

IEI Model Research on Entrepreneurial Intentions of Chinese College Students

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Abstract—Based on research on factors influencing entrepreneurial intentions of Chinese college students, IEI model is established by dividing the existing relevant factors into intrinsic and extrinsic factors. By analyzing 2,114 effective questionnaires, a structural equation model method is applied to verify three intrinsic factors influencing the entrepreneurial intentions of Chinese college students as the cognitions of individual entrepreneurship elements, entrepreneurial environment in colleges and universities and social entrepreneurship ecosystem. In the meantime, the extent of influence on entrepreneurial intentions from extrinsic factors including individual background is verified by means of one-factor analysis of variance. The research shows that IEI Model is in line with research on entrepreneurial intentions of Chinese college students.

Keywords—entrepreneurial intentions; individual background; IEI model; college students

I. INTRODUCTION

Since the concept of entrepreneurial intentions[1] proposed by Bird, entrepreneurial intention is becoming a new focus of entrepreneurship research in the world. At present, Chinese research is mainly focused on concept, measurement, theoretical model and influencing factors of entrepreneurial intentions, dimension structure and influence factor demonstration and status survey of entrepreneurial intention[2]. Judging from existing research, it is short of large-scale investigations and introspection, and based on deep analysis of factors influencing entrepreneurial intentions of college students, IEI model (entrepreneurial intentions--extrinsic factors--intrinsic factors) is set up by drawing lessons from and following effective practices of classical research model.

II. ESTABLISHMENT AND IMPLEMENTATION OF IEI MODEL

A. Establishment of IEI Model

As the best predictor for entrepreneurial behaviors, entrepreneurial intention is the central point to understand entrepreneurial behaviors[3], which is always considered as the

focus and breakthrough for entrepreneurship research. Entrepreneurial intention is a kind of value judgment for individuals to choose entrepreneurship process or activities or not, which belongs to individual intrinsic factors. Development of anything is the consequence of interactions between intrinsic and extrinsic factors, and extrinsic factors are conditions of change and intrinsic factors are the basis for change, by which the extrinsic factors act[4]. Based on the existing studies, factors influencing entrepreneurial intentions of college students mainly relate to individual traits (including personal traits and behavior control), entrepreneurial attitude (actually entrepreneurial motivation), success factors (including belief), environment (including resources and knowledge), individual background, etc. Formation of entrepreneurial intentions of college students, taken together, is not determined by economic environment of socialism market and is not the inevitable result of popularization of higher education in China, which is produced together by extrinsic factors mainly including individual background of college students and intrinsic factors mainly referring to cognition conditions.

This research assimilates and draws lessons from successful practices of ISO Model[5], and factors influencing entrepreneurial intentions of college students are divided into two dimensions as intrinsic and extrinsic factors. Intrinsic factors refer to cognition of individual entrepreneurship factors, individual cognitions of social entrepreneurial ecosystem and of entrepreneurship environment in colleges and universities. Furthermore, extrinsic factors mean individual gender, growth environment, family financial status, parents' occupations, major and educational background at the college or university where he/she studies. The entrepreneurial intentions of college students are influenced by interactions between intrinsic factors mainly including cognition conditions and extrinsic factors mainly referring to individual background. On this basis, IEI (entrepreneurial intentions--extrinsic factors--intrinsic factors) model of factors influencing entrepreneurial intentions of college students is set up. The model is a simple model highly generalized, which only considers the influence on entrepreneurial intentions of college students from intrinsic factors mainly including cognition conditions and extrinsic

factors mainly referring to individual background. The intrinsic factors defined in this research means the cognition condition of individuals in entrepreneurship. The cognition condition can be directly developed into expression of entrepreneurial motivation. There is causal connection between entrepreneurial motivation and behaviors and the motivation leads to entrepreneurial behaviors or process.

B. Implementation of IEI Model

Investigation is made by this research in eastern, western and middle China, with 2,114 effective questionnaires collected. As entrepreneurship intention is used as a central random variate and Likert scale is adopted for observational measurement, entrepreneurial intention is divided into entrepreneurial consciousness intention and college entrepreneurship intention based on previous research. The entrepreneurial consciousness intention is reflected in entrepreneurial intention of college students and other factors; and college entrepreneurship intention is reflected in whether college students seriously consider entrepreneurship.

