

Analysis of Entrepreneurship in Industrial Cluster

Wen-Hsiang Lai

Abstract—Except for the internal aspects of entrepreneurship (i.e. motivation, opportunity perspective and alertness), there are external aspects that affecting entrepreneurship (i.e. the industrial cluster). By comparing the machinery companies located inside and outside the industrial district, this study aims to explore the cluster effects on the entrepreneurship of companies in Taiwan machinery clusters (TMC). In this study, three factors affecting the entrepreneurship in TMC are conducted as “competition”, “embedded-ness” and “specialized knowledge”. The “competition” in the industrial cluster is defined as the competitive advantages that companies gain in form of demand effects and diversified strategies; the “embedded-ness” refers to the quality of company relations (relational embedded-ness) and ranges (structural embedded-ness) with the industry components (universities, customers and complementary) that affecting knowledge transfer and knowledge generations; the “specialized knowledge” shares the internal knowledge within industrial clusters. This study finds that when comparing to the companies which are outside the cluster, the industrial cluster has positive influence on the entrepreneurship. Additionally, the factor of “relational embedded-ness” has significant impact on the entrepreneurship and affects the adaptation ability of companies in TMC. Finally, the factor of “competition” reveals partial influence on the entrepreneurship.

Keywords—Entrepreneurship, Industrial Cluster, Industrial District, Economies of Agglomerations, Taiwan Machinery Cluster (TMC).

I. INTRODUCTION

STARTING from Schumpeter onward, there had been many definitions in describing an entrepreneurship, and the benefits entrepreneurship holds for economic development in a country or for a company where entrepreneurship been conducted. Schumpeter defines entrepreneurship by emphasis on innovation such as, new products, new production methods, new markets or form of organization. Reference [1] defines entrepreneurs as the individuals who exploit market opportunity through technical and/or organizational innovation. Entrepreneurship usually holds for economic development in a country or for a company where entrepreneurship has been conducted, and entrepreneurship is also emphasized on base of industrial innovation, such as new products, new production methods, new markets and new form of organization, and requires changes in the pattern of resource deployment and the creation of new capabilities to add new possibilities for positioning in markets.

Most Taiwan machinery cluster (TMC) firm were founded in 1980s, industry leaders include Leadwill, Victor, Yeong Chin, Roundtop, Yang Iron Works, Fair Friend, Falcon, Dah Lih, Tongtai and She Hong. In early 1970, Alice Amsden came to

Taiwan and in her study; she wrote that in the coming years most of the island’s small producers would be lost in a shakeout. Reference [2] stated that Taiwan success factor in machinery industry because of having the right country to copy and at a critical time. Although Taiwan’s machinery cluster is not as popular as Taiwan’s semiconductor industry, but machinery industry has been believed as one of the main factors for Taiwan economy growth. Since, Taiwan is world’s fifth largest producer of machine tools and fourth largest machine tool seller (after Germany, Japan and Italy), In 2008, Taiwan’s machine tool industry reached US\$ 4.8 billion, this because that 75% of machine tool output is exported to other countries like China, US, European countries and other Asian Countries mostly as an OEM manufacturer.

The motivation of this study is the curiousness of venture creation phenomena, what are the primary factors for new venture establishment, how to sustaining this new breeds to become a competing mature firms, and in some occasion been introduced by industrial cluster concept. At glance, industrial cluster concept (firms would get the benefits economically from agglomerating together) felt could be fill up the questions. As this thesis been written in one of the country that attracted many scholars for the industrial cluster that supporting the economic development, Taiwan, thought to be a splendid opportunity to studying both entrepreneurship and industrial cluster. As could be seen in researches, taking industrial cluster or agglomeration as research topic usually resides in the phenomena of firms converge together in a region boundary which serve the similar industry. When some scholars would focus on the advantages and disadvantages by agglomerated together, the others would take the effects of industrial cluster to the other economic aspects (such as innovation and competition). However, what are the effects of cluster to new business formation? Many new companies grow up within an existing cluster rather than at isolated locations. Individuals working within a cluster can more easily perceive gaps in products or services around which they actually build their businesses. This study involves firms in TMC and uses questionnaire as a research tools/method in examining the gathered data to assess the hypotheses.

II. LITERATURE REVIEW

In the era where industries are becoming more dynamic, opportunities to create new product or process become more open. This kind of phenomenon nourish the entrepreneurship in many industries and when this kind of act bring in the development of a firm which has been argued by many scholars that will affect company sustainability in the industry and economy development in many countries [3], [4]. Because of the dynamic and open opportunities, developing a spatial

Wen-Hsiang Lai is a Professor in the Graduate Institute of Management of Technology, Feng Chia University, 100 Wenhwa Rd. Seatwen, Taichung 40724, Taiwan ROC (e-mail: whlai@fcu.edu.tw).

environment (geographical areas) nourishes the entrepreneurship by creating more opportunities and having the knowledge sharing and spill-over from firms in the cluster with or without government intervention [5]. Traditional theories of entrepreneurship basically restrict their attention to the profit-seeking motivation behind entrepreneurs. The neoclassical tradition considers market economies as systems in which equilibrium is achievable and represents them as such. The role of entrepreneurs is then merely a function of coordination of resources and calculation of the profit maximizing output.

