

Moderating Effect of Demographic Factors and Entrepreneurial Phase on the Relationship between Entrepreneurial Competencies and Innovation of ASEAN Entrepreneurs

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ABSTRACT

This paper focuses on the relationship between entrepreneurs' competencies and innovation arguing that age and education play an important role in moderating this relationship. Data on entrepreneurial activities was analysed using Global Entrepreneurship Monitor – GEM framework. The GEM model identifies key elements of the relationship and interaction between entrepreneurship and economic growth. It defines entrepreneurship as consisting of three main components: entrepreneurial framework conditions, entrepreneurial competencies and aspirations, and the phase of entrepreneurial activities. This study uses the 2013 individual level data of ASEAN countries in the GEM consortium. Using multiple regression modelling, research findings indicate that competencies enhance innovation, higher education reduces innovation, early entrepreneurs are more innovative than established business owners, and young entrepreneurs are generally more innovative, but the interaction between age and competency would lead to stronger innovation.

Keywords: Entrepreneurial competency, entrepreneurial phase, GEM model, innovation, regression model

INTRODUCTION

Innovation refers to introducing a new idea in the product (services) and market. Governments adopt entrepreneurship and innovation as key drivers in achieving the wealth of the people because they create new business opportunities and new jobs. Koellinger (2008) raises a challenging question “*Why are some entrepreneurs more innovative than others?*” His hypotheses

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indicated entrepreneurial competency, the phase of entrepreneurship activity, and also the age of entrepreneurs affect innovation. Hyvärinen (1990) states that innovation could be affected by an environment, and that changes in the environment create possibilities for innovation. The environment is either a direct or general condition which influences the innovativeness of the business. A direct environment consists of markets, consumer attitudes, and so on. The general environment includes technology and education.

The Southeast Asian region is strategic and fast economic growth region, as indicated by human development index, age dependency ratio, and life expectancy ratio. A regional study of entrepreneurship in Asean revealed some key figures, such as a positive societal attitude towards entrepreneurship and on average, two-thirds of people in the region consider becoming an entrepreneur as a good career choice, with moderate to high rate of entrepreneurship intention (Xavier, Guelich, Kew, Nawangpalupi, & Velasco, 2015).

However, there is a sharp falling-off among the active entrepreneurs, as shown in Table 1. In the case of Indonesia, early-stage entrepreneurship activity, known as total early-stage entrepreneurship activity, (TEA), amounts to 14.2% (weighted). After three and half years running, their business is considered an established business at a rate of 11.9%.

Among ASEAN countries, Indonesia has a high TEA rate, together with the Philippines, Thailand, and Vietnam. Table 2 shows a description of TEA by age and gender. Among ASEAN countries, the entrepreneurship rate is high at the age of 25-35 and 35-44, except for Malaysia (45-54). Women play a prominent role in the early entrepreneurship rate in Indonesia, Malaysia, the Philippines, and Vietnam.

These statistics indicate a potential entrepreneurship development in the region and have attracted policy makers in formulating strategies and policies for boosting the region's economic development. One indicator of a country's economic development is enterprise growth,

Table 1
Some key figures of entrepreneurship in the ASEAN region (% of adult population), GEM 2014

Country	Nascent entrepreneurship rate	New business ownership	Early-stage entrepreneurship activity – TEA	Established business rate	Discontinuation of businesses
Indonesia	4.4	10.1	14.2	11.9	4.2
Malaysia	1.4	4.6	5.9	8.5	2.0
Philippines	8.2	10.5	18.4	6.2	12.6
Singapore	6.4	4.8	11.0	2.9	2.4
Thailand	7.6	16.7	23.3	38.1	4.2
Vietnam	2.0	13.3	15.3	22.2	3.6
ASEAN	5.0	10.0	14.7	14.1	4.8

Sources: Xavier et al. (2015, p. 36)

Table 2
TEA rate by age and gender (% of adult population), GEM 2014

Country	Age (years)					Gender	
	18-24	25-35	35-44	45-54	55-64	Male	Female
Indonesia	9.8	16.7	15.8	14.4	10.0	13.2	15.2
Malaysia	3.9	7.7	5.5	8.3	2.3	5.1	6.8
Philippines	12.0	19.4	20.1	19.2	25.1	15.9	20.8
Singapore	10.3	13.4	14.1	8.4	7.4	14.8	7.2
Thailand	14.6	28.9	26.3	22.1	19.4	24.5	22.1
Vietnam	12.0	22.1	15.0	12.9	8.6	15.1	15.5
ASEAN	10.4	18.1	16.1	14.2	12.2	14.8	14.6

Sources: Xavier et al. (2015, p. 36)

and this becomes a focus in entrepreneurship research, with some aspects that affect entrepreneurs, such as competency, demographic factors, and innovation. Xavier et al. (2015) defined enterprise growth as expectation of generating jobs in the next annual periods. Table 3 shows the percentage of entrepreneurs of established business who expect to create jobs in the following five years. The result is not encouraging since the majority created no jobs, but at least the entrepreneur expects to create 1-5 jobs in the following five years.

Entrepreneurship and innovation have become key drivers that boost economic development of the country, as indicated by their competitiveness level (Carayannis, Samara, & Bakouros, 2015). Entrepreneurial competency and innovation are believed to be an essential combination in creating a growth of the enterprises (Georgellis, Joyce, & Woods, 2000; Man, Lau, & Snape, 2008; Mitchelmore, Rowley, & Shiu, 2014, p. 590). The Southeast Asian region shows a great potential, either geographically or socio-economically (Petri, Plummer, &

Table 3
Job growth expectations over the next five years in ASEAN-6 countries, GEM 2014

Country	No jobs	1-5 jobs	6-19 jobs	20+jobs
Indonesia	65.6	30.0	3.8	06
Malaysia	41.9	55.6	2.5	0.0
Philippines	56.1	37.9	5.1	0.9
Singapore	38.1	26.1	19.3	16.5
Thailand	72.1	21.2	5.7	1.0
Vietnam	50.0	42.5	5.9	1.6
ASEAN	54.0	35.6	7.0	3.4

Note: % of entrepreneurs of established businesses

Sources: Xavier et al. (2015, p. 43)

Zhai, 2012). The region is strategically located between South and North Asian region, including the Pacific countries. It also comprises a large market, with a high proportion of its population being in their productive age, indicating a potential for entrepreneurship.

This research focuses on entrepreneurs in the South East Asian region as the population target. The targets of inference are two demographic aspects, namely education and the age of the entrepreneur, and two essential entrepreneurial characteristics, namely competencies and innovation. The basic model was developed based on Cheraghi (2013), and Schott and Sedaghat (2014), as well as Mitchelmore and Rowley (2010). Cheraghi (2013) examined the prominent role of women in entrepreneurial activity, through developing their competence and innovation. Meanwhile, Schott and Sedaghat (2014) defined two important factors that affect entrepreneurial outcomes, namely entrepreneurial behavioural and society's institutions. Adopting Cheraghi's and the Schott and Sedaghat model, we define innovation as one of entrepreneurial outcomes, and competence and demographic factors as entrepreneurial behavioural. The entrepreneurial phase is considered in the model to capture the variability of entrepreneurs in the region. Meanwhile, society's institutions are assumed to be fixed and do not affect the relationships among factors. Mitchelmore and Rowley (2010) state that the entrepreneurