Expanded Model of Triple Helix-Based Development to Increase Competitiveness of Small Industry in Kecamatan Waru Sidoarjo

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ABSTRACT

The objective of the research is to bring about expanded model of triple helix-based development or improvement in order to build up the competitiveness of small industry. Focus of small industry development and expansion via optimal level of synergetic role between the stakeholders of small industry, academician, and government in digging local potency. The local potency is meant as all potencies which have economic values, comprises: (i) potency of human resources, and (ii) potency of economic resources developed for fulfill continual subsistence of the people. Determination of small industry area is based on a unit of potency which has specification of mutually-supporting potencies of resources, has geographical dependence and closeness. Specific target to be achieved: first, structured profile of the area and small industries containing regional characteristic, business sector, superior commodity and industrial potency that can be developed by community. Second, design of expanded model of triple helix-based development and third, program and activity related to the expansion of small industrial area. To achieve the goals, the method of research is designed by using descriptive method of research, policy research and applied research. The first year research, analytical method used to assess efficiency of business sector uses Data Envelopment Analysis (DEA) and FGD to set expanded model of small industrial development based on triple helix. Second year, standardization of the model by way of trial and error and implementation of the model to target group followed by monitoring and evaluating and FGD to find standard model.

Keywords: Triple Helix, development, small industry

INTRODUCTION

Developmental strategy directed to expand small industry has to be capable of identifying the problems dealt with and the alternative solution, and driving economic growth. This activity works if it is supported by adequate policy via formulation and application of strategies carried out by governmental agencies, businessmen, universities, and local community transformed into innovative activities.

The economic and developmental policy can drive local small industries and community to anticipate market demand and global change. Important issues in increasing the competitiveness of small industry are to carry out development of managerial skill or competence and adequate and continual fulfillment of technology for industrialists, so they can access the market, information, finance, and management. Economic expansion means to increase innovation and invention by whatever way that can relate strategy of technological

375
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transfer and entrepreneurship skill from local to global by empowering individuals of businessman.

One of formats of small industry expansion based on triple helix is to synergize the role of stakeholders consisting of industrialist, academician, and government. The fundamental assumption of small industrialists is that businessmen have limitation of competence to seek business opportunities, so that it is required an effort to mediate and facilitate those businessmen via process of participation, consultation, facilitation and counseling in the activity of incubation. Transfer of knowledge and technology via triple-helix synergistic process is a process of synergism of stakeholder roles which bridges the process of technological transfer is aimed to give advantage for process of development and competitiveness of small industry through the series of activities enables readiness of small industrialists and 'business start-up' to be better from viewpoint of behavior and business institution.

STUDY OF LITERATURE

Every region has a pattern of economic growth that is different from other regions. Therefore, in planning the economic development of a region, firstly, it needs to recognize economic, social, and physical characters of the region, including the interaction with other regions. Comprehension about theory of economic growth is a determinant of quality of regional economic developmental planning (Darwanto, 2002).

Basic problem in developing regional economy is in focus on development policies based on regional character by utilizing the potency of human resources, institution, and physical resources locally. This orientation aims at initiatives arisen from the region in the process of development to create new job opportunity and stimulate the build-up of economic activity (Waluyo, 2007).

Every regional economic development has main objective to increase the number and variety of job opportunities to increase the welfare of the people (Kusreni, 2009). To achieve this, government and the regional people must take the initiative of regional development. Therefore, government and the people have to be capable of assessing the potency of resources needed for designing and building up regional economy.

Regional economic development needs to give short and long term solutions to regional economic issues and needs to fix the incorrect policy. It is part of the entire regional development. Therefore, in expanding regional economy is required to consider areal economy and formulate pro-business regional development (Darwanto, 2002).

Triple Helix: a Synergistic Model in Expanding Small Industry

Triple helix approach is as positive synergy between three different actors in discussing development of innovation introduced by Etzkowitz and Leydesdorff. Academicians in universities and research facilities with resources, science and technology seek to bring about various applicable inventions and innovations. Businessmen in industry do capitalization providing economic advantage and benefit for the people. The government guarantees and preserves stability of both relationships with conducive regulation (Etzkowitz and Leydesdorff, 2000).

This model as suggested by Taufik (2010) underlines that interaction between universities (academicians), industry and government is the key for building up the conducive condition for innovations. Irawati (2007) suggested the model involves universities as centre of excellence via academic activity based on research and development, industry as supplier of consumer demand based on commercial activity and research and development as well, and government as policy maker where integration of the three different actors will increase abundance of knowledge in an area and in turn build up the development of local and national economic competitiveness.

