A Study on Innovation Performance Measurement of College Students' Venture Enterprise Based on SFA Model

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***Abstract*—The study of innovation performance helps to complete the measure of development ability of venture enterprise for college students. The study builds models of Stochastic Frontier Analysis on innovation performance of college students' venture enterprise by setting up Variable quantity and putting forward a hypothesis. This paper sampled 20 historical data about college students' venture enterprise, employed statistic software to measure and analyzes and brought forward some strategies in developing innovation performance in the process of starting new work for college students. Conclusion is reached that the innovation performance of new venture enterprises generally promotes with the development of enterprises and that the innovation performance of different professions is influenced by such factors as scale, field and economy. Media enterprises, concerned about by college students, have better innovation performances but have bigger risk, machinery industry has worse innovation performance but more stable condition, light industry is between them.**

***Index Terms*—venture enterprise, college Students, innovation performance, Stochastic Frontier Analysis**

I. INTRODUCTION

College students venture enterprises are run by undergraduates and graduates as well. Currently college students' starting a business is a hot issue among young groups and has been a deep concern among the public because of the influence of pressure for job hunting. As society and economy prosperously develop recently, college students venture enterprises are supposed to be a significant part among small and medium-sized enterprises. Technical innovation is essential for the survival and development of the small and medium-sized enterprises. Thus a further study on this project is of great significance.

Investment venture plays an important role in upgrading industrial structure, accelerating the industrialization of scientific research, and inspiring culture innovation. However, previous studies on how important a part universities and institutions play in promoting the venture industry fail to receive adequate attention. Institutions of higher education play an crucial role in the development of China's pioneering investment, which can be reflected in the following aspects: conducting researches of basic theories, spreading the knowledge of pioneering investment to society, combining the college students' contest of pioneering work with the pioneering enterprises, constructing the college garden of science and technology and institutions of pioneering investment so as to accelerate the transforming science and technology into productivity. The venture enterprise is a concrete realization of entrepreneurial spirit in a certain social-economic environment. With business awareness and capacity, the entrepreneur completes series of activities such as finding business opportunities, obtaining the necessary resource, creating and operating the new business, changing business opportunities into profits and so on. Innovation performance reflects the innovation results and it is essential for survival and growth of venture enterprises. We try to use SFA to study the innovation performance for 20 Venture enterprises of college students and provide evidence to formulate development strategies for innovative companies.

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II. LITERATURE REVIEW

Innovation performance is a necessary variable in economics and management. Published documentation has abundant achievements on studies about innovation performance evaluation. And a difference between achievements is manifested by building an index system and choosing an evaluating method.

Structuring innovation performance evaluation in published literature includes the following aspects: angle of input-output [1, 2, 3, 4, 5], angle of benefit [6, 7, 8], angle of object [9, 10], angle of network [11]. For the choice of evaluation, Zhu Yongguo (2007) employs expert suggestion way (Delphi) which confirms index's importance, and makes weighted sum [5]. Dang et al. (2004) build a complex evaluation model of technical innovation performance for enterprises on the basis of artificial neural network [11]. Wang et al. (2004) design the model of Grey Level Comprehensive Evaluation amended [8]. Yang (2007) puts forward the method of combination of regional innovation performance

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evaluation based on knowledge production function [12]. Cheng et al. from the dynamic point of view have used factor analysis and cluster analysis to make empirical analysis for 2000-2006 innovation performance of 30 provinces in China [13]. Xu et al. (2010) evaluate innovation performance of construction for 16 late-model city in China by Principal Components Analysis (PCA). In addition, some studies include two frontier function model: Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA) [14]. For example, Kuang Aimin (2010) makes a dynamic analysis on regional difference in innovation performance in China, using Data Envelopment Analysis (DEA) [15].