Accordingly, the core of the theory focuses on the “demand for entrepreneurship” and is mainly determined by profit opportunities available in the market. In other words, the traditional explanation of entrepreneurial activities merely refers to the existence of some unexplored opportunities for profit [6]. Reference [7] defines entrepreneurship as the process by which organizations renew themselves and their markets by pioneering, innovation and risk taking. Reference [7] also finds the relation of entrepreneurship in different types of firms (i.e. simple firms, planning firms and organic firms). Therefore, entrepreneurship can be defined as the firm process or individual acts (owner manager) in path to own their business (new business creation), organization renewal, and business sustainable or market leader that should covering innovations, risk taking and pioneering in the process.

In the studied of innovation and spatial fields, many scholars try to find out if there are any relations for innovation to be more flourish in one geographical area comparing to the others. Within the new empirical literature, there is an appreciation for locational context and the diversity of landscape that condition economic activity. This concept of location is now being defined as a geographic unit over which interaction and communication is facilitated, search intensity is increased and task coordination is enhanced. Industrial cluster or business cluster is a geographic concentration of interconnected business, suppliers and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally. Reference [8] states that the purpose of having the business cluster is to increase the productivity, to drive innovation, and to stimulate new business in the field. Based on the various contributions in literature on industrial districts, [9] concludes that industrial clusters can be identified by four stylized facts: a group of geographically concentrated and specialized small and medium-sized enterprises, a common behavioral code because the actors are linked by the same cultural and social background, a set of linkages between enterprises based on the exchange of goods, services, labor and information and a network of public and private local institutions which support the actors in the cluster.

A final theoretical approach explains the existence of industrial agglomerations from the perspective of organizational sociology. Here, sociological and cognitive effects are resources needed to start a firm if it is located far away from those resources. This organizational sociology increases the entry rate in clusters, but is not necessarily

coupled with enhanced performance for those newly started firms. Locally increased ease of entry and exaggerated expectations of success would therefore account for cluster formation [10]. In a study of the US shoe industry, [11, p. 427] finds that both entry rates and failure rates were higher among concentrated plants and conclude that “variation in the structure of entrepreneurial opportunities, rather than variations in the economics of production and distribution, maintains geographic concentration in the shoe industry”.

Reference [12] conceptualizes the framework for the phenomenon of the new venture creation. Gartner also states that there are four factors describing the phenomenon of new venture creation. The first factor is “individual” factor, which refers to the personal factors involving in starting a new organization; second factor is “organization” factor, which refers to what kind of firm that is started; the third factor is “new venture process”, which refers to the actions undertaken by the individual to start the venture; the fourth factor is “environment” factor, which describes as the situation surrounding and influencing the new organization. This study focuses on the environment factors (cluster) of entrepreneurship, which encourages innovative action and typical region that highly supports the entrepreneurial process. Cluster is a particular factor within business regions and helps newly-built companies to overcome the entry barrier.

Competition, as the strategic action by firms in the related industry in purpose to gain market share or position their company in the market, positively could nourish innovation which would bring the growth to the industry in ways making the company to take the differentiate product or process. In their studies, [13] states that firms would differ into low-cost strategy firms (economic firms), and differentiate firms (up-scale firms) and they believe that co-located with the firm with high-level differentiation would bring advantages to have not to take the differentiate investments, and low-cost firm in the cluster would reap the benefit from co-located with differentiate firms. Taken in entrepreneurship studies writer arguing a hypotheses

Hypothesis 1a: *The up-scale firms (differentiate) based cluster would give positive effect to entrepreneurship in the cluster compared with economic firms based cluster.*

Firms that located within cluster could gain advantage for specialized inputs and employees because of the lower-cost access to specialized inputs such as components, machinery, business services, and personnel, the flow of information and knowledge between units of the same company, and the complementarities among firm whether in form of product or services. Cluster could make many inputs that outside would be costly into public goods, for example firms could gain benefits, such as specialized infrastructure or advice from experts in local institutions at low cost. Clusters also give an indirect incentives and performance measurement by having the firms locating in the closed placed, make firm would make a constant rival comparison this will give the motivation (incentives) to the firms and having their performance been measured.

Hypothesis 1b: *Competitive advantage in form of static productivity would give positive effect to entrepreneurship*

inside the cluster.

In [14], embedded-ness could be illustrated in social daily life transaction in which people choose to have transaction with people their known well because of the reasons of reliability and mutually understanding that are learned from prior experiences. In [15], embedded-ness on Indian software industry, identified that the two types of embedded-ness could be found in industrial cluster, which are relational embedded-ness and structural embedded-ness.

Concluded from prior discussion, that relational embedded-ness could bring the advantages for firms in which could not be accomplished within personal or firm level. Reference [14] finds that relational embedded-ness bring the spillover into the transactions between trading partners within the network. Reference [16] finds the effect of competition on embedded-ness could find that “non-rival foreign subsidiaries embed their operations in the host economy to a greater extent than rival ones, consistent with the unintended spillover argument”. Also relationship closeness between constituents (suppliers, customers, and other counterparts) will improve the subsidiary’s ability to absorb new knowledge from the environment.