At least there are three forms of evolution of triple helix model:

a. Triple Helix I shows model etatistik of relations between university-industry-government, as illustrated in the Figure 1 as follows:
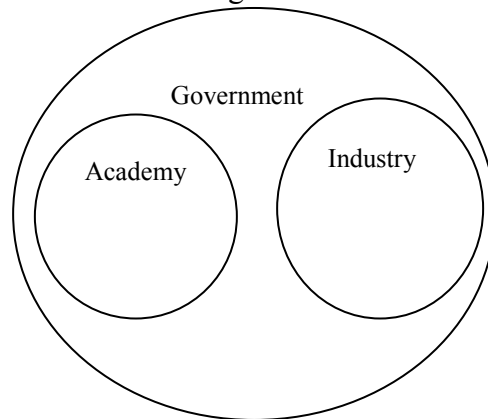
b. Triple Helix 2, as illustrated in Figure 2 is defined as a system of communication consisting of market operation, technological innovation that influences transformation in the future and interface control. Different functions of the interface operate in distributed modus for the three parties, where according to Etzkowitz and Leydesdorff as resulting in new forms of communication like continual technological transfer or in laws of patent.

Figure 2. Triple helix model II : Laizzes Faire Model
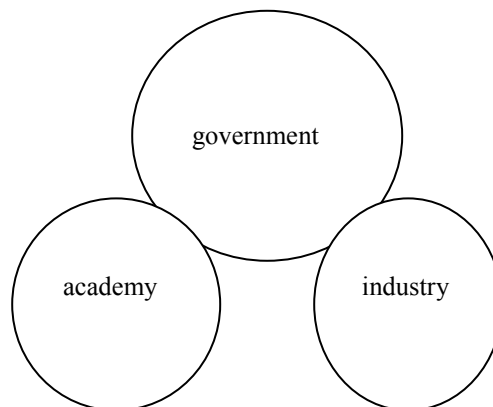
c. Triple Helix Model III, as illustrated in Figure III shows development of complex and dynamic pattern of partnership between the three main actors of the innovative system. The actors play roles in creating knowledge of infrastructure

in the form of overlapping spiral circle, where each circle takes the role of other party and in the interface develops hybrid organizations.

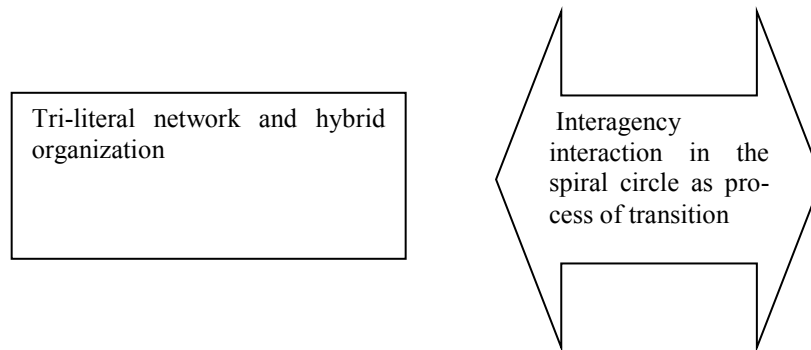| Tri-literal network and hybrid organization | Interagency interaction in the spiral circle as process of transition |

Figure 3. Triple Helix Model III : Model of Hybrid Organization

Martini et al, 2012 said that Triple helix model introduces three dimensions of social system, those are geography, economy, and science. The main actor who is responsible for dimension of geography is government who regulates territorial area, for dimension of science is academicians who create and distribute science inside the area, and the actor who is responsible for economic dimension is business entity who creates economic activity in the area. Interaction between the three dimensions will create infrastructure of science, political economy, and innovation as competitive advantage of the area and gives added value.

METHOD OF RESEARCH

The method is combination of descriptive researches, policy research and applied research to expand model of triple helix based development in order to increase competitiveness of small industry in Kecamatan Waru Sidoarjo. Analytical units in this research are 1) businessmen as reference of expanding the pattern of development of small industry; 2) community as the object of development of new entrepreneurship and 3) stakeholder as supporters of expansion of small industry in Kecamatan Waru Kabupaten Sidoarjo with frame of sample based on purposive sampling, that is the actors from each sector of PDRB donator.