Recently, many experts have started the study on how innovation network influences innovation performance, for example, Zhang Wei (2009), Xie Xuemei (2010), finished building a concept model, and then used the construction equation model and examined the relationship between innovation network and enterprises innovation [16, 17]. Zhang Fanghua (2010) surveyed from 270 enterprises in Yangtze River delta region and analyzed the construction model, and then got a result. These entire enterprises innovation network promotes innovation performance clearly [18]. The studies from Dou Hongbin (2010), Wang (2010) pointed out that there is a close correlation between enterprise network and innovation performance [19, 20]. Fang Gang (2011) combined Social Network Theory and Resource-Based View, the paper tried to clarify the component of network capability and its effect on firm's innovation performance. An empirical study of the Structural Equation Modeling and multiple firms' samples indicates that network capabilities have significant positive impact on firms' innovation performance [21]. Fang Gang (2011) indicated that network capabilities have significant positive impact on firms' innovation performance which is based on Social Network Theory and Resource-Based View [22]. Fuller (2010) found that extension for enterprise knowledge network positively promotes innovative performance [23].

The study on enterprise innovation performance relies on evaluation, but is not associated with innovation enterprises closely. So that is supposed to be an important part here. This paper argues that many factors should be taken into account in the evaluation of innovation performance, and the quantitative study with the parametric methods of SFA will yield better results.

III. Model Construction

If the input and output data of I companies within T years are known and assuming that technical inefficiency term U can change over time, then the basic model for the SFA [24, 25] is:

$$\ln Y_{it} = \beta_0 + \sum_{n=1}^{N} \beta_n \ln P_{nit} + V_{it} - U_{it}$$

$$i = 1,2,\ldots I, \quad t = 1,2,\ldots,T \tag{1}$$

Take the i enterprise in the t year for example, Y_{it} is the actual output, P_{nit} is inputs of the n production factors, V_{it} is the random disturbance term, U_{it} is the technical inefficiency term, $\beta = (\beta_0, \beta_1, \cdots \beta_N)$ is the parameter vector to be estimated.

Let $U_{it} = \delta(t) \cdot U_i$, $\delta(t) = \exp\{\eta(T-t)\}$, η is the parameter to be estimated, then the model is:

$$\ln Y_{it} = \beta_0 + \sum_{n=1}^{N} \beta_n \ln P_{nit} + V_{it} - \delta(t) \cdot U_i$$

$$i = 1,2,\ldots I, \quad t = 1,2,\ldots,T \tag{2}$$

$\delta(t)$ has the following properties:

(1) $\delta(t) \geq 0$, when $t = T$, $\delta(t) = 1$.

(2) when $\eta > 0$, $\delta(t)$ is a monotone decreasing function of t, When $\eta < 0$, then $\delta(t)$ is a monotonically increasing function of t. when η=0, $\delta(t) \equiv 1$ $U_{it} = U_i$, then U and t is independent, the model degenerates into a model whose technical efficiency is not change over time.

Based on the model (2), each variable is assumed as the followings:

(1) $V_{it} \sim i.i.d\ N(0, \sigma_v^2)$,

(2) $U_{it} \sim i.i.d\ N^+(0, \sigma_\mu^2)$,

(3) V_{it} and U_{it} is independent and both are independent with the independent variables,

(4) $\delta(t) = \exp\{\eta(T-t)\}$, η is the parameter to be estimated.

Let the density function of the vector $V = (V_1, V_2, \ldots, V_T)'$ is $f(V)$, the density function of U is $g(U)$, the joint probability density function of V and U is $h(U,V)$, the density function of ε is $\mathrm{p}(\varepsilon)$.

Because

$$g(U) = \begin{cases} \dfrac{2}{\sqrt{2\pi}\sigma_\mu} \exp\{-\dfrac{\mu^2}{2\sigma_\mu^2}\} & U \geq 0 \\ 0 \quad U < 0 \end{cases},$$

$$f(V) = \frac{1}{(2\pi)^{T/2} \sigma_v^T} \exp\{-\frac{V'V}{2\sigma_v^2}\},$$

$$V = (V_1, V_2, \ldots, V_T)',$$

$$U_t = \delta_t U, \quad t = 1,2,\ldots,T$$

$$U = (\delta_1 U, \delta_2 U, \ldots, \delta_T U)' = U\delta,$$

$$\delta = (\delta_1, \delta_2, \ldots, \delta_T)' \tag{3}$$

U and V is independent, then

$$h(U,V)=\frac{2}{(2\pi)^{(T+1)/2}\sigma_\mu\sigma_v^{T}}\exp\{-\frac{1}{2}(\frac{U^2}{\sigma_\mu^{2}}+\frac{V'V}{\sigma_v^{2}})\} \quad (4)$$