Hypothesis 2a: Relational embedded-ness would give positive effect to entrepreneurship.

The concept of structural embedded-ness in cluster could demonstrated in both cohesive internal linkage (closure) and in the external diverse linkage (range), while closure showing the transmission of fine-grained information and action coordination, range determine the novel information and knowledge and therefore nourish innovation in cluster. The similar argument been stated by Y.H.D. Wei et al. on their studies on China network configuration which influencing R&D activities in Suzhou, found out that “the weak local embedded-ness has technological, structural, spatial and institutional foundation, which limit the establishment of knowledge ‘pipelines’ with global innovation centers”.

Hypothesis 2b: The level of structural embedded-ness would give positive effect to entrepreneurship in the cluster.

Reference [19] states the concept of external economies has held a central within geographical accounts of the spatial concentration of economic activity. The other argument been made by [17] which stated that the resulting demand effects within industrial agglomerations benefits the creation of new firms because proximate customers not only increases the likelihood of sales but also minimizes transportation costs. The localization of specialized suppliers and the ease of transmission of knowledge and information flows have been considered the most relevant causes for the existence of “external economies” in a region. Firms want to locate in a local area where they are likely to find the specialized skilled workforce they need. Consequently, employees would move to areas where employers look for such specific skills, contributing to the self-reinforcement of this process. Moreover, customer firms and suppliers gain by locating close to each other both because of savings in transportation costs and because of backward and forward linkages that generate positive feedbacks. Finally, the process of clustering enables

the firms to profit from some knowledge diffusion.

Hypothesis 3a: Flexible resources (such as labors) in the industrial cluster would give positive effect to entrepreneurship.

Reference [17] states that the resulting demand effects, in form of proximity with customer within industrial agglomerations benefits the creation of new firms because the increasing of the likelihood of sales and minimizes transportation costs. In here the argument by [17] argued the important of industrial cluster in supporting entrepreneurship by having the demand effects which is lowering the transportation cost and increasing the likelihood of sales. By having the pool of demand, new venture creation would be attracted to place their firms inside of the cluster.

Hypotheses 3b: The demand effect of industrial cluster (lowering transportation cost and increase the likelihood of sales) would give positive effect to entrepreneurship.

Fig. 1 shows the research model in this study.

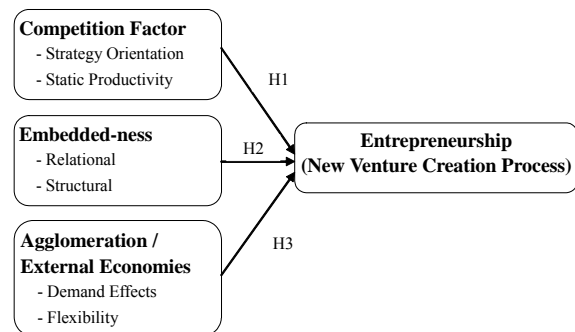


Fig. 1 Research Model

III. METHODOLOGY

This study takes a sample of machinery cluster industry in Taichung city, Taiwan. The reason of choosing machinery industry as a sample is that TMC is one of the top in the world, second, the machinery cluster in Taiwan was not build by government intervention, in this the research objective would hopefully more obvious, third, data gathering will likely more plentiful and convenient. In assessing hypotheses, quantitative methodology is chosen, the quantitative methodology been chosen to analyze this research is multiple regression analysis. Have a basis on the research purpose, focus on the relation between the independent variables (cluster factors) and the dependent variable (entrepreneurship in the cluster), multiple regression analysis basically should provide some results which would support or not support the argued hypothesis. Table I shows the model descriptions in this study.

TABLE I
MODEL DESCRIPTION

Factors	Definition
Competition Factors	Competition in the industrial cluster which affecting the new venture creation.
Strategy Orientation	The strategic action choose by the firms in the cluster, noted that the upscale or differentiation.
Static Productivity	The advantage gain by the firms in the cluster in form of static productivity (access to specialized inputs and employees, access to information and knowledge, complementarities, access to institutions and public goods, and incentives and performances measurement)
Embedded-ness	Reference [15] argues that embedded-ness is one of the keys determinants of industry clusters.
Relational Embedded-ness	The relation of two constituents (refers as quality). This relational embedded-ness would benefits entrepreneurship by supporting the knowledge spillovers.
Structural Embedded-ness	The structural embedded-ness would refer to the range of the relations. Structural embedded-ness supporting the innovation through diversified range of relation firms and access to novel knowledge.
Agglomeration Effect	The economic benefits that gain by locating in close range.
Demand Effect	The demand effect of industrial cluster (lowering transportation cost and increase the likelihood of sales) would positively attract the venture creation inside of the cluster.
Flexible Specialization	Flexible resources (labors) in the industrial cluster would converge in the cluster especially which skills in accordance with the industry, support the new venture creation process in reason of the needs of skilled labors could easily fulfilled.