With respect to intrinsic factors of entrepreneurship intention of college students, effective practices of previous research are compared in detail in this research, and Likert scale is adopted for observational measurement. The entrepreneurial motivation mainly includes such four observed items as economic pursuit, self-achievement pursuit, social status pursuit and responsibility pursuit; cognition of individual entrepreneurship factors mainly consists of two observed items including cognition of basic entrepreneurial elements and entrepreneurial technology and intelligence accumulation; cognition of college entrepreneurship environment mainly include such two observed items as college external support and college entrepreneurial atmosphere; and cognition of social entrepreneurship ecosystem mainly consists of such six observed items as economic situation, market environment and support from family, friends and government policies, and social environment.

In respect of extrinsic factors of entrepreneurial intention, six observed items are adopted, including gender, place of growth (city or village), family financial status, conditions of brothers and sisters, parents' occupation, grade and major of college or university.

III. VERIFICATION OF IEI MODEL

Intrinsic and extrinsic factors of entrepreneurial intentions of college students are measured qualitatively and nominally. Firstly, verification of structural equation model is carried out for intrinsic factors and analysis of variance is made for extrinsic factors.

A. Structural equation model verification of intrinsic factors

1) Analysis on reliability and validity of research samples

For reliability of structural equation model verification, analysis on reliability and validity of research sample data is made in this research. The analysis shows that overall Cronbach's α value of questionnaires is 0.901, and it is evident that reliability and stability of measured data is relatively high and it is in line with basic requirements of verification.

Furthermore, Cronbach's α values of cognition of entrepreneurship intentions, motivation and individual entrepreneurship factors and cognitions of college entrepreneurship environment and social entrepreneurship ecosystem is within an acceptable range(see Table I). In the meantime, the validity value of KMO of research samples is 0.823, very close to the reference ratio of 1, according to KMO of all observed variates and Bartlett's ball verification and it shows a relatively high partial correlation between variates (with better effect in the actual analysis in the case of KMO value above 0.7) and better effect of factor analysis. It shows very high validity and reliability of relevant variates and level of significance P is less than 0.01, which further indicates relatively high internal reliability and that it is suitable for factor analysis.

TABLE I. VALIDITY AND RELIABILITY VERIFICATION OF IEI MODEL

Measurement scale	Cronbach's α Value	KMO value	Bartlett's value
Entrepreneurial	0.921	0.803	0.752
Entrepreneurial motivation	0.837	0.835	0.776
Cognition of individual entrepreneurship factors	0.883	0.841	0.783
Cognition of college entrepreneurship environment	0.906	0.808	0.817
Cognition of social entrepreneurship ecosystem	0.912	0.812	0.831

2) Structural equation model verification of research samples

AMOS20.0 modeling tools are used for verifying theoretical models to output a Model M1.

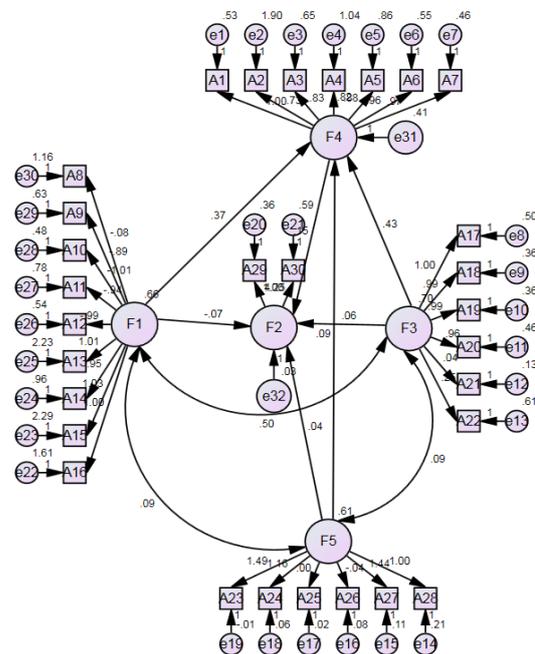


Fig. 1. Model M1 of IEI model intrinsic factors

Judging from the Model M1, Level I observed items include cognition of individual entrepreneurship factors (F1),

cognition of college entrepreneurship environment (F3), cognition of social entrepreneurship ecosystem (F5), entrepreneurial intentions (F2) and entrepreneurial motivation (F4); Level II observed items consist of economic pursuit (A1-A2), self-achievement pursuit (A3-A4), social status pursuit (A5-A6), responsibility pursuit (A7), cognition of basic entrepreneurial elements (A8-A12), entrepreneurial technology and intelligence accumulation (A13-A16), college external support (A17-A21), college entrepreneurial atmosphere creation (A22), economic situation (A23), market environment (A24), family support (A25), family support (A26), government policy support (A27), social support (A28), entrepreneurial consciousness intention (A29) and college entrepreneurship intention (A30).

