance duly

Table 3. Brief Abstracts of Validity Analysis

Item	Exploratory factors analyzing	KMO Coefficient	Significance Sig	Emerging Nature	Common Factors Number	Explain Variance (%)	Delete Interference Item	Validity Analysis Test Result
Organizational Modularity	6	.787	< 0.05	Medium	4	67.886	5	Reaching the standard
Intellectual Capital	2	.827	< 0.05	Good	3	75.469	1	Reaching the standard
Knowledge Resource	4	.913	< 0.05	Excellent	4	81.531	3	Reaching the standard
Dynamic Capabilities	4	.907	< 0.05	Excellent	3	75.554	3	Reaching the standard
Enterprise Growth Performance	9	.917	< 0.05	Excellent	4	79.451	8	Reaching the standard

Note: method→ principal components analysis & Rotation method----maximum variation method

Table 4. Brief Abstracts of Reliability Analysis

Item	Internal Consistency Coefficient α	Emerging Nature	All Items has been Deleted Cronbech's Elphe	Speermen-Brown discriminant coefficient	Deleted items	Reliability Analysis Test Result
Organizational Modularity	.905	ideal	< .905	.826 > .800	0	Reaching the standard
Intellectual Capital	.945	ideal	< .945	.903 > .800	0	Reaching the standard
Knowledge Resource	.960	ideal	< .960	.926 > .800	0	Reaching the standard
Dynamic Capabilities	.964	ideal	< .964	.936 > .800	0	Reaching the standard
Enterprise Growth Performance	.968	ideal	< .968	.940 > .800	0	Reaching the standard

Note: All Items Has been Deleted Cronbech's Elphe Value< Internal consistency coefficient, all items of the reference scale should be reserved.

4.2. Hypothesis Test and Analysis

(1) The hypothesis Hla, Hlb, Hlc, H1d, H2a, H2b, H2c, H3a, H3b, H3c, H3d, H4a, H4b, H4c, H1-2-3, Hl, H2, H3 and H5-1 are verified by the multiple linear regression analysis. Table 5 presents the results after the multiple linear regression analysis of the one hundred and ninety-five samples with analytical software of SPSS 18.0, wherein the correlation of independent and the dependent variables Sig. <0.001, the Pearson coefficient, the multiple correlation coefficient, determination coefficient R^2, the Durbin-Watson coefficient, the variation amount significance test F and the check coefficient Sig. F value all reach the standard. The whole regressive model achieves significant level according to the convergence criterion.

(2) The hypothesis H5-2 is verified by mutiple linear regression analysis in Table 6. The F value of Model 1 and Model 2 achieve significant level towards Sig.< 0.001(F1=348.282；F2= 377.398), in Model 2 with intermediary variable, the dynamic capability regressive coefficient rises to 0.723 which is markedly different from the standard value of 0(Sig.<0.001), the regressive coefficient of organizational modularity, intellectual capital and knowledge resource is positive and remarkable, but is lower than the value of Model1. R^2 rises to 0.889(Sig.<.001) with increasing explaining power, from which distinctive Intermediary role of dynamic capabilities can be found. In conclusion, the hypothesis H5-2 is supported by empirical test above-mentioned.

Table 5. Brief Abstracts of Multiple Regression Analysis on Six Models

Examination Information	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
The Correlation of Independent and Dependent Variables	Sig.<.001	Sig.<.001	Sig.<.001	Sig.<.001	Sig.<.001	Sig.<.001
Pearson Coefficient	[.574-.713]	[.739-.826]	[.727-.889]	[.870-.890]	[.807-.921]	[.814-.881]
Multiple Correlation Coefficient R	.807	.891	.931	.933	.941	.918
Determination Coefficient R^2	.651	.795	.867	.870	.886	.842
Durbin-Watson Coefficient	2.109	2.228	2.279	2.124	2.030	1.483
Variation Amount Significance Test F	88.771***	246.548***	308.825***	424.991***	491.220***	337.287***
Check Coefficient Sig. F Value	***p.<.001	***p.<.001	***p.<.001	***p.<.001	***p.<.001	***p.<.001
Whole Regressive Model Explained Variation	Significant level	Significant level	Significant level	Significant level	Significant level	Significant level
Assumption Test	H1a H1b H1c H1d	H2a H2b H2c	H3a H3b H3c H3d	H4a H4b H4c	H1-2-3 H1 H2 H3	H5-1

Table 6. Brief Abstracts of Multiple Regression Analysis on Dynamic Capabilities Intermediary Role

Variable	Model 1	Model 2
Constant Term	6.701	-1.274
Independent Variable		
Flexible Organization Module	***.315	*.219
Intellectual Capital	***.573	*.258
Dynamic Capabilities	***.526	*.183
Intermediary Variable		
Dynamic Capability		***.723
Statistics in Regression Model		
R^2	.845	.889
Adjusted R^2	.843	.886
F	***348.282	***377.398
Note: （1）Model 1：the regressive model testing organizational modularity, intellectual capital and knowledge resources' effect on enterprise growth performance. （2）Model2：Model 1 plus intermediary variable;（3）*p<.05 ***p<.001		

4.3.   Control Variable Test and Analysis

Single factor variance analysis is carried out on dynamic capabilities and enterprise growth performance of one hundred and ninety five large and medium manufacturing enterprises. Scale of business (including 1.ultra-large type, 2.large type and 3.medium type enterprises), organization form (including 1.stock cooperative company, 2.limited joint stock company, 3.collective company 4.public company and 5.limited liability company), administrative area (including 1.northeast China, 2.north China, 3.east China, 4.south China, 5.central China, 6.northwest China and 7.southwest China), industry (including 1.electric machinery and equipment manufacturing industry, 2.textile and clothing industry, 3.black and non-ferrous metal smelting and rolling processing industry, 4.chemical fiber, plastics and rubber products industry, 5.manufacture of transport equipment, 6.metal products industry, 7.petrochemical, chemical and chemical industry, 8.food, beverages and tobacco industry, 9.communications equipment, computers and other electronic equipment manufacturing industry, 10.general equipment manufacturing industry, 11.sporting goods manufacturing industry, 12.medicine manufacturing industry, 13.instrumentation and culture, office machinery manufac-turing industry and 14.special equipment manufacturing industry) are control variables, LSD method (Do not violate the assumption of homogeneity of variance) and Tamhane method(Violate the assumption of homogeneity of variance) are applied to analyzing for acquiring more sample group with comparison of significant characteristic such as table.7.(Label">" expains "Significantly better than".)

Based on analytical results of table.7, control variables such as scale of business, organization form, administrative area and industry all have sample group with comparison of significant characteristic which is implied that control variables have significant affection on dynamic capabilities and enterprise growth performance. Based on analytical

results of different sample group which are acquired through LSD method (Do not violate the assumption of homogeneity of variance) and Tamhane method (Violate the assumption of homogeneity of variance) test, difference of decomposing contents of dynamic capabilities and enterprise growth performance among sample group can be observed directly for finding out valuable academic rules and explaining theory analytical framework (Theoretical Analysis Model such as Fig.1) under the analytical condition of different control variables.