IV. RESULT ANALYSIS

In estimating the suggesting hypothesis, questionnaire method has been used in gathering data through the email list and distributing closed to companies that located in Taichung area. Four hundred fifty emails had been distributed gradually, around 50 emails each day, to random companies in Taichung areas with 142 respondents. Which respond rate (around 30%) is count as acceptable for analyze the data.

Questionnaire was created into two parts, the first part consists of general descriptive questions and cluster features, and second part contains questions to assess the effect of suggested cluster features (competition, embedded-ness, and externalities) to the entrepreneurship. Personal descriptive questions were asked in the questionnaire such as, age, gender, education degree, working experience, company established time, and in company job position. Other questions related to the cluster main features that companies perceived support company's establishment. Such as, the presence or absence of specialized material suppliers, high demand of company products, specialized skilled labor supply (university, education institution, etc), and inter-firms collaboration in purpose of new knowledge creation.

As shown in Table II, the data could be considered as acceptable data because looking through the background of the respondents, 50.6 percent are on the job position level included in the company decision making, 40.1 percent had more than 10 years in job experience with only 2.0 percent on less than 2 years experiences, and most of the companies (61.2 percent) had more than 10 years experiences, only 1.3 percent are new entrant company, the others had 3 to 5 years and 6 to 10 years experiences.

TABLE II
DATA DESCRIPTION

Attribute		Frequency	%
Gender	Female	65	45.8
	Male	77	54.2
Age	26 – 35	44	31.0
	36 – 45	61	43.0
	46 – 55	37	26.1
Degree	High School	2	1.4
	Under Graduate	11	7.7
	Graduate	102	71.8
Position	Post Graduate	27	19.0
	Staff	68	47.9
	Manager	50	35.2
Senior Manager	CEO	15	10.6
	CEO	9	6.3
	CEO	9	6.3
Job Experience	1 – 2	2	1.4
	3 – 5	42	29.6
	6 – 10	40	28.2
Company Established Year	>10	58	40.8
	1 – 2	2	1.4
	3 – 5	12	8.5
Company Established Year	6 – 10	39	27.5
	> 10	89	62.7

From the data gathered from the questionnaire as the cluster feature perceived by companies in Taichung industrial cluster that for three features such as specialization in material suppliers for company's product, inter-firm collaboration on new knowledge creation, and specialized labor supply through educational institution was supported (above 70% of the respondents agree that in Taichung area they could perceived this cluster's features). But, in the high demand for companies product from inside the cluster was not supported (below 50% of the respondents agree with this feature that could be perceived inside the cluster). The result from all this questions is summarized into table formed and explained below. Table III shows the cluster features in this study.

TABLE III
CLUSTER FEATURES

No.	Item	Mean	SD
	Strategy orientation	3.31	0.85
1.	The competition between companies give positive effect to company growth	4.05	0.64
2.	Company is more willing to choose low price strategy than differentiated strategy in establishing new company.	2.17	0.78
3.	Differentiated competitions give benefits to company with low price strategy.	2.44	1.04
4.	In long period, low price strategy gives negative effects to industry.	4.12	0.92
	Competitive advantages	3.95	0.80
5.	Local government policy is positively affecting to the company establishment.	3.94	0.64
6.	Supporting infrastructure (access road, telecommunication line, etc.) which had been built is positively affecting to the establishment of company	4.00	0.75
7.	Local culture is positively affecting to the company establishment.	3.78	0.87
8.	Local labor productivity is positively affecting the company establishment.	4.05	0.99
9.	Land / construction cost is positively affecting the company establishment.	4.00	0.76

The embedded-ness factor shows the network between industrial cluster components that will affect the entrepreneurship which divide into two elements relational and structural embedded-ness. Like the other questions in this study is made using the five-point Likert scale. The first five questions had been made by focus on the connection on relational embedded-ness (the quality of firms' relation) to entrepreneurship and the last five questions had been made by focus on the structural embedded-ness effect to the entrepreneurship. The relational embedded-ness had the overall mean score at 4.15 and standard deviation at 0.75. Among the five elements of relational embedded-ness the highest mean score ($M = 4.33$ and $SD = 0.68$) come from the question that the quality of firms relation would create new opportunity for companies. And the two lowest elements come from the questions if with the quality of firms relation the company would effect on the knowledge sharing ($M = 4.05$ and $SD = 0.88$) and capital investment ($M = 4.05$ and $SD = 0.64$). The structural embedded-ness had overall mean score at 4.07 and standard deviation at 0.72. From the structural embedded-ness the two elements that had the highest score is regarding to the questions that if the company had a broader relationship will benefits the company from the variety of knowledge that gain ($M = 4.22$ and $S = 0.65$). And if the broader relationship will give benefits from the opportunity awareness ($M = 4.28$ and $SD = 0.57$). The results of embedded-ness factor descriptive analysis are shown in Table IV.