for

$$\varepsilon=(V_1-\delta_1U,V_2-\delta_2U,\ldots,V_T-\delta_TU)'=V-U\delta \quad (5)$$

then

$$V=(\varepsilon_1+\delta_1U,\varepsilon_2+\delta_2U,\ldots,\varepsilon_T+\delta_TU)'=\varepsilon+U\delta \quad (6)$$

$$V'V=\sum_{t=1}^{T}(\varepsilon_t+U\delta_t)^{2}=U^2\delta'\delta+\varepsilon'\varepsilon+2U\delta'\varepsilon \quad (7)$$

$$\frac{U^2}{\sigma_\mu^{2}}+\frac{V'V}{\sigma_v^{2}}=\frac{(U-U_*)^2+\sigma_\mu^{2}\varepsilon'\varepsilon-(\frac{\sigma_\mu^{2}\delta'\varepsilon}{\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta})^2}{\sigma_*^{2}} \quad (8)$$

$$U_*=-\frac{\sigma_\mu^{2}\delta'\varepsilon}{\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta},$$

$$\sigma_*^{2}=\frac{\sigma_\mu^{2}\sigma_v^{2}}{\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta} \quad (9)$$

let

$$w=\frac{\sigma_\mu^{2}\varepsilon'\varepsilon-(\frac{\sigma_\mu^{2}\delta'\varepsilon}{\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta})^2}{\sigma_*^{2}},$$

then

$$\frac{U^2}{\sigma_\mu^{2}}+\frac{V'V}{\sigma_v^{2}}=\frac{(U-U_*^{2})}{\sigma_*^{2}}+w \quad (10)$$

$$p(U,\varepsilon)=\frac{2}{(2\pi)^{(T+1)/2}\sigma_\mu\sigma_v^{T}}\cdot\exp\{-\frac{(U-U_*^{2})}{2\sigma_*^{2}}\}\cdot\exp\{-\frac{w}{2}\} \quad (11)$$

Because

$$p(\varepsilon)=\int_0^{+\infty}p(U,\varepsilon)dU, \quad (12)$$

we making substitution and the solution is:

$$p(\varepsilon)=\exp\{-\frac{w}{2}\}\cdot\int_{-\frac{U_*}{\sigma_*}}^{+\infty}\frac{2\sigma_*}{(2\pi)^{(T+1)/2}\sigma_\mu\sigma_v^{T}}\cdot\exp\{-\frac{t^2}{2}\}dt$$

$$=\frac{2}{(2\pi)^{T/2}(\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta)^{1/2}\sigma_v^{T-1}}\cdot\Phi(\frac{U_*}{\sigma_*})\cdot\exp\{-\frac{w}{2}\} \quad (13)$$

Likelihood function is

$$L=p(\varepsilon_1,\varepsilon_2,\ldots,\varepsilon_I)$$

$$=[\frac{2}{(2\pi)^{T/2}(\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta)^{1/2}\sigma_v^{T-1}}]^{I}\prod_{i=1}^{I}[\Phi(\frac{U_{*i}}{\sigma_*})\cdot\exp\{-\frac{w_i}{2}\}] \quad (14)$$

make logarithmic on likelihood function, we have

$$\ln L=c-\frac{I}{2}\ln\sigma_*^{2}-\frac{I\cdot T}{2}\ln\sigma_v^{2}$$

$$-\frac{1}{2}\sum_{i=1}^{I}w_i-\frac{I}{2}\ln\sigma_\mu^{2}+\sum_{i=1}^{I}(\frac{U_{*i}}{\sigma_*}) \quad (15)$$