4.3.   SEM Test and Analysis

(1) Construction of initial model. Based on Theoretical Analysis Model (Fig.2) and analytical results from chapter 4.2, initial model is established such as table.8. Twenty three initial paths have been tested through SEM model, parameter χ2 equals to 1161.734, degrees of freedom equals to 567, CMIN/DFequals to 2.049(greater than the standard value of 2.000), RMSEA equals to 0.165(greater than the standard value of 0.08), TLI equals to 0.788 and CFI equals to 0.823 which are less than the standard value of 0.900. The parameters C.R. of sixteen initial paths in SEM model(such as Organizational modula-rity→Sensing capabilities, Organizational modularity →non-financial performance, Intellectual Capital → Grasping capabilities, Intellectual Capital→ non-financial performance, Intellectual Capital→ financial performance, Knowledge resource → Grasping capabilities, Knowledge resource→ Restructuring capabilities, Knowledge resource→ non-financial performance, Knowledge resource→ financial performance, Sensing capabilities→ financial performance, capabilities→ non-financial performance, Grasping capabilities →financial performance, Grasping capabilities→ non-financial performance and Restructuring capabilities→ financial performance) are less than standard value of 1.96, parameters P can't match the significance level, the initial SEM model can't match survey requirement.

Table.7. Variance analytical abstract list of comparative difference between dynamic capability and enterprise growth performance based on different controlled variable

7-1 Variance analytical abstract list of comparative difference based on scale of business(n.s.p >.05 *p <.05 ***p <.001)						
Concept	Layer	SS	MS	F Test	LSD Method	Tamhane Method
Dynamic Capabilities	Sensing capabilities	393.968	196.984	*4.870	1 > 3	
		7766.166	40.449			
	Grasping capabilities	441.244	220.622	*5.801	1 > 3, 2 > 3	
		7302.428	38.033			
	Restructuring capabilities	281.001	140.501	*4.568	1 > 3, 2 > 3	
		5905.614	30.758			
Enterprise Growth Performance	Financial performance	842.958	421.479	***8.007	1 > 2, 1 > 3	
		10107.175	52.642			
	Market demand	155.641	77.820	*4.248	1 > 3, 2 > 3	
		3517.046	18.318			
	Inner process	300.417	150.208	*4.501	1 > 3	
		6407.768	33.374			

7-2 Variance analytical abstract list of comparative difference based on organization form(n.s.p >.05 *p <.05 ***p <.001)							
Dynamic Capabilities	Sensing capabilities	640.329	160.082	*4.045			4 > 5
		7519.805	39.578				
	Grasping capabilities	500.719	125.18	*3.284			4 > 5
		7242.953	38.121				
	Restructuring capabilities	540.342	135.086	*4.546	4 > 3, 4 > 5		
		5646.273	29.717				
Enterprise Growth Performance	Financial performance	796.4	199.1	*3.726	1 > 5, 2 > 5, 4 > 5		
		10154	53.441				
	Staff growth and learning	222.05	55.512	*2.505	4 > 3, 4 > 5		
		4210.6	22.161				
	Market demand	269.56	67.39	*3.762	4 > 2, 4 > 5		
		3403.1	17.911				
	Inner process	480.512	120.128	*3.665			4 > 5
		6227.67	32.777				
7-3 Variance analytical abstract list of comparative difference based on administrative area(n.s.p >.05 *p <.05 ***p <.001)							
Dynamic Capabilities	Sensing capabilities	807.507	134.585	*3.441			3 > 1
		7352.626	39.11				
	Grasping capabilities	641.612	106.935	*2.831	3 > 1, 4 > 1, 3 > 7 4 > 7, 6 > 7		
		7102.06	37.777				
	Restructuring capabilities	710.545	118.424	*4.066			3 > 1, 6 > 1
		5476.07	29.128				
Enterprise Growth Performance	Financial performance	1213.617	202.270	*3.906	3 > 1, 3 > 2, 3 > 7 4 > 1, 4 > 7, 6 > 7		
		9736.516	51.790				
	Staff growth and learning	550.99	91.831	***4.448			3 > 1, 4 > 1, 6 > 1
		3881.6	20.647				
	Market demand	379.53	63.254	*3.611			3 > 1, 6 > 1
		3293.2	17.517				
	Inner process	654.33	109.055	*3.387			3 > 1, 6 > 1
		6053.9	32.201				

Following table.7. Variance analytical abstract list of comparative difference between dynamic capability and enterprise growth performance based on different controlled variable