TABLE IV
DESCRIPTIVE ANALYSIS OF EMBEDDED-NESS FACTOR

No.	Item	Mean	SD
	Relational embedded-ness	4.15	0.75
1.	The quality of firm relation increases the company adaptation ability with environment.	4.11	0.84
2.	The quality of firm relation increases the willingness to get other company to involve in knowledge transfer.	4.05	0.88
3.	The quality of firm relation increases the possibility to bring capital investment for company.	4.05	0.64
4.	The quality of firm relation will increase new opportunity creation.	4.33	0.68
	Structural embedded-ness	4.07	0.72
5.	The broader firm relation gives benefits for company establishment.	3.89	0.68
6.	The broader firm relation is positively affecting the new knowledge creation.	4.16	0.86
7.	The broader firm relations will increase the company variety of knowledge.	4.22	0.65
8.	The broader firm relations will increase the opportunity awareness.	4.28	0.57
9.	The broader firm relations will reduce the resistance to entering the industry.	3.83	0.85

The descriptive analysis for externalities factor depict the effects of specialization and local demand to the entrepreneurship. As the other questions, five-point Likert scale was used to measure externalities factor to the entrepreneurship. As been stated, the externalities factor is divided into specialization in the first six questions and demand effect on the last five questions. The mean score of the specialization is 3.95 and standard deviation at 0.81. Among the six elements of specialization the highest mean score ($M = 4.38$ and $SD = 0.61$) come from the question that if the

specialized technology knowledge would lower the entry barrier and whether the specialized supporting industries (complementary industries) would help the innovation process ($M = 4.16$ and $SD = 0.86$). The lowest elements come from the questions if the specialized institutions could give the specialized labor supply for company ($M = 3.22$ and $SD = 1.16$) and if the converge of specialized knowledge would bring the knowledge spill over. The demand effects factor looking into the customer demand elements to the entrepreneurship inside the cluster. Which overall mean score point at 3.85 and standard deviation at 1.07. The highest mean score is come from the question regarding to the effect of local demand pressure to the companies innovation process ($M = 4.16$ and $SD = 0.86$). The lowest mean score come from the question by having the customer closed by the company would gain benefit from the flow of information would become easier ($M = 3.55$ and $SD = 1.15$). The results of externality factor descriptive analysis are shown in Table V.

TABLE V
DESCRIPTIVE ANALYSIS OF EXTERNALITIES FACTOR

No.	Item	Mean	SD
	Specialization	3.95	0.81
1.	The specialized institution gives positive effect the skilled labors supply.	3.22	1.16
2.	Specialized skilled labor is positively affecting the knowledge transfer.	3.94	0.72
3.	Availability of specialized technology knowledge would lower the entry barrier.	4.38	0.61
4.	Availability of specialized supporting industries would lower the entry barrier	4.05	0.72
5.	Specialized supporting industries provide inputs for companies to innovate.	4.16	0.86
6.	Converge of specialized knowledge had the positive effects to knowledge spillovers.	3.89	0.96
	Demand Effects	3.85	1.07
7.	Customer proximity will lower the searching cost.	3.61	0.98
8.	Local customer demands stimulate the companies to innovate.	4.16	1.04
9.	The proximity of customer will lower the transportation cost.	4.11	1.18
10.	The proximity of customers will make the flow of information easier.	3.55	1.15

As the result from the questionnaire, regarding to the entrepreneurship factors relating to the industrial cluster effects, could be seen that regarding to the three main factors been suggested, respondents have a high point in entrepreneurship regarding to the firm relation (relational embedded-ness) with the mean of 4.22 second highest point regarding to the locational advantages of the company. Table VI shows the descriptive analysis of entrepreneurship factor in this study.

TABLE VI
DESCRIPTIVE ANALYSIS OF ENTREPRENEURSHIP FACTOR

No.	Item	Mean	SD
1.	It is more difficult for a company to establish a company in low price competition environment.	3.78	0.88
2.	The quality of firm relation gives benefits to company establishment.	4.22	0.73
3.	The proximity of the customers is good for company establishment.	3.78	1.11

Based on the theory, the model of framework is created in AMOS 17.0 with purpose to assess the hypothesis. Before look through the estimated numbers, several test should be done to identify whether the created model is fit enough to proposed the theory including chi-square test, RMSEA (Root Mean Square Error of Approximation), GFI, AGFI, CFI (Comparative Fit index), and NFI (Normed Fit Index).

First fit test index is chi-square test, fit number for chi-square test is lower than 3.00 and the model show the number 2.44 is show that the model is pass through chi-square test. Based on [18] NFI value for fit model should between 0.90 and 0.95, above 0.95 is assume as good fit model and below 0.90 is poor fit model. In study model show the number of NFI is a little above the minimum requirement for NFI (0.91). RMSEA currently could be said as the most popular measurement for model fit. Reference [20] categorizes the model fit into three categorize 0.01, 0.05, and 0.08. The number around 0.01 indicates excellent, 0.05 is good and 0.08 is mediocre fit. For RMSEA test the model in the study show the number 0.080 which show the model is mediocre fit. The CFI test for this model show the number exceeding 0.9 (0.93) which show that the model is pass the fit test for CFI. GFI and AGFI were affected by the number of sampler, the accepted number for fit test in GFI and AGFI both is above 0.80. In our studies the GFI is barely pass the number in 0.808 and AGFI slightly below the criteria requirement 0.770. Summarized for this model fit test could be seen in Table VII.

