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Can Entrepreneurship Be Measured?

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ABSTRACT

The research paper groups entrepreneurship as either conceiving or performing. Some arguments performing entrepreneurship can be measured while conceiving entrepreneurship cannot. In conceiving entrepreneurship, the concepts and thoughts of doing business can be observed. Performing entrepreneurship is the real application of these thoughts and ideas, which can be measured by outlining the trail or footsteps of the entrepreneur (Foss and Klein, 2005). This paper shows that several sign measures of performing entrepreneurship can be selected by applying the confirmatory factor assessment under the approach of latent-variables sculpting.

Keywords: Entrepreneurship, Measuring Entrepreneurship, Performing Entrepreneurship
JEL Classifications: O3, O31, O310

1. INTRODUCTION

Cantillon first used the word entrepreneur in 1775 (Foss et al., 2007). Since then, many researchers in different academic the fields have considered entrepreneurship significant in the study of business. Entrepreneurship is perceived important in technological, economic, and social enhancement.

However, no researcher has proved the importance of entrepreneurship on social enhancement.

Economics is a sector with a well-structured set of mathematics tools. Ironically, economists and mathematicians have not been able to choose appropriate measures of entrepreneurship. The available information on entrepreneurship educations contains minimal studies majoring in enhancing measures of entrepreneurship. The disappointment of adopting relevant measures of entrepreneurship is one of the biggest factors that hinder steering impact assessment and examining hypotheses of those factors. It is assumed that the nature of entrepreneurship contributes to the trouble of measuring entrepreneurship. The big question remains, Can entrepreneurship be sensibly measured?

While appreciating that the dynamic and idiosyncratic state of entrepreneurial activities may have a part in the troubles of measuring entrepreneurship, possible measures can still be selected by more grouping of entrepreneurship and keenly outlining of the tracks of entrepreneurs. Therefore, this research categorizes entrepreneurship as conceiving and performing entrepreneurship. The previous information is unobservable, but the latter can be traced and measured. In addition, by taking into consideration the different nature entrepreneurial activities, this paper supports that measures of entrepreneurship and means of evaluation should be made wisely.

The latent variable method is used to measure the performance of entrepreneurs in the situation of technological, entrepreneurial activity. A confirmatory factor assessment (CFA) is used and the credibility of the suggested approach construct for measuring great technology entrepreneurship is examined. In the research, performing entrepreneurship is evident by four signs. Facts and figures from all the 50 states of America are gathered and applied in the empirical experiment of hypothesized model. The outcomes of the assessment prove that the suggested measurement approach fits the figures fine in the level of statistical importance (Bagus, 2015). This research proposes that measures of entrepreneurship can only be achieved with a flawless grouping of different entrepreneurial activities. The latent variable model is revealed as a good method for selecting measurement of performing entrepreneurship in the situation of technology companies. The latent variable approach can be used to research other categories of entrepreneurship.

2. METHODOLOGY

In many types of research and studies, scholars have emerged with many ideas that cannot be directly measured, for example, self-esteem and intelligence. Although these notions can be neither observed nor measured, statisticians have been forced to adopt a framework known as latent variable modeling to tackle the vaguely described notions. In this approach, the notions that cannot be directly observed and referred to as latent variables, but the observable ones are applied as indicators of the unobservable ideas.

For instance, human intelligence is an unobservable notion but SAT marks and GPA can be applied as indicator variables to prove intelligence (Sandberg et al., 2013). In the same way, entrepreneurship is an unobservable notion, which can be dealt with as a latent variable. Therefore, in this research, the framework of latent-variables modeling is the favorable methodology.

There are many entrepreneurial practices, and a majority of them cannot be traced yet there are still main footsteps left behind by entrepreneurs. According to Harwley, entrepreneurship relies on ownership rights. Gartner and Shane have implemented the quantity of institutions per capita as a pointer of entrepreneurship. The pointer can be applied as a measure of entrepreneurship because the birth of the company or business is a unique milestone of fresh commerce undertaking and a significant institutional way of entrepreneurs to perform their duty (Foss and Klein, 2005). Recognizing the significant effort made by Gartner and Shane in measuring entrepreneurship, the quantity of institutions per capita as the pointer of entrepreneurship may not be sufficient to prove because entrepreneurs execute significant economic duties before and after the company is created.