Set by this model, 81 parameters to be evaluated, with freedom degree of 395, which satisfies essential conditions for model recognition and enables parameter evaluation of model to be carried out. According to significance test results of path coefficients, P values corresponding to all parameters to be evaluated are less than 0.01, in other words, it shows notable difference between confidence coefficients of 95% and 0 for path coefficients. Furthermore, fitting indexes of Model M1 are estimated in this research (shown as Table II) for the purpose of consideration to reasonableness of Model M1 of IEI model intrinsic factors for data collection and it is found that model fitting indexes have a certain difference compared to the reference value and model adjustment is required according to knowledge of relevant fields and model adjustment indexes.

TABLE II. M1 INTRINSIC FACTOR STRUCTURAL EQUATION FITTING INDEX

CMIN/DF (x2/df)	GFI	AGFI	NFI	TLI	CFI	RMSEA
The smaller the better	>0.9	>0.9	>0.9	>0.9	>0.9	<0.05
10.97	0.87	0.847	0.0878	0.877	0.888	0.069

Based on analysis of AMOS20.0, correlations among variates are found, increased and established to adjust model 1 on the premise that it satisfies relevant reasonable explanations. Finally adjusted model M2 is available after model re-estimation and adjustment for many times, shown as Fig.5. By analysis of modified indexes, e26 and e28 have maximum MI value of 419.840, which shows that chi-square value of model will decrease a lot if paths relevant to residual errors between A12 and A10 increase. Based on the real situation, there is inevitable connection between selections for entrepreneurial risk resistance of college students (A12) and business model (A10). A good business model is propitious to assistance in successful risk assistance for college students, and on the contrary, it is the opposite. E24 and e25 have the MI value of 388.189, which indicates the relation between specialty (A14) and fighting spirit (A13) of college students. E2 and e4 have the MI value of 325.696, which means the correlation between entrepreneurship of college students being annexed to more wealth (A2) and entrepreneurship being an opportunity to challenge yourself (A14). Based on these analyses, adding paths of correlations between e26 and e28, e24 and e25, e2 and e4 is considered. Model evaluation is rerun to get MI value of transition model. The results indicate larger MI values between A11 and A9, A28 and A23, A28 and A24, A19 and A20, A17 and A18, A6 and A7, A3 and A4, A1 and A5 and existence of certain correlation; and therefore, eight paths of correlations

between e27 and e29, e14 and e19, e14 and e18, e10 and e11, e8 and e9, e6 and e7, e3 and e4, e1 and e5 are added.

TABLE III. MODIFICATION INDEX OF TRANSITION MODEL

factor	factor	M.I.	Par Change	
e27(A11)	↔	e29(A9)	105.780	0.169
e14(A28)	↔	e19(A23)	145.923	-0.022
e14(A28)	↔	e18(A24)	240.990	0.035
e10(A19)	↔	e11(A20)	130.509	0.122
e8(A17)	↔	e9(A18)	109.628	0.115
e6(A6)	↔	e7(A7)	114.260	0.134
e3(A3)	↔	e4(A4)	151.243	0.222
e1(A1)	↔	e5(A5)	100.703	0.165

Constrained by length, only the overall fitting degree of modified model M2 is evaluated in this article, shown as Table 4, with detailed evaluation of transition model omitted.

TABLE IV. M2INTRINSIC FACTOR STRUCTURAL EQUATION FITTING INDEX

CMIN/DF (x2/df)	GFI	AGFI	NFI	TLI	CFI	RMSEA
The smaller the better	>0.9	>0.9	>0.9	>0.9	>0.9	<0.05
5.169	0.937	0.924	0.0878	0.944	0.954	0.044

Table II and Table IV can indicate that chi-square value/freedom degree of modified M2 reduces greatly, and various fitting indexes are greatly improved and all parameters (CMIN/DF or x2/df, GFI, AGFI, NFI, TLI, CFI, RMSEA) are within the acceptable evaluation interval; with comprehensive improvement of model fitting, all parameters below 0.01 are significant, and coefficients of measurement corresponding to equations are amplified.

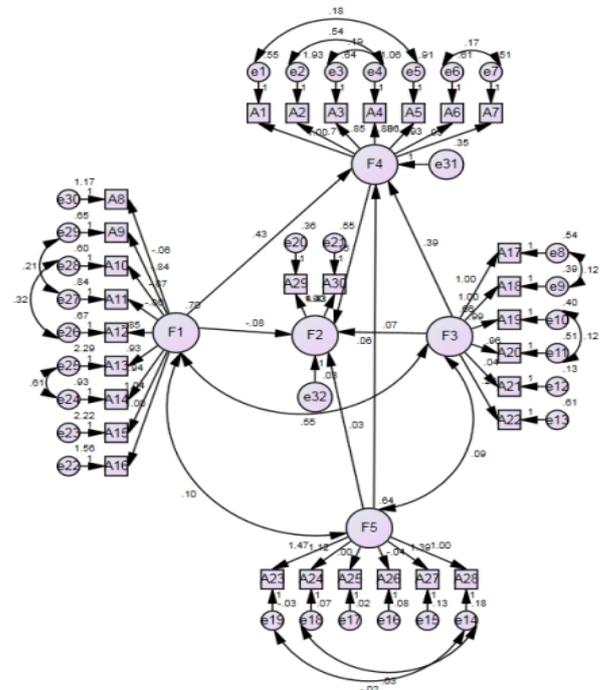


Fig. 2. Better model M2 of IEI model intrinsic factors

Furthermore, judging from path coefficients of IEI model M2, cognition of individual entrepreneurship factors (F1), cognition of entrepreneurship environment in colleges and universities (F3) and cognition of social entrepreneurial ecosystem (F5) have THE standardized path coefficients of 0.428, 0.393 and 0.062 respectively for entrepreneurial motivation (F4), and have the standardized path coefficients of -0.080, 0.071 and 0.033 for entrepreneurial intentions (F2); entrepreneurial motivation has the standardized path coefficient of 0.151 for entrepreneurial intentions (F2), and P values corresponding to all paths are less than 0.01, in other words, it shows notable difference between confidence coefficients of 95% and 0.

The results indicate that latent variables for individual entrepreneurship factors (F1), cognition of entrepreneurship environment in colleges and universities (F3), cognition of social entrepreneurial ecosystem (F5) and entrepreneurial motivation (F4) have gross effects of -0.015, 0.769, 0.042 and 0.151 respectively for entrepreneurial intentions (F2).

It can be found that latent variable for individual entrepreneurship factors (F1) has negative gross effect for entrepreneurial intentions (F2), which provides a new space of explanation for the research that whether more sufficient cognition of individual entrepreneurship factors it is, the lower entrepreneurial intentions are. In fact, cognition of individual entrepreneurship factors is significantly related to entrepreneurial intentions, but it is a negative relationship. It indicates that cognition of individual entrepreneurship factors reacts against entrepreneurial intentions of college students. In brief, cognition of such nine latent variables as entrepreneurship confidence (A8), product service (A9), business pattern (A10), fighting spirit (A13), specialty (A14), innovation awareness (A15) and information processing capacity (A16) have an impact on entrepreneurial intentions of college students. It is worth noting that the latent variable for cognition of entrepreneurship environment in colleges and universities (F3) in which entrepreneurial courses (A17), entrepreneurial competition (A18), enterprise tour (A19), entrepreneurial talk (A20), entrepreneurial base (A21) and entrepreneurial atmosphere (A22) are adopted as observed items has the strongest gross effect for entrepreneurial intentions (F2), which indicates that such two factors as college external support and college entrepreneurial atmosphere creation are in favor of strengthening entrepreneurial intentions of college students to improve level of entrepreneurial intentions. Moreover, the latent variable of cognition of social entrepreneurial ecosystem (F5) has low total effect value for entrepreneurial intentions (F2), in other words, six latent variables including economic situation (A23), market environment (A24), family support (A25), family support (A26), government policy support (A27), social support (A28) have an impact not obvious enough on entrepreneurial intentions of college students and even this action or relation is considered to be weaker. The research further indicates that standardized load factor of latent variable of entrepreneurial motivation (F4) against latent variable of entrepreneurial intentions (F2) is 0.151. Therefore, entrepreneurial motivation is deduced to have an impact not obvious on entrepreneurial intentions, which has certain differences from the estimation of

stronger entrepreneurial motivation, more obvious entrepreneurial intentions. In general, intrinsic factors influencing entrepreneurial intentions are made up of cognition of individual entrepreneurship factors, cognition of entrepreneurship environment in colleges and universities, direct effect on entrepreneurial intentions and indirect effect on entrepreneurial intentions by entrepreneurial motivation.