TABLE VII
RESEARCH MODEL FIT TEST

Goodness-of-fit measures	Recommended value	Model statistics
GFI (Goodness-of-Index)	≥ 0.80	0.808 *
RMSEA (Root Mean Square Error of Approximation)	≤ 0.1	0.080 *
NFI (Normalized Fit Index)	≥ 0.90	0.91 *
CFI (Comparative Fit Index)	≥ 0.90	0.93 *
Normed Chi-Square	≤ 3	

Confirmatory Factor Analysis (CFA) a commonly used to test whether measures of a construct are consistent with a researcher's understanding to the nature of the construct (factor). In which CFA test out whether the data could fit a hypothesized measurement model based on the theory. CFA itself similar to EFA but not the same, when EFA is conducted without knowing how many factors is exist or which variables belong with which construct, in CFA the researchers run the data using the defined pattern. This means with CFA, scholars need to identify the number of factors and which factor in each variable will load on. In other words, CFA specifies how measured variables logically and systematically represent the construct (the relationships which suggest how the variables could represent the latent construct). Fig. 2 shows the CFA create in AMOS using the gathered data, and showing that all the variables are suitable in each factor (factor loading above 0.50). Below we also run a model fit test to know whether the CFA model is suitable with the data been gathered.

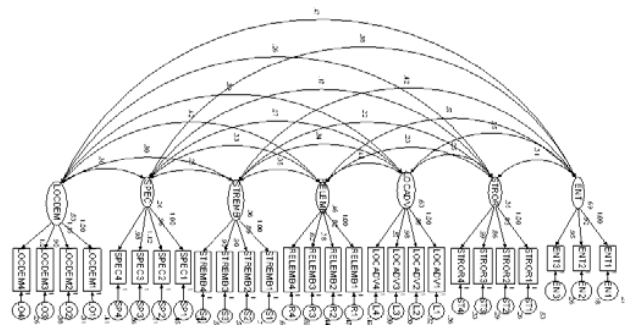


Fig. 2 Confirmatory Factor Analysis

Reliability test was conducted in purposed to know the reliability of each variable. The Cronbach's Alpha construction is shown below in Table VIII. From this table we could see that all the question for the constructs were valid as the Cronbach's Alpha value is higher than 0.7. Even though there is no absolute standardization in determining the coefficient number has the most excellent reliability, [21] suggests reliability values should be over 0.7 to be considered as reliable. Table VIII shows the Cronbach's alpha values in this study.

TABLE VIII
CRONBACH'S ALPHA VALUES

Constructs	Cronbach's Alpha
Entrepreneurship	0.831
Strategy Orientation	0.738
Local Advantages	0.869
Structural Embedded-ness	0.682
Relational Embedded-ness	0.712
Specialization	0.689
Local Demand	0.856
Overall	0.940

As the model is significantly fit with the data and proposed theory, now we can see if the hypothesis been argued is statistically supported. Taking forth to the hypothesis been argued, Hypothesis 1a is partially supported as $\gamma = 0.20$ and $P < 0.05$. Hypothesis 1b related to the locational advantages is strongly supported as $\gamma = 0.31$ and $P < 0.001$. Fig. 3 shows the AMOS Model in this study.

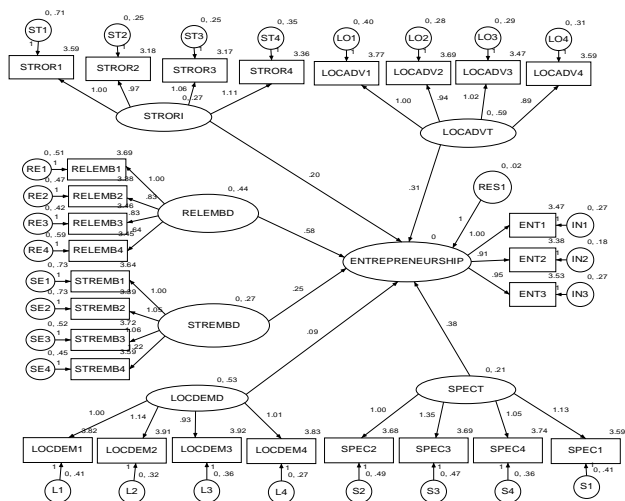


Fig. 3 AMOS Model

Hypothesis 2a and 2b regarding to the embedded-ness, relational embedded-ness (H2a) is strongly supported with $\gamma = 0.58$ and $P < 0.001$, as for structural embedded-ness (H2b) is partially supported with $\gamma = 0.25$ and $P < 0.05$. In the bottom of the hypothesis, look into the externalities factors, specialization and local demand. Hypothesis 3a (local demand effect to entrepreneurship) is not supported ($\gamma = 0.09$ and $P > 0.05$) in contrary hypothesis 3b (specialization effect to entrepreneurship) is been supported ($\gamma = 0.38$ and $P < 0.05$). Simply the regression result could be seen in the Table IX.