7-4 Variance analytical abstract list of comparative difference based on industry(n.s.p >.05 *p <.05 ***p <.001)						
Dynamic Capabilities	Sensing capabilities	9064.337	697.257	2.517*	1 > 4,9 > 1,10 > 1,13 >2, 12 > 4, 13 > 4,14 >2, 14 >3, 5 >3	
		50132.709	276.976			
	Grasping capabilities	7672.637	602.115	2.134*	1 > 4,9 > 1,10 > 1,10 > 2,12 > 4, 14 > 2,14 >3, 14 >4, 5 >3	
		42107.03	207.334			
	Restructuring capabilities	7912.513	638.372	2.297*	1 > 2, 9 > 1,10 > 1,10 > 2,12 >3, 14 > 2,14 >3, 5 >3, 5 >4	
		45216.01	229.4378			
Enterprise Growth Performance	Financial performance	5523.6	427.4	3.519*		1 > 3, 9 > 4,5 > 1,10 > 2,12>3, 12 > 4, 14 > 2, 14 >3, 14 >13
		34225.6	193.334			
	Staff growth and learning	4832.06	379.427	3.105*		1 > 2, 1 > 3, 9 > 3,5 > 2, 5 > 3, 10> 3,10> 4,14 > 2, 14 >3 >13
		31210.4	162.249			
	Market demand	4269.56	347.27	2.762*		1 > 3,1 > 4, 5 > 2,10 > 3,12>3, 12 > 4, 14 > 2, 14 >3, 14 >13
		30114.3	145.933			
	Inner process	4495.524	352.247	3.025*		1 > 3, 5 > 3, 5 > 4 10 > 3, 10> 4, 12 > 7, 12 >13,14 >3,14 >13
		33119.78	152.659			

Table.8. Fitted information of the initial SEM model

Path			Path coefficents	Standardized estimates	S.E.	C.R.	P
Sensing capabilities	<---	Intellectual Capital	0.794	0.143	0.069	2.055	0.04
Sensing capabilities	<---	Knowledge resource	0.633	0.232	0.068	3.387	***
Sensing capabilities	<---	Organizational modularity	-0.464	-0.126	0.08	-1.569	0.117
Grasping capabilities	<---	Organizational modularity	0.489	0.155	0.415	0.373	0.709
Grasping capabilities	<---	Sensing capabilities	1.003	1.168	2.715	0.43	0.667
Grasping capabilities	<---	Intellectual Capital	-0.199	-0.042	0.441	-0.094	0.925
Grasping capabilities	<---	Knowledge resource	-0.278	-0.118	0.622	-0.19	0.849
Restructuring capabilities	<---	Grasping capabilities	1.039	1.028	0.277	3.717	***
Restructuring capabilities	<---	Intellectual Capital	-0.061	-0.013	0.058	-0.219	0.827