Then make the partial derivative for parameters, assume it is zero, we resolve this maximum likelihood equation and the parameter estimates $\hat{\beta}_0,\ \hat{\beta}_1,\ldots,\ \hat{\beta}_n,\hat{\eta},\hat{\sigma}_v,\hat{\sigma}_\mu$ can be obtained, and then $\hat{\varepsilon}_i(i=1,2,\ldots,I)$ can be obtained,

$$p(U\mid\varepsilon)=\frac{p(U,\varepsilon)}{p(\varepsilon)}=\frac{1}{(2\pi)^{1/2}\Phi(\frac{U_*}{\sigma_*})\sigma_*}\exp\{-\frac{(U-U_*)^2}{2\sigma_*^{2}}\} \quad (16)$$

Takes note that $p(U\mid\varepsilon)$ is truncated normal distribution; we can obtain all the numbers and expectations:

$$M(U_i\mid\varepsilon_i)=\begin{cases}U_{*i} & U_{*i}\geq 0\\ 0 & U_{*i}<0\end{cases} \quad (17)$$

$$E(U_i\mid\varepsilon_i)=U_{*i}+\sigma_*[\frac{\phi(U_{*i}\mid\sigma_*)}{\Phi(U_{*i}\mid\sigma_*)}] \quad (18)$$

and

$$U_{*i}=-\frac{\sigma_\mu^{2}\delta'\varepsilon_i}{\sigma_v^{2}+\sigma_\mu^{2}\delta'\delta},$$

$$\sigma_*^{2}=\frac{\sigma_\mu^{2}\sigma_v^{2}}{\sigma_v^{2}+\sigma_\mu\delta'\delta} \quad (19)$$

$\hat{U}_{it}=\hat{U}_i\cdot\hat{\delta}_t$, so we can get the technical efficiency estimation of each enterprise.

$$TE_{it}=\exp\{-\hat{U}_{it}\}=\exp\{-\hat{U}_i\cdot\hat{\delta}_t\} \quad (20)$$

and $\hat{U}_i$ is all the numbers and expectations.

The conditional expectation $\exp\{-U_{it}\}$ can be used to estimate the technical efficiency, there is

$$TE_{it} = E(\exp\{-U\}|\varepsilon_{it}) =$$

$$\frac{\Phi(U_{*i}/\sigma_* - \hat{\delta}_t\sigma_*)}{\Phi(U_{*i}/\sigma_*)} \cdot \exp\{-\hat{\delta}_t U_{*i} + \frac{1}{2}(\hat{\delta}_t)^2\sigma_*^2\} \quad (21)$$

When $T=1$ and $\gamma=0$, the model is degenerated into SFA model of cross-sectional data.

There are two parameters derived from σ_v^2 and σ_μ^2 in the SFA model:

$$\sigma^2 = \sigma_v^2 + \sigma_\mu^2,$$

$$\gamma = \frac{\sigma_\mu^2}{\sigma_\mu^2 + \sigma_v^2} \quad (22)$$

In some extent, the magnitudes of γ can reflect the influence of the V and U on ε.

IV. Variable Selection and Data Processing

In the existing literature, capital investment and labor input are the common methods to study the input-output efficiency, so capital and labor inputs are also used in this paper. The investment of R & D expense and R & D work has a direct impact on innovation performance and it is also the main factor. The total of R & D expenditures and R & D personnel is input variables and the input of new product sale is output indicator variables. Because there are periodic cycle due to technical innovation and a certain delay between input and output, the time difference between input and output indicators must be considered. For venture enterprises, the technological development should be based mainly on application and the development cycle is relatively short, in this paper the time lag is one year. So in this study, the input indicators is the total of the R & D personnel (*L*) and R & D expenditure (*K*) in the previous year (*Y*) and the output indicators is the new product sales income (*Y*). The experience model is:

$$\ln Y_{it} = \beta_0 + \beta_1 \ln L_{i(t-1)} + \beta_2 \ln K_{i(t-1)} + V_{it} - U_{it} \quad (23)$$

The selection criterion for selecting sampling enterprise are the followings: the enterprise has been founded by college students whose aim is profit and growth, it is at the start-stage and early growth stage, it can provide products and create some value, it is set up with a period of 1 to 10 years and is a new entity with legal personality. The enterprise began to grow and show some characteristics of organizational learning, the enterprise has the foreseeable future growth potential. To obtain more pattern results, we selected samples of 20 new establishments of 6-8 years start-ups to study. The sample data affected by economic crisis in 2008 was removed. Input indicators chose the data of the last year so the results do not include the innovation performance of the first year. Specific distribution of sample data is in Table I.