TABLE IX
REGRESSION RESULTS

Hypothesis	Path Description	Path Coefficients	Supported
H1a	Strategy Orientation --> Entrepreneurship	0.20 (**)	YES
H1b	Local Advantages --> Entrepreneurship	0.31 (***)	YES
H2a	Relational Embedded-ness --> Entrepreneurship	0.58 (***)	YES
H2b	Structural Embedded-ness --> Entrepreneurship	0.25 (**)	YES
H3a	Local Demand --> Entrepreneurship	0.09	NO
H3b	Specialization --> Entrepreneurship	0.38 (***)	YES

V. CONCLUSION

This study finds that the companies in Taichung machinery industrial district disagree with the high demand for company's products in the closed area of the company. The reason for this is because that Taiwan's market is not big enough and most companies export their products to foreign markets. Reference [22] states that Taiwan's machine tool industry distributes the products in a global market, such as US, Europe, China and South-East Asia. Also, based on Taiwan Association of Machinery Industry (TAMI) shows that in 2010, Taiwan sold 70.4% of total machinery production to the foreign market and only 29.6% demand come from local market. The similar reason for the unsupported hypothesis 3a ($\gamma = 0.122$ and $P >$

0.05) shows that local demand has a positive effect on the entrepreneurship. This study further finds that the most significant factor affecting the entrepreneurship inside the cluster is the relational embedded-ness of the companies inside the cluster. Based on the AMOS result with $\gamma = 0.721$ and $P < 0.05$, it shows that the relational embedded-ness inside the cluster helps the company establish an enterprise and sustain their business. This explains that the relational embedded-ness helps the new company to close the gap between companies, assists the flow of information (which effecting the creation, invention of new opportunity), and identifies social resources. Therefore it is obvious that the quality of inter-firm relation supporting to the new venture creation, regarding to the factors from relational embedded-ness in the cluster in new venture creation (entrepreneurship) and affecting the adaptation ability of company ($\gamma=0.681$) increases the possibility of the capital investment to the company ($\gamma=0.645$), the willingness to get other company to involve in knowledge transfer ($\gamma=0.627$) and the new opportunities creation ($\gamma=0.483$) of business. Although the relational embedded-ness helps the creation of companies ($\gamma = 0.237$ and $P < 0.05$), the structural embedded-ness does not provide a significant impact on the company creation as the relational embedded-ness. Based on the importance of the relation (relational embedded-ness), people usually consider to have a "secret-trade" or information sharing with private partners rather than with the public partners (structured embedded-ness).

This study uses three factors (competition, embedded-ness and externalities and finds that relational embedded-ness plays an important factor for company's establishment in a cluster, and the other two factors contribute more to the entrepreneurship. As the competition sub factors that consist of company strategy orientation and the locational advantages, in the study found out that in choosing the company strategy although the competitors in the same cluster would give an effect to the strategy moves been chosen but in here, we found out that no matter which strategy is chosen by the other competitors, the company should differentiated themselves by focus on the innovation rather than to competing on the low price products. The advantages provided to the companies in cluster although seem static (such as, the infrastructure) would perceived differently by the one and others companies. The reason is because of the different in needs by the companies itself and the awareness of this availability.

Industrial cluster consist of many components (suppliers, customers, competitors and complement industries), the relation (network) of the company to the other components would play an important factor. As in this study, we found out that company relationally embedded is the most important factor that been provided to the entrepreneurship. By having the closed relation with the other components, the company could gain the benefits such as lowering the deterrence when first establish a company and connect with the other companies in the knowledge sharing. Also the manager should focus on deepen the quality of the relation between the components (relationally) rather than had the shallow broad relation (structurally).

Availability that provided from the cluster to the companies inside the cluster would be a mass, and from this study that specialization (in way of labor skill, key material, etc.) is proved significantly effecting the entrepreneurship inside the cluster but for the demand effect in this case (in study of Taichung machinery cluster) was not proved had an effect to entrepreneurship. Industrial cluster itself supposedly had their own characteristic which would differ themselves from the other clusters. The company should consider what characteristic a cluster would have and use this advantage to help them build companies and thinking a round way back to hinder the scarcity.

In talk about a regional phenomenon kind of study, such as industrial cluster, taking the general theory into a particular certain regional area would come out with some errors. As in this study, from the prior study of industrial cluster and entrepreneurship many authors believe that local demands as the feature from industrial cluster have positive effect to entrepreneurship. But for Taiwan case, where the local demand for machinery industry is lower than foreign market demand along with the focus market for TMC is export oriented, this theory could not be applied. Meet with this kind of error mistakes, crossed in mind that will be better if in developing a research model from the generalized theory can be specialized into the case study where the theory would be applied. Next, regarding to the questionnaire responds, because of the respondent vary in job position (percentage of the respondents positions, 39% respondents are in the staff position, about 61% on higher position from manager level to the CEO and contributes in strategic planning), might have some responds were based on finite knowledge on their industry, although when looking through the other variables such as job experiences (40% respondents have job experience in more than 10 years, 29% are around 6 to 10 years experiences and 30% are below 6 years experiences) the responds could be trusted but would be more significant if there were some interviews been done in clearly explain the answers of the respondents.