Restructuring capabilities	<---	Organizational modularity	0.165	0.052	0.038	1.358	0.175
Restructuring capabilities	<---	Knowledge resource	-0.144	-0.061	0.053	-1.137	0.255
non-financial performance	<---	Restructuring capabilities	2.511	11.761	16.535	0.711	0.477
non-financial performance	<---	Sensing capabilities	0.611	3.3	6.045	0.546	0.585
non-financial performance	<---	Grasping capabilities	-2.095	-9.711	20.891	-0.465	0.642
financial performance	<---	non-financial performance	1.326	0.282	0.393	0.718	0.473
financial performance	<---	Sensing capabilities	0.048	0.055	0.824	0.067	0.946
financial performance	<---	Grasping capabilities	-0.625	-0.616	1.965	-0.314	0.754
financial performance	<---	Restructuring capabilities	0.159	0.158	2.843	0.056	0.956
Note: CMIN = 1161.734, DF = 567, CMIN/DF = 2.049, RMSEA = 0.165, TLI = 0.788, CFI = 0.823							
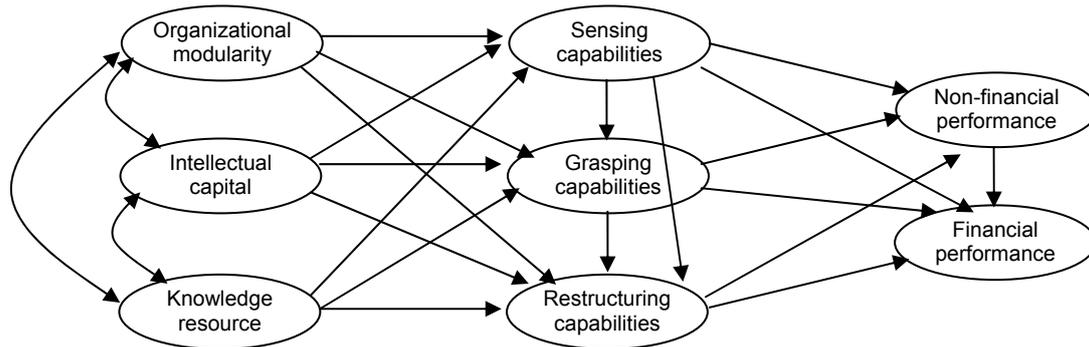
Fig.2. Construction of Initial SEM Model

(2) Modification and Fitting of SEM model. Based on fitted results and academic research papers about relation of variables, the initial SEM model is adjusted and modified. According to modifying index and critical ratio, the initial SEM model can be expanded; part of limited paths can be released or deleted. Modified analysis results can be acquired such as table.9 and fig.3, the principal parameters in modified SEM model match fitted the standard, fitted results are favorable, seven paths of variables match the significance level such as Knowledge resource→ Sensing capabilities, Intellectual Capital →Sensing capabilities, Organizational modularity →Grasping capabilities, Sensing capabilities →Grasping capabilities, Grasping capabilities→ Restructuring capabilities, Restructuring capabilities→non-financial performance and non-financial performance→financial performance. The above-mentioned paths are essential for further analysis of large and medium manufacturing enterprises.

Table.9. Fitted information of modified SEM model

Path			Path coeffcients	Standardized estimates	S.E.	C.R.	P
Sensing capabilities	<---	Intellectual Capital	0.049	0.274	0.025	1.98	0.048
Sensing capabilities	<---	Knowledge resource	0.262	0.709	0.056	4.666	***
Grasping capabilities	<---	Organizational modularity	0.121	0.384	0.028	4.279	***
Grasping capabilities	<---	Sensing capabilities	0.713	0.621	0.109	6.568	***
Restructuring capabilities	<---	Grasping capabilities	0.723	0.728	0.139	5.214	***
Restructuring capabilities	<---	Intellectual Capital	0.056	0.272	0.027	2.069	0.038
non-financial performance	<---	Restructuring capabilities	4.684	0.999	0.285	16.452	***
financial performance	<---	non-financial performance	0.194	0.91	0.014	13.708	***
Note: CMIN = 1176.638, DF = 577, CMIN/DF = 2.039, RMSEA = 0.074, TLI = 0.905, CFI = 0.913							
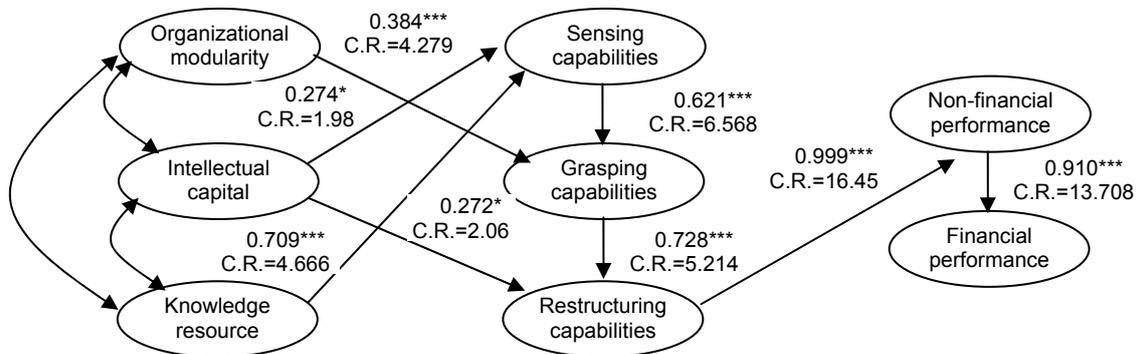
Note: *, significance level p<0.05; ***, significance level p<0.01;