To find out the correct plan of model of areal-based rural incubator, this research is divided into two phases of program; each phase is carried out for one year of budget. The phases of the research are:

1. To design model of triple-helix-based development to increase competitiveness of small industry based on regional characteristic, business sector, superior commodity and small industrialist characteristic.

2. Trial and error test and implementation model of triple helix based development to increase the competitiveness of small industry and stabilization of the model readily reported and disseminated.

Phase 1 (year 1) : Design of prototype model

Start phase 1

1. To identify various models of small industry growth developed by various government agencies, business, non-government organiza-tion, university and others in the location of research

2. To make design of activity and research instrument to find out data related to evaluative model of small industrial model, profile of local economic potency and characteristics of small industrialist

3. To collect primary data and documentation of secondary data and information relevant to design of model of triple helix based development to increase small industrial competitiveness

4. To handle and tabulation of research data, followed up with analysis of research data by using efficient sector of business

5. Opinion sharing via fgd with members, respon-dents, and related parties

6. Analysis and design of model of triple helix based counseling or development as basis for formation of prototype model, test-case and implementation of model to the next research

Finish phase 1

First model, identification and analysis of activity for the pattern of small industry development and stimulation of new entrepreneurship which had been done and other interrelated aspects, among other things: a) Identification and analysis of activity which had been done to develop small industry; b) Identification of requirement of small industry development and expansion; c) Analysis of behavior from every actor and stakeholder, motivation, and pattern of collaboration and organizing the activity of small industry development; d) Identification and analysis of policy, support of reinforcement, institutional and financial pattern, to foster small industry.

Second method is identification and analysis of economic profile of industrial area in order to find out economic potency of industrial area and contribution from each sector in PDRB. Assessment of efficiency of business unit as a foundation of small industry is based on some criteria: 1) existing number of units; 2) amount of credit granted to each business sector to see added investment; 3) number of employed workers; 4) added value from business sector and 5) contribution of business sector to PDRB.

To measure efficiency of small industry development, it will be used analytical tool DEA (Data Envelopment Analysis) consisting of input and output variables and formulated in two assumptions, those are CRS (Constant Return to scale) and VRS (Variable return to scale). In this research, the assumption CSR is used since by considering data used is final data for every year, possible changes have been made in the one year. DEA is used to measure the efficiency of a unit of economic activity (business sector). There are three advantages from the measurement with DEA:

a. As a benchmark to find relative efficiency for facilitating existing economic inter-unit comparison.

b. To measure variations of efficiency of economic inter-units to identify determinant variable of efficiency.

c. To determine implication of policy so that it can increase the efficiency.

Model in this research is developed by Miller and Noulas (1996). Technical efficiency in the model of business expansion is by counting ratio between input and output with business

expansion. DEA will count business expansion that uses input n to produce output m. The analytical tool is formulated as follows:

$$h_s = \sum_{i=1}^{m} u_i\, y_{is} \Big/ \sum_{j=1}^{n} v_j\, x_{js} \qquad \ldots\ldots\ldots\ldots\ldots (1)$$

Where

> Hs = is the model of technical efficiency of regional business expansion s, in this case is business sector

> Ys = is quantity of output I produced by sector s

> Xjs = is quantity of input j utilized in the expansion of business s

> Ui = is weight of output I produced by business sector s

> Vj = is weight of input j provided by business sector s and i is counted from l to m and j is counted from l to n.

The equation above shows usage of one input variable and one output variable. Ratio of efficiency (hs), then is made maximally with constraint as follows:

> Where n shows number of business sector. First non-equation shows inefficiency of other business sector no more than l, while second non-equation has positive weight. Ratio will vary between 0 and 1. Business expansion in each sector is efficient if it has ratio approaches 0 indicates lower and lower in efficiency in business sector (Miller and Noulas, 1996). In DEA, every business sector can specify the weight and ensure that the selected weight will result in the best measurement.

$$\sum_{i=1}^{m} u_i\, y_{ir} \Big/ \sum_{j=1}^{n} v_j\, x_{jr} \leq 1 \text{ for } r = 1\ldots.,N \qquad \ldots\ldots\ldots\ldots\ldots (2)$$

Third Method, based on analytical result from usage of DEA method, it is discovered that which business sector is efficient related to business development. Inefficient business sector is discovered as well including the place or variable resulting in the inefficiency. Next is process of in-depth interview with sample of businessmen from sector of efficient and inefficient business. In-depth interview aims to deepen and discover the source of problem. Then focus group discussion (FGD) to look for alternative solution. The FGD is expected to be capable of providing input in formulating policy and action of expanded prototype model of small industry development with characteristic of local potency to strengthen competitiveness of small industry.