B. Variance analysis and test of extrinsic factors

In the IEI model, nominal measurement is used for extrinsic factors and a single-factor variance analysis method is adopted for the impact on entrepreneurial intentions to verify significance under different conditions. The analysis shows that such 7 factors as gender, place of growth, family financial status, one-child or not, parents' occupations, grade and major of college or university have influence on entrepreneurial intentions of college students. There is a big discrepancy between some conclusions and previous research, which is the value of this research.

- Gender has obvious impact on entrepreneurial intentions of college students. The analysis shows that the average value for male college students is higher than that of female college students by 0.2 score in respect of entrepreneurial intentions, which means male entrepreneurial intentions are higher. This conclusion keeps in line with previous research.
- Entrepreneurial intentions of college students are affected by place of growth. The previous research indicates that college students from rural areas have stronger entrepreneurial intentions than those from cities and towns. The analysis also shows this conclusion is challenged, in other words, college students from cities and towns have stronger entrepreneurial intentions than those from rural areas. It makes sense that entrepreneurship in the past is for survival, belonging to necessity entrepreneurship, which means it aims at meeting the requirement of individual survival; and nowadays, with the development of economic society, necessity entrepreneurship is replaced by opportunity entrepreneurship, in other words, entrepreneurship aims at fulfilling individual value demand. It is evident that college students from cities and towns generally have better conditions than those from rural areas, and entrepreneurial intentions reverses at present.
- Entrepreneurial intentions of college students are affected by family financial situation. The analysis shows that college students from wealthy family have the highest entrepreneurial intentions, followed by poor students, and then by college students from well-off families and college students from the ordinary family have the lowest intentions. It indicates that family financial conditions have polarized impacts on entrepreneurial intentions of students, in other words, college students from wealthy and poor families have higher entrepreneurial intentions than those from other families.

- One child situation has obvious impact on entrepreneurial intentions of college students. The analysis indicates that the entrepreneurial intentions of college students from one-child families are obviously higher. It shows that the intentions are affected by the family having brothers and sisters or not.
- Parents' occupations have obvious impact on entrepreneurial intentions of college students. The analysis shows that entrepreneurial intentions of college students whose parents are commercial personnel and businessmen rank top 2, and college students whose parents are personnel of administrative organs and government-sponsored institutions have the lowest intentions of entrepreneurship. It shows that the intentions are affected by family environment.
- Grade has obvious impact on entrepreneurial intentions of college students. In respect of levels, college students with graduate degree have the highest intentions of entrepreneurship, followed by those with college degree, and undergraduates have the lowest entrepreneurial intentions; and judging from college or university situation, college students from graduating class have obviously higher intentions of entrepreneurship than non-graduating class while college students in senior grade have higher intentions than those in junior grade. It shows that the intentions are affected by educational background and acquirements.
- Major and discipline have obvious impact on entrepreneurial intentions of college students. The analysis shows the highest entrepreneurial intentions of college students in majors of economics and management science, with those in engineering, education, literature and history ranking the last four positions. It shows that the intentions are affected by major and discipline background.

IV. CONCLUSIONS

This research brings forward the IEI model of factors influencing entrepreneurial intentions of college students and poses unified regulations for variables of the influencing factors. The research indicates that three variables of intrinsic factors mainly including cognition conditions (cognitions of individual entrepreneurship factors, entrepreneurship environment in colleges or universities and social entrepreneurial ecosystem) have different impacts on entrepreneurial intentions of college students, among which, cognition of entrepreneurship environment in colleges or universities have the obvious influence while cognition of social entrepreneurial ecosystem have the lowest impact and cognition of individual entrepreneurship factors show negative relation to the intentions; extrinsic factors mainly consisting of individual background have 7 variables which have significant influence on entrepreneurship of college students.

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