Fig.3. Standardized Estimates of Modified SEM Model Path

5. The Conclusion and Shortage of the Study
5.1. Conclusion

The explanation of enterprise growth performance and competitive advantage based on Resource-Based View (RBV) or theory of core capability，is "dynamic" capabilities derived by "static" capabilities to explain the academic focus (Teece,1997,2007; Zott,2003; Zhang G,2010). Empirical analytical results reveal that intellectual capital, flexible organizational modularity and knowledge resource have a direct affection on enterprise growth performance, and the intermediary role of dynamic capabilities is significant. Based on empirical research results, the following important academic rules and conclusion can be found out.

(1) The improving organization specialization, standardization, decision liberalization, interface rule normalization and system promote the dynamic capabilities (including sensing capabilities, grasping capabilities and restructuring capabilities) for enterprises to adapt to the situation. From the test of SEM model, the affection path standardized estimate of flexible organizational modularity on grasping capabilities of dynamic capabilities equals to 0.384, it is found out that flexible organizational modularity has a significantly positive affection on grasping capabilities. Comparing with research results of some scholars (Zott, 2003; Zhang G, 2010), our research find out that flexible organizational modularity has a direct affection on grasping capabilities, the mixing of flexible organizational modularity and sensing capabilities form grasping capabilities in large and medium manufacturing enterprises. It is caused by significant modularity efficiency of organizational structure of large and medium manufac-turing enterprises in China, our research results distinguish from the research of Zott(2003) and Zhang(2010) based on the main samples of medium and small sized high-tech enterprises. In conclusion, the organization with better adaptability tends to set up flexible module in complicated situation which display in the aspect of market and technology in large and medium manufacturing enterprises

(2) The special organizational knowledge store style that the staff works as vector can develop the dynamic capabilities by the accumulation of knowledge and experiences. From the test of SEM model, effection path standardized estimate of intellectual capital on sensing capabilities and restructuring capabilities of dynamic capabilities equals to 0.272 and 0.274, it is found out that intellectual capital has a significantly positive effect on sensing and restructuring capabilities. Comparing with some scholars (Edvinsson, 2003), our research find out that the mixing of intellectual capital and knowledge resource have a direct affection on sensing capabilities, the mixing of intellectual capital and grasping capabilities together form restructuring capabilities. Two significant paths are caused by obvious extensive feature of knowledge resource, speciality and centrality of knowledge resource should be found out by intellectual capital and further form sensing capabilities of large and medium manufacturing enterprises. In the meantime, grasping capabilities acquire necessary transforming resource, the further impellent function of intellectual capital restructure promoting core capabilities which is adapted to change of circumstances. Our research results distinguish from the research of Edvinsson (2003) based on the main samples of medium and small sized high-tech enterprises. In conclusion, the interaction of human capital, structure capital and relationship capital is suitable to form flexible dynamic capabilities (especially forming sensing capabilities and restructuring capabilities) in large and medium manufacturing enterprises.