RESULT OF POTENCY OF RESEARCH OBJECT

General Representation of Kecamatan Waru

Kecamatan Waru is a sub-district in Sidoarjo, East Java, Indonesia. This sub-district borders on Surabaya, and in this sub-district there is a bus station Purabaya, the biggest bus station in

Indonesia. Waru is also one of the main industrial areas in south of Surabaya. Many small industrial centers here.

Waru is also known as center of buffer industry from Surabaya, and many important industries previously center on this sub-district, such as Pabrik Paku, Pabrik Susu Nestle, Perusahaan Biskuit UBM and Pabrik Soda.

Administrative Zone

Kecamatan Waru is a border between south Sidoarjo with Surabaya and is a region experiences rapid development. In Addition to its strategic location, with various potencies such as sectors of industry, trade, and small and middle business and supportive and adequate human resources, the Kecamatan waru becomes one of strategic regions for expansion of economy.

Potency of Human Resources

Population in Kecamatan Waru reaches 223.697 people, consists of 112.094 males, and 111.603 females, with sex ratio is 100,44%. Human resources cannot be separated from educational level. The existing KGs in Kecamatan Waru are 109 units with teachers as many as 856 people, students of KGs are 7.161. According to data from BPS in 2012, numbers of ES, JHS, and SHS, private or public, existing number of students and teachers in Kecamatan Waru is presented in Table 2.

Table 2. Numbers of private and public schools, students, teachers

	Public elementary school (ES)	*Private ES and MI*
Number of school	24	34
Number of teacher	534	607
Number of students	11.942	10.948
	Public junior high school (JHS)	Private JHS and MTs
Number of school	4	19
Number of teacher	212	503
Number of student	3307	6060
	Public senior high school (SHS)	Private SHS
Number of school	1	19
Number of teacher	59	353
Number of student	975	3008

Potency of Natural Resources

Potency of Agriculture and Fishery

Potency of natural resources in Kecamatan waru cannot be separated from landscapes, one of them is rice field and fishpond. Detailed width of rice field and fishpond in Kecamatan Waru is presented in the following table:

Table 3.Width of rice field and fishpond in Kecamatan Waru

No.	villages	Width of rice field (HA)	Width of fish-pond (HA)	Total
1.	Madaeng	15.00	128.10	143.10
2.	Pepeligi	18.00	204.17	222.17
3	Waru	11.00	101.46	112.46
4.	Kureksari	-	122.96	122.96
5.	Ngingas	-	200,45	200,45
6.	Tropodo	-	169.68	169.68
7	Tambak sawah	10.00	208.29	218.29

From data above, it can be seen the potency of fishery is bigger than agricultural activity in kecamatan waru. Mainland in kecamatan waru is mostly used for dwelling, offices, and business activity. Production of land fishery and fishpond in year 2012 is presented in the table 4.

Table 4. Production of land fishery and fishpond in year 2012

Commodity	Total of production (kg)
	Fishpond and beach
Udang windu	111.76
Ikan bandeng	569.950
Kepiting	2.960

Productive output of fishpond and land fishery in kecamatan waru in 2012

Potency of animal husbandry

The existing cattle in kecamatan waru consists of several varieties, those are little cattle consisting of goat and sheep, big cattle consisting of horse, cow poting, and milk cow, and poultry consisting of non-ras chicken, duck.. Detailed data of productive output in 2012 is presented.

CONCLUSION

Based on the result obtained in the research, it is found that Kecamatan Waru, Sidoarjo has quite big potencies of resources. The potencies comprise:

Potency of human resources in kecamatan waru varies greatly in educational background and profession, but gives positive contribution to economic development, especially small industry capable of creating job opportunities and new entrepreneurship in kecamatan waru.

Potency of economic resources, those are business activities, small, middle, big industries. Industrial activity can absorb workers relatively high. According to the main objective of the

research, i.e. to develop the model of small industry empowerment based on triple helix (small industrialist, academician and government) in order to increase competitiveness of small industry in kecamatan waru, the result indicates that improvement of small industry development and handicraft in kecamatan waru can be carried out.