TABLE I.

SAMPLE DISTRIBUTION TABLE

The establishment life	life	Number of samples
	6	10
	7	4
	8	6
Industrial Distribution	Category	Number of samples
	Machinery industry	2
	Light industrial products	3
	Culture Media	9
	Other	6
Firm size	number of people	Number of samples
	<20	13
	20-50	4
	50-100	3
	>100	0

V. Empirical Studies

With the above model and the maximum likelihood method, all parameters and innovation performance of venture enterprises can be obtained by using the Frontier Version 4.1 software.

A. Estimates Results

TABLE II.

PARAMETER ESTIMATES

coefficient	parameters	standard-error	*t*-ratio
β_0	0.412	0.695	9.438
β_1	- 0.396	0.781	-8.647
β_2	2.061	0.451	4.968
σ_2	0.321	0.096	3.714
γ	0.959	0.001	3025.006
Log likelihood function	0.702		
LR test of the one-sided error	3.208		
number of cross-sections	20		
mean efficiency	0.627		

It can be seen from the estimates (Table II) that γ=0.959 t is very close to 1 and LR statistical test is below the 10% level. It shows that the random error term in the model includes composite structures of inefficiency factors. As for the panel data, the use of stochastic frontier production function is feasible and the model is acceptable. From the statistical results we know all parameters in the empirical model passed the 1% significance test. The innovation performance data of venture enterprises are in table III.

The overall average efficiency is 0.627 if the sales of new products are the output index. It indicates that the inefficiency factors account for 0.363 in process when the scientific and technological innovation changes into economic innovation performance.

TABLE III.

INNOVATION PERFORMANCE OF VENTURE ENTERPRISES

venture	Year 2	Year 3	Year 4	Year5	Year 6	Year 7	Year 8	average
1	0.632	0.693	×	0.977	0.797	/	/	0.775
2	0.688	0.588	×	0.687	0.912	/	/	0.719
3	0.723	0.300	×	0.315	0.671	/	/	0.502
4	0.573	0.674	×	0.920	0.684	/	/	0.713
5	0.321	0.534	×	0.587	0.425	/	/	0.467
6	0.766	0.895	×	0.699	0.825	/	/	0.797
7	0.387	0.523	×	0.579	0.456	/	/	0.486
8	0.800	0.522	×	0.514	0.612	/	/	0.612
9	0.201	0.623	×	0.223	0.480	/	/	0.382
10	0.361	0.436	×	0.608	0.390	/	/	0.449
average	0.545	0.579	×	0.611	0.625	/	/	/
11	0.810	0.972	0.700	×	0.743	0.901	/	0.825
12	0.358	0.809	0.486	×	0.569	0.732	/	0.591
13	0.690	0.820	0.714	×	0.713	0.869	/	0.781
14	0.590	0.674	0.733	×	0.881	0.918	/	0.759
average	0.668	0.733	0.714	×	0.727	0.855	/	/
15	0.678	0.751	0.630	0.622	×	0.576	0.700	0.66
16	0.958	0.568	0.846	0.975	×	0.522	0.886	0.803
17	0.347	0.558	0.703	0.563	×	0.796	0.550	0.586
18	0.257	0.698	0.698	0.777	×	0.752	0.850	0.672
19	0.494	0.679	0.510	0.590	×	0.578	0.558	0.568
20	0.240	0.257	0.340	0.480	×	0.492	0.536	0.391
average	0.507	0.585	0.621	0.668	×	0.619	0.680	/
total average								0.627

Note: × is the removed data in 2008.

Personnel and funding in the innovation activities is two input factors and the output elasticity from the two input factors is -0.396 and 2.061 respectively. Funds elasticity is greater than l and has the scale effect; innovation capital (innovation funds) is increased by l%.