(3) The essence of dynamic capabilities is the knowledge accumulation and transformation during the process of knowledge creation. Linked by organization learning, dynamic capabilities improve its ability through encoding and standardization. From the test of SEM model, effection path standardized estimate of knowledge resource on sensing capabilities of dynamic capabilities equals to 0.709, it is found out that knowledge resource has a significantly positive effect on sensing capabilities. Comparing with research results of some scholars (Teece, 2007; Cepeda, Vera, 2007), our research find out that knowledge resource can not independently and self-organizationally form any branching capability of dynamic capabilities, the mixing of knowledge resource and intellectual capital can form sensing capabilities. Medium and small sized enterprises discriminate, excavate knowledge and sense chance and risk of change of circumstances based on the core of top administrators. By contrast, intellectual capital of large and medium manufacturing enterprises show more significant extensive and organizational feature. Our research results distinguish from the research of Teece (2007), Cepeda and Vera (2007) based on the main samples of medium and small sized high-tech enterprises. In conclusion, the acquisition, selection, distribution of external knowledge develops more suitable dynamic capabilities (especially forming sensing capabilities) in complicated situation which display in the aspect of market and technology in large and medium manufacturing enterprises.

(4) Cognition is considered as the basis of knowledge resource, and intellectual capital is subjective initiative manmade driving factor. The three academic concepts such as knowledge resource, intellectual capital and flexible organizational modularity intergrate, and transform the dominant as well as recessive knowledge into coded knowledge under the interaction. This is the key part to cultivate dynamic capabilities. Comparing with research results of some scholars (Zott, 2003; Zhang G, 2010; Edvinsson, 2003; Teece, 2007; Cepeda, Vera, 2007), our research find out that dynamic capabilities has obvious compositeness and progressive feature, the mixing of intellectual capital and knowledge resource form sensing capabilities, the mixing of flexible organizational modularity and sensing capabilities form grasping capabilities, the mixing of intellectual capital and grasping capabilities form restructuring capabilities. The sensing capabilities, grasping capabilities and restructuring capabilities has obvious sequential path. It is due to the intensive function of precise industry process of large and medium manufacturing enterprises. In conclusion, our research results distinguish from the research of above-mentioned scholars based on the main samples of medium and small sized high-tech enterprises. Dynamic capabilities (including sensing capabilities, grasping capabilities and restructuring capabilities) promotes the company to keep high sentitivity on marketing information collection and opportunity grasp, so it can obtain supporting resources to reintegrate, reconfigure and recreate higher ability, and still further, enterprise can consolidate durative competitive advantage and harvest extra enterprise growth performance in large and medium manufacturing enterprises.

(5) Flexible organization structure, the active intellectual capital and characteristic knowledge resource will affect the struggle for competitive advantage and extra performance. From the test of SEM model, flexible organizational modularity, intellectual capital and knowledge resource has not a direct effect but rather an indirect effect on enterprise growth performance through the intermediary role of dynamic capabilities with effection path such as organizational modularity→grasping capabilities→ restructuring cap-abilities→non-financial performance → financial perfor-mance, intellectual capital and knowledge resource

→sensing capabilities→ grasping capabilities→ restructuring capabilities →non-financial performance →financial performance, intellectual capital→restructuring capabilities →non-financial performance → financial performance. Analytical framework as Knowledge Resource→Dynamic Capabilities→Enterprise Growth Performance has been proved to be persuasive on the intermediary role of dynamic capabilities through SEM test. Comparing with research results of some scholars (Eisenhardt, 2003; Delmaretal, 2003; Chandler,Hanks,1994; Zhang G,2010), our research find out that flexible organizational modularity, intellectual capital and knowledge resource have not a direct affection on enterprise growth performance (financial performance and non-financial performance), above-mentioned three concepts firstly form dynamic capabilities (sensing, grasping and restructuring capabilities) and further affect on growth performance. In the meantime, the sensing and grasping capabilities have not a direct affection on enterprise growth performance but form restructuring capabilities firstly, and affect on non-financial performance afterwards, and affect on financial performance finally. Non-financial performance produces financial performance, financial performance is final result but not the feature of core-competence caused by dynamic capabilities. Comparing with research results based on the main samples of medium and small sized high-tech enterprises of some scholars (Eisenhardt, 2003; Delmaretal, 2003; Chandler,Hanks,1994; Zhang G,2010), the formal feature of organizational structure and precise feature of industry process bring out difference in large and medium manufacturing enterprises, it is a very important explanation for the administrative phenomena.