This research examines the latent variable model to enhance measures of acting entrepreneurship in the aspect of technology entrepreneurship in America. I have applied four indicator variables, which are the quantity of technology patents (PATENT), the sum of little business innovation rewards (SBIR), venture capital expenditures (VC), and the quantity of technology launches (NTE) to proof the latent variable and performing technology entrepreneurship (PE) (Byrne, 2013). The research also includes the quantity of fresh commodities and services established as an additional indicator variable, but information on such a variable is not available.

Grounded on the selected indicator variables, I carried out an empirical experiment of the measurement approach to analyze performing technology entrepreneurship by applying the confirmatory factor assessment (CFA) in the framework of the latent variable procedure. This measurement model can be expressed mathematically through the following group of equations:

$$PATENT = \lambda 1PE+\delta 1 \quad (1)$$

$$SBIR = \lambda 2PE+\delta 2 \quad (2)$$

$$VC = \lambda 3PE+\delta 3 \quad (3)$$

$$NTE = \lambda 4PE+\delta 4 \quad (4)$$

This assessment through empirical examining of the latent variable approach is different from the old statistical scrutiny since it is purposed to disclose how good the assumed approach construct fits the figures and facts. The credibility of the suggested approach is examined based on trial facts and figures of all pointer or observable variables. Such credibility examined by a group of statistical measures known as goodness-of-fit between the assumed approach and the trial information. In a typical method, a researcher inflicts the structure of the suggested approach to the trial information and then examines how fine the observed trial information fits the constrained approach structure. Whereas the divergence between the approach and the information is symbolized by the residual, the model fitting formulae used can be defined as:

Data = Model + residual

Arithmetically, the approximation process in latent variable modeling is resulting from the comparison between the covariance matrix of the seen variables and the covariance matrix of the fundamental factors (Henseler et al., 2015). The main concentration of the definite approximation is to create parameter values that limit the difference between the trial covariance matrix of S and the population covariance matrix symbolized by $\Sigma(\theta)$. The most appropriate equation used is:

$$FML= \log|\Sigma(\theta)|+TR(S\Sigma\text{-}1(\theta))-\log|S|\text{-constant} \quad (5)$$

3. RESULTS AND FINDINGS

Facts and figures for the indicator variables are gathered at America state level in technology companies and parts. Given that the information and communication technologies and the biotechnology hugely symbolize fresh technologies, information on these dual sectors is specifically removed. The quantity of technology establishments is grounded in the North American industry classification system codes to describe both the ICT companies and the Biotech companies (Sarasyathy and Dew, 2013). The quantity of creations on these codes is gathered from the American Fact-Finder, America Census Bureau and the information is topped on per capita grounds.

The quantity of technology patents is centered on thirty-two technology patents grouping which contain both the ICT and Biotech companies. The America patent and trademark department gives the information, and the mean quantity of patents between 2000 and 2004 on a per capita foundation is applied in empirical examining. Information on venture capital investment for ICT and Biotech are gathered from the SDC software. The results found in this research can be described as in the Table 1.

The equations and functions described in this part of the research were used to perform the arithmetic to come up with more reasonable and applicable results. The actual results from the

Table 1: Venture capital investment

Variable	N	Minimum	Maximum	Mean	SD
PATENT	50	0.020473	2.213117	0.30930654	0.378467702
SBIR	50	0.016615	0.586684	0.09393636	0.099163712
VC	50	0	3.206873	0.360245	0.578126853
NTE	50	0.339456	1.413815	0.72130275	0.256365579

SD: Standard deviation

model output met the principles of the proposed values of a good fit. In summary, the suggested confirmatory factor assessment approach in measuring acting technology entrepreneurship is credible.

4. DISCUSSION

The research has confirmed that entrepreneurship can be measured by correct groupings and trace the trails of entrepreneurial deeds. However, the nature of entrepreneurship also plays a part in the trouble of measuring entrepreneurship (Foss and Klein, 2005). One can determine whether an entrepreneur has best entrepreneurial skills by simply observing his deeds and the operation of their firm. For instance, some individuals may take longer to succeed in their businesses while others may take a short time. If the two individuals started their businesses at the same time and under the same category of business; if all other factors are held constant, then the individual whose business succeeded faster than the other has a higher entrepreneurship measure than the other one.

For a businessperson to have great entrepreneurship measure, the person must have the appropriate knowledge and skills about entrepreneurship (Tiago et al., 2015). This means that he considered all factors before starting his firm. He looked into issues that might hinder the success of his company and minimized them. He also evaluated the factors that may encourage the success of his company and exploited them to his advantage. Therefore, great entrepreneurship measure is not just coming up with a good business idea. It involves deeds and actions before and after the creation of the firm.

After the entrepreneur has come up with the business idea, considered the strengths and weakness of the idea, and started the firm, he has now to manage and operate his business appropriately to achieve a good entrepreneurship measure. The one important thing entrepreneurs must have in mind while operating their businesses is to be professional. Mixing external factors such as friendship with business is dangerous.

Timekeeping is another factor that may affect the operation of business. Entrepreneurs with great entrepreneurship measure have a habit of respecting their working hours. They operate within their working hours. They do not come late to work or extend their working hours unreasonably.

It is clear that it is difficult to measure entrepreneurship, but one can approximate through the activities outlined. Therefore, one has to be keen on the activities of the entrepreneur to be able to approximate the measure of entrepreneurship (Foss et al., 2007). Observable variables can be identified, for instance, you can easily observe whether an entrepreneur is reporting late at work or not, and whether a business is progressing or not.

Confirmatory factor assessment in the framework of latent variable approach has revealed a believable means of choosing pointer measures of executing entrepreneurship (Ferreira et al., 2016). With such choices of measures of entrepreneurship, the empirical trial of assumptions on factors that may add to the advent and act of entrepreneurship becomes likely to proceed. Two methods of doing these empirical trials may be proposed. One is to examine hypothesis by applying a complete latent variable approach that includes the measurement approach and the structured approach, involving dependent and independent variables. One approach structure involves both unobserved and observed variables to its advantage. Observable variables are ones that can be seen while the unobserved ones are those just assumed or hypothesized.

A complete latent variable approach needs a huge sample of information. Therefore, this approach cannot be used where information is not readily available. Researchers must make sure that they have all necessary information or have their trustworthy source before deciding to use this approach in their study.

Additionally, unavailability of data has been the chief shortcoming for this approach. Some information is restricted, and not all researchers can access it. There are several instances where researchers stuck in the middle of their study because of lack of appropriate information. However, in such situations, one may have an alternative. The researcher can still customize one dependent variable formulated on the standardized aspect heaping marks gotten from similar confirmatory factor assessment and then finish by applying the use of an old multivariate approach in hypothesis examining (Foss and Klein, 2005).

Additionally, the measures discussed in this research can be applied as a benchmark of entrepreneurial practices in the United States and other countries. The results obtained in this research can be used in calculating other aspects such as the performing technology entrepreneurship index. However, every measure has its advantages and disadvantages, which make it necessary for a careful comparison before choosing any measure.

5. CONCLUSION AND RECOMMENDATIONS

The first recommendation targets the researchers who intend to carry out their study using a complete latent variable approach to be equipped with enough information before starting their study. I recommend the access to some information to researchers and scientists who have a positive motive for their doings.

They should be given the priority of accessing the restricted information. Researchers must carefully analyze every measure in their research since all have their merits and demerits that will influence the procedure. I strongly recommend the use of many observable indicators as indirect measures of executing entrepreneurship rather than using a single observable indicator.

Finally, the suggested confirmatory factor assessment approach in measuring performing technology entrepreneurship is credible since it has provided relevant and believable results as shown in my results.

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