It can be seen that the industrialization of scientific and technological achievements of the selected sample enterprises has the scale effect. The innovative staff input has the negative effect. For example, the new products sales input is decreased by 0.396% when an innovator has the growth by l%. There are some reasons: the unreasonable innovative staffing configuration, some of the smaller business have greater randomness efficiency, personnels engaged in scientific and technological innovation can not reach the level required by the existing level of technology hardware and so on. Therefore, venture enterprises should pay more attention to the improvement of human resources and rational allocation when they are increasing the capital investment and the industrialization.

B. Results

From the measurement results we conclude that innovation performance has a big gap between the selected samples with the maximum being 0.977, while the minimum being 0.201, which illustrates the innovation performance, is imbalanced. The imbalance has a close relationship with some factors such as the development stage, engagement in the industry, the scale of development, government support, and external environmental impact and so on.

From the cross-section it can be seen that the average innovation performance of venture 11 is the highest (0.825) and the venture 9 is the lowest (0.382). The venture 11 is the culture media enterprise in which almost all the personnel are involved in R & D and the product updates faster. The venture 9 is a traditional light industry enterprise and the innovation performance is difficult to have a major breakthrough, which is consistent with the actual situation. Because venture enterprises of non-venture enterprises has the support of early accumulation by the founder, the enterprises can maintain stable innovation performance such as venture 14 and 20.

There is obvious upward trend from the time series and the benefit from the technology innovation in the growth stage of venture enterprises is more and more obvious. In 2009, mechanical processing industries had severe shocks by economic crisis and there is no significant improvement in sales revenue. In 2010, With the global economic recovery, new products accounted for most of the market and there is a substantial increase in innovation performance. Media industries and catering industries are seizing the opportunities brought by economic crisis to launch new products, so the innovation performance did not fall but rise.

C. Results Analysis

Currently the government pays more attention to the starting business for college students and provides with a

series of supporting policies. But because of influence of social factors such as fund, experience and social network while college students start business, they will encounter some difficulties. Thus it is hard for venture enterprises to insert or form social innovation network, which leads to worse innovation performance for enterprises.

According to average performance of 6-8 year enterprises (Figure 1), it is very obvious that innovation performance rises with time going away.

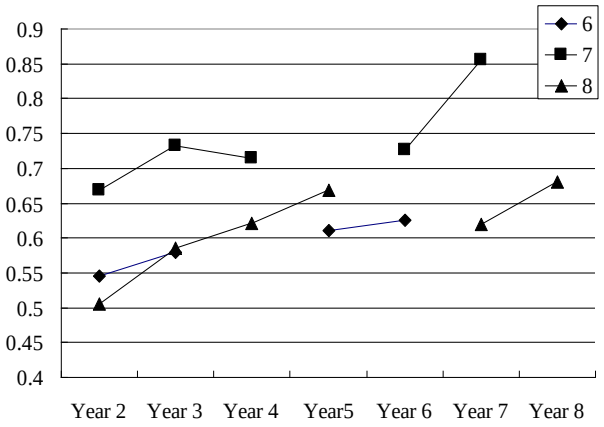

Figure 1. The average innovation performance of 6-8 year enterprises

Innovation performance rises obviously in the beginning, and then rises slowly, then rises clearly again in the seventh or eighth year. The reason is that college's student's venture enterprises are built while the found are at school or just graduated. These kinds of enterprises have worse creative ability and base. But they will have clear effect. Due to instability, enterprises need lots of investment to get into innovation network and gain resource they need. So whey have a slow rise period. As enterprises insert innovation network, innovation performance will have a clear development and at last get into stable stage of innovation performance.

In terms of individual enterprise, most enterprises have a rising development condition of innovation performance. However, some enterprises have unstable development condition as they get influences of limit of industry, economic environment, force majeure. These enterprises are supposed to look at resource and develop the ability to resist risk. They are able to promote by optimize innovative ability.

Most of enterprises in this study are media enterprises, while few are mechanical working enterprises. Because media enterprise has little investment with lower doorsill, they become important object for the college students' enterprises. But these kinds of enterprises survive hardly in society without good creative ability. Media enterprises 'innovation performance keep better or a undulate condition among sample enterprises, which means these enterprises have serious risk. If they have no center skill supporting, these enterprises are not supposed to be built.