5.2. Principal Revelation

(1) Firstly, enterprise should set up growth route map from strategic view. It is essential component of enterprise competitive strategy to constructing flexible organization structure, forming subjective initiative intellectual capital and creating particular knowledge resource that can not be easily copied and learned especially in large and medium manufacturing enterprises. Furthermore, on account of dynamic external environment and hysteresis effect of competitive strategy, enterprise should keep high sensitivity for environmental change and rapid integration of resources to grasp business opportunity. Following by cycle-time reduction of industrial technological updating and personalized developmental trend of market demand which is mutable and diversified, adaptability to environment will prove to be essential keylink of competition advantage, large and medium manufacturing enterprises should get ready for strategy and operation.

(2) Secondly, the empirical research result reveals the intermediary role of dynamic capabilities which explain the function of transmission and transformation between flexible organizational modularity, intellectual capital, knowledge resource and enterprise growth performance in large and medium manufacturing enterprises. It provides analytical focus of administrative issues for setting up and carrying out of competitive stratege. For instance, through monitoring capabilities of acquiring, grasping and restructuring internal and external experience, knowledge and skill, administrator can find out problems of knowledge resource management, structural relation of internal organization, intellectual capital fostering and organization learning. Base on above-mentioned analytical view, corresponding administrative method can be devised and carried out. Enterprise growth performance can be forecasted and explained by change of dynamic capabilities especially in large and medium manufacturing enterprises.

(3) Finally, empirical research reveals positive effect of flexible organizational modularity, intellectual capital and knowledge resource towards dynamic capabilities (including sensing capabilities, grasping capabilities and restructuring capabilities) in large and medium manufacturing enterprises. Sufficient comprehension of the above-mentioned four academic concept's interactive relation contributes to set up and carry out competitive strategy to allocate and integrate resources such as human, capital, information, equipment and knowledge. It is really essential to strengthen dynamic capabilities for promoting enterprise growth performance. If ignoring this empirical research conclusion, administrator may make attention to short-term financial performance and blemish sustainable development of enterprise growth so that enterprise is short of further developing prospect. Enterprise administrator should attach importance to foster dynamic capabilities and effection mechanism which display the function of transmission and transformation between organizational modularity, intellectual capital, knowledge resource and enterprise growth performance during the period of strategy setting up and carrying out especially in large and medium manufacturing enterprises.

5.3. Shortage of the Study

(1) Firstly, the analysis in this article only uses section data which limits the empirical tests for variables causality. Furthermore, one hundred and ninety-five analytical samples (large and medium manufacturing enterprises in China) only match basic requirements of statistical test based on SEM model. Further study will apply longitudinal data to explore their causality on the basis of a larger scale sample (enterprises in manufacturing, high-tech enterprises or other industry) to strengthen universality and reliability of research conclusion.

(2) Secondly, empirical research is carried out with large and medium manufacturing enterprises of maturity stage, it significantly differs from small and medium sized enterprises with different developmental stage, responsing capability to market, initial resource and technical level. Futher study will test small and medium sized firms for varied scale may result differently. Comparing with different conclusion based on different samples, further academic rules and interesting administrative phenomena will be found out especially in traditional manufacturing industry and high-tech industry.

(3) Finally, the linear relationship among five academic concepts in this article(organizational modularity, intellectual capital, knowledge resource, dynamic capabilities and enterprise growth performance) is researched in this paper for the reaquirement and research limitation while further study will concerntrate on the nonlinear relationship among them to deeply explain effection mechanism of competitive strategy on operational administrative process and manufacturing enterprises growth performance, the suitable explanation can be provided through nonlinear relationship analyzing and testing.

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