Since industrial cluster first introduced by [8], many scholars have been studying for this phenomena on each different places resulting in many different hypothesis and arguments. In this study, we try to take the Taichung machinery cluster as the study for the effects of the cluster to the entrepreneurship. Based on the prior studies on similar topic, argued three factors from the cluster that believed have effects the entrepreneurship (competition, relationship and external factor).

Using the SEM tools AMOS to design the model and testing the hypothesis, which come out with some different result from which predicted before. Although the competition and embedded-ness factor are supported but for local demand sub factor is not supported. Searching for the reasons for this results we concluded that first, in different cluster would had the specialized characteristic that would differ one cluster from the others. An effect / factor inside a cluster would not always available on the other cluster. Besides for the main criterion for the cluster such as, firm inter-relation or specialized industrial components. Second, for the entrepreneurship or creation of

new venture innovation and the supported factor like knowledge sharing believed hold the important factor. In the study, companies as the respondent when establishing a company believed that differentiated their companies in any competition condition and their interrelation with the other components to support their information transfer and knowledge creation as the important factors. Third, in the research where the factors would come out very broad suggested the researcher would first do the interview to verify the suggested factors and simplify or more focus the research on a small portion of the broad idea. Considering the limitation of this study, on the next similar study should considering some aspect that would come out with different and better research result.

REFERENCES

- [1] Schumpeter, J.A. (1965). *Economic Theory and Entrepreneurial History*. In: Aitken HG (ed) *Explorations in enterprise*. Harvard University Press, Cambridge, MA
- [2] Fransman, M. (1986). "International competitiveness, technical change and the state: The machine tool industry in Taiwan and Japan," *World Development*, 14(12), 1375-1396.
- [3] Covin, J. G. and Slevin, D. P., 1991. *A Conceptual Model Of Entrepreneurship as Firm Behavior*.
- [4] Zahra, S.A., 1993. *A Conceptual Model of Entrepreneurship as Firm Behavior*.
- [5] Audretsch, D. B. and Lehmann, E. E. (2005) "Entrepreneurial Access and Absorption of Knowledge Spillovers: Strategic Board and Managerial Composition for Competitive Advantage," *CEPR Discussion Papers* 5335, C.E.P.R.
- [6] Eckhardt, J.T. and Shane, S.S., 2003. *Opportunities and Entrepreneurship*. *Journal of Management* 29(3), 333-349.
- [7] Miller, D. (1983), "The correlates of entrepreneurship in three types of firm," *Management Science*, 29, 770-791.
- [8] Porter, M.E. (1990). *The Competitive Advantage of Nations*. Macmillan: London.
- [9] Rabbellotti, R. (1998) "Collective effects in Italian and Mexican footwear industrial clusters," *Small Business Economics*, 10(3), 243-262.
- [10] Sørensen, J.B. and Sorenson, O.(2003), "From Conception to Birth: Opportunity Perception and Resource Mobilization in Entrepreneurship," *Advances in Strategic Management*, 20, 89-117.
- [11] Sorenson, O. and Audia, P.G. (2000), "The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States," *American Journal of Sociology*, 106, 424-462.
- [12] Gartner, W.B.,1985. *A Conceptual Framework for Describing the Phenomenon of New Venture Creation*. *The Academy of Management Review*, Vol. 10, No. 4, 696-706.
- [13] Canina, L., Enz, C.A. and Harrison, J.S. (2005), "Agglomeration effects and strategic orientation: Evidence from the US lodging industry," *Academy of Management Journal*, 48(4), 565-581.
- [14] Uzzi, B. and Gillespie, J.J., 2002. *Knowledge Spillover In Corporate Financing Networks: Embedded-ness and The Firm's Debt Performance*. *Strategic Management Journal*, 23, 595-618.
- [15] Dayasindhu, N., 2002. *Embeddedness, knowledge transfer, industry clusters and global competitiveness: a case study of the Indian software industry*. *Technovation* 22, 551-560.
- [16] Rajneesh, N. and Santangelo, G.D. (2011), "New insights on the role of location advantages in international innovation," *MERIT Working Papers* 045, United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT).
- [17] Krugman, K.(1991), "What's new about the new economic geography?" *Oxford Review of Economic Policy*, 14(2), 7-17.
- [18] Bentler, P.M. and Bonnet, D.C. (1980), "Significance Tests and Goodness of Fit in the Analysis of Covariance Structure," *Psychological Bulletin*, 88(3), 588-606.
- [19] Phelps, N.A., 1992. *External Economies, Agglomeration and Flexible Accumulation*. *Transactions of the Institute of British Geographers, New Series*, 17(1),35-46

- [20] MacCallum, R.C., Browne, M.W. and Sugawara, H. M. (1996), "Power analysis and determination of sample size for covariance structure modeling," *Psychological Methods*, 1(2),130-149.
- [21] Nunnally, J. C. (1978). *Psychometric theory* (2nded.). New York: McGraw-Hill.
- [22] Brookfield, J.,2003. *Firm Strategy, Organizational Structure and Industrial Districts: A Study of Taiwan's Machine Tool Industry*.