Through comparison of innovation performance from 8-year enterprises (Figure 2), among college students enterprises, mechanical working enterprises' innovation performance is lower but stable, but they get rich innovation cost, innovation network have comparatively stable condition, which make new enterprises cannot develop fast in the short time in innovative reform. While light industry is between media enterprise and mechanical working enterprises.

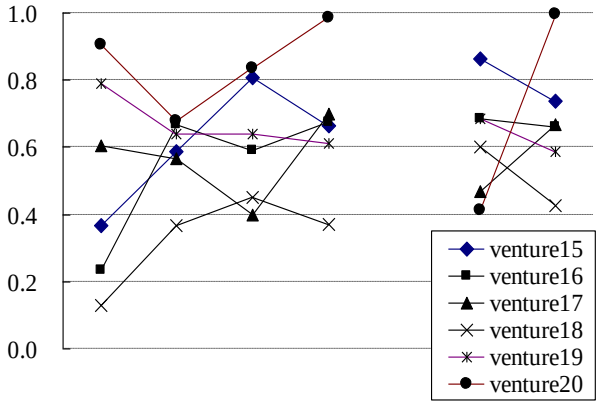

Figure 2. The comparison of innovation performance from 8-year enterprises

VI. Strategy of Improve Venture Enterprise' Innovation Performance

A. *Optimize the Environment and system of Venture Enterprise*

Because of absence of the necessary business support measures, rules and regulations, local governments should implement long-term strategy and policy to promote entrepreneurship, and strengthen the business environment through the development of a series of policies and regulations to guide and support of university graduates start their own businesses. The execution of the policy is also should be enforced, because some local governments and relevant units as well as colleges and universities did not actively execute, although there are many policy to encourage and support the entrepreneurial university. Role of venture environment on new venture performance is very significant, and their effects and explanatory power are higher than mature companies, which moderated by environmental dynamism [23].

B. *Strengthen Propagation to Guide Public Opinion*

We should widely publicized through a multi-faceted way, such as offering a business policy course in the university and increasing business policy propaganda through newspapers, television, Internet and other media , so that more students understand the content of the policy. School and other institution should be supported and offer the opportunity to practice to students through entrepreneurship competition and entrepreneurship training. Another side is that reminding entrepreneurs entrepreneurial risk rather than exaggerating entrepreneurial success, to avoid giving students wrong hint of easy to start a venture enterprise.

C. Broaden the Financing Channels, to Simplify Lending Procedures

Through the survey, the greatest difficult for college students starting their own businesses is lack of funds. Students usually have no time and effort to accumulate the necessary venture capital, because they must finish their studying. So the Government, banks and enterprises could play the role of providing financial support to college students.

Government can support college students start venture enterprises using annual government budget, in addition, establish appropriate institutions and credit management platform, lead banks and other financial institutions to broaden the platform and secured financing platform to reduce the university business loans threshold. All of this way can help students resolve the lack of venture capital.

D. Cultivation of Pioneering Spirit and Ability in University Students

We should guide and encourage students to develop their personality in university education. College students can learn some experience and principles about enterprising knowledge, such as how to create venture enterprises and how to fund, though the course of venture enterprises (marketing, finance, communication skill, law and regulations).

They can also be cultivate the entrepreneurial awareness and qualified of identify problems, analyze problems and problem-solving skills through the establishment of business associations, setting up a business park, and carrying out business plan competitions, etc, to enable students to master the entrepreneurial skills and resolve practice problem. They can make field research or involve in the practice in enterprise to learn first-hand experience of the entrepreneurs and business operations experience. Meantime, students can improve self-awareness, sense of participation and innovation, to stimulate the enthusiasm of their participation in entrepreneurial activities.

VII. CONCLUSIONS

The innovation performance of venture enterprises will gradually increase with the growth of enterprises. College Students' venture enterprises in different sectors may either suffer the enormous losses or seize great opportunity due to the influence of the external environment. In addition, the innovation performance will have greater bias due to the size and category of industries. The media business may usually find high innovation performance and is of high risk, which is favored by the students. And low innovation performance is found in the mechanical industry but relatively stable. While the light industry enterprises' innovation performance and risk ranks between media business and mechanical processing enterprises.

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