From study of documentation in the form of governmental policy of Sidoarjo, there is vision and mission of pemerintah kabupaten Sidoarjo in 2010-2015 are "Sidoarjo is prosperous, independent, and fair", outlined into eight main missions:

1. To increase quality of human resources to realize people who have competitiveness to deal with global challenge

2. To foster potencies of sectors of industry, trade, tourism, agriculture, fishery, UMKM, cooperation optimally which have concept of environment to increase people living standard

3. To increase social order of living which has personality, faithful, and can preserve peace and order

4. To encourage people participation in the continual development with principle of social development and equality of gender

5. To increase professionalism of apparatuses to achieve prima service

6. To encourage development of investment climate to reach social welfare and prosperity

7. To increase quality and preservation of living environment

8. To grow healthy and polite democratic climate, and uphold social norm and ethics

9. Second point from the outline is in accordance with the objective of this research, i.e.

To foster potencies of sectors of industry, trade, tourism, agriculture, fishery, UMKM, cooperation optimally which have concepts of environment to increase people living standard. With concept of triple helix (BIG) involving government, businessmen, small industrialists and academicians it is expected that they can carry out improvement to the small industry, so that it can increase the competitiveness.

ACKNOWLEDGEMENTS

REFERENCES

[1]. Fajar, A. N. (1996). *The Business Talent and Indonesian Entrepreneurs Personality*. Fourth Asia Pacific Conference on Giftedness. Hotel Horison, Jakarta.

[2]. _____ (2001). *Model Pengembangan Kewirausahaan di Indonesia dan Survei Kewirausahaan Indonesia*. Seminar Kewirausahaan, Jakarta.

[3]. APEC, (2002) *The New Economy in Apec: Innovations, Digital Divide and Policy*, Singapore.

[4]. *BPS (2013). Kabupaten Sidoarjo dalam Angka Tahun 2013.* BPS Kabupaten Sidoarjo.

[5]. *BPS (2013). Kecamatan Waru dalam Angka tahun 2013.* BPS Kabupaten Sidoarjo.

[6]. Departemen Koperasi dan PPK, (1994). *Buku Pedoman Manajemen Sederhana Usaha Kecil.* Departemen Koperasi dan PPK.

[7]. Business Innovation Center of Indonesia**,** (2002). Bunga Rampai, <u>*Lembaga Keuangan Mikro*</u>, Bekerjasama dengan Kontor Menegkop dan UMKM, 2002;

[8]. Carland, J. W., & Carland, J. A. (1992). "Managers, Small Business Owners, Entrepreneurs: The Cognitive Dimention". *Journal of Business and Entrepreneurship, 9.* Nort Carolina.

[9]. Carland, J.W., et al. (1988). "Who is an Entrepreneur? Is a Question Worth Asking". *American Journal of Small Business, 12*(4), spring.

[10]. Carland, J.W., et al. (1988). "Distinctions between Entrepreneurial and Small Business Ventures". *International Journal of Management, 5*(1), March.

[11]. Cohen (1990). *Entrepreneurship and Small Business Problem Solving*, 2nd ed., Singapore: John Willey & Sons.

[12]. *Darwanto, Herry, (2002). Prinsip Dasar Pembangunan Ekonomi Daerah, Jakarta.*

[13]. *Etzkowitz, H., & dan Leydesdorff, L. (2000). The Dynamics of Innovation: From National Systems and 'Mode 2' to a Triple Helix of University-Industry-Government Relations. Research Policy, 29*(2).

[14]. Gnyawali, D. R., & Danierl S. F.(1994). *Environtment for Entrepreneurship Development: Key, Dimensions and Research Implication, Entreneuarship: Theory and Practice 18*(4).

[15]. Gray, C. (2002). Entrepreneurship Resistance to Change and Growth in Small Firm, *Emerald Journal of Small Business and Enterprise Development*, *9(*1).

[16]. Harvie, C. (2002). *Regional SMEs and Competition in the Wake of the Financial and Economic Crisis*, , International Coference on Impact of Crises on Trade, Regionalism and Globalisation in Asia and Australia, University of Wollongong, Australia, 5-6 July 2002.

[17]. Hendrawan, S., et. al.(1994). Pengembangan Industri Kecil di Indonesia :Pelajaran Analisa Dampak dari Jawa Tengah (Laporan Penelitian), *Prisma* No. 9 September 1994, LP3ES, Jakarta (Laporan Penelitian).

[18].   Irawati, D. (2007). *Understanding The Triple Helix Model from The Perspective of the Developing Country: A Demand or A Challange for Indonesian Case Study?. MPRA Paper no.5829,pp.1-16.*

[19].   James, A. (1988). "The Spirit of Entrepreneurship",   *Journal of Small Business Management, 26.*

[20].   Kaballu, O. U., & Daniel, D. K. (2001). Strategi Bertahan Usaha Kecil dalam menghadapi Krisis Ekonomi (Studi Industri Kecil Konveksi di Salatiga), *Jurnal Ekonomi dan Bisnis* : *Dian Ekonomi*, Vol VII no 2, September 2001.

[21].   Kao. (1989). *Entrepreneurship, Creativity & Organization: Text, Cases & Reading,* Englewood Cliffs: Prentice.

[22].   Kline, S., & Rosenberg, N. (1986). An Overiew of Innovation, in R. Landau and N. Rosenberg (eds.). *The positive Sum Strategy: Harnessing Technology for Economic Growth*. Washington, DC: National Academy Press.

[23].   *Kuncoro, M. (2010). Ekonomika Pembangunan: Masalah, Kebijakan, dan Politik, Edisi.5, Penerbit Erlangga, Jakarta.*

[24].   Kuratko & Hodgetts. (1989). *Entrepreneurship: A Contemporary Approach,* New York: The Dryden Press.

[25].   Kusreni, S. (2009). *"Pengaruh Perubahan Struktur Ekonomi terhadap Spesialisasi Sektoral dan Wilayah serta Struktur Penyerapan Tenaga Kerja Sektoral untuk Daerah Perkotaan di Jawa Timur", Majalah EKONOMI, Vol. XIX, No. 1:20-31.*

[26].   Martini, L., et al.. (2012). Triple Helix Collaboration to Develop Economic Corridors as Knowledge Hub in Indonesia. *Procedia - Social and Behavioral Sciences 52* (2012) 130 –139.

[27].   Mulyanto, D/ (2006). *Usaha Kecil dan Persoalannya di Indonesia*, Cetakan Pertama, Yayasan AKATIGA, Bandung.

[28].   Soetrisno, N. (2002). *Pembangunan Ekonomi Berkeadilan Sosial, dalam Media Pengkajian Koperasi Usaha Kecil dan Menengah (INFOKOP)*, Koperasi Menuju Otonomisasi dan Berdaya Saing: No. 20, hal, 17, 2002.

[29].   Soetrisno, N. (2003). "*Kewirausahaan Dalam Pengembangan UMKM di Indonesia". Ekonomi Kerakyatan Dalam Kancah Globalisasi*. Deputi Bidang Pengkajian Sumberdaya UMKMK.

[30].   Strauss, A., & Dan, J. C. (1990). *Basics of Qualitative Research*: Grounded Theory Procedures and Technique, California: Sage Publication.

[31].   Sukardi, (2004). *Pendekatan Diagnostik Case Study dalam mendisain Kebijakan Pembinaan Industri Kecil Di Kawasan Indonesia Timur*, Jurnal Kebijakan Publik: Publisia, Volume 8, Nomor 3, Desember 2004.

[32].   Takyi-Asiedu, S.(1993). "Economic Policy: Economic Development, Entrepreneurs, Capitalism, Social Change, Problems, and Aplications", *Journal of Business Venturing, 8.*

[33]. *Taufik, T. A.(2010). Kemitraan dalam Pengusatan Sistem Inovasi Nasional, Dewan Riset nasional, Jakarta.*

[34]. Timmons, S., & Dingee, (1985). *New Venture Creation: A Guide to Entrepreneurship*, 2nd ed, Homewood: Richard D. Irwin.

[35]. UNTAD, *Improving the Competitiveness of SMEs in Developing Countries: The Role of Finance to Enhance Enterprise Development*, UNTAD, Geneva, (2001).

[36]. Urata, S. *(2000). Policy Recommendation for SME Promotion in The Republic Indonesia.* Jakarta: Japan International Agency.

[37]. Vesper (2002). *New Venture Strategies.* Englewood Cliffs: Prentice Hall.

[38]. Waluyo, J.(2007). *Fiscal Decentralization: Dampak Desentralisasi Fiskal Terhadap Pertumbuhan Ekonomi dan Ketimpangan Pendapatan Antardaerah di Indonesia, Makalah Pusat Studi Ekonomi Fakultas Ekonomi Universitas Indonesia, download tanggal 10 Juni 2014.*

[39]. Willinger, M., & Zuscovitch, E. (1988). *Towards the Economics of Information Intensive Production Systems: The Case of Advanced Materials*, in G. Dosi et al. (eds.). Technical Change and Economic Theory. New York: Frances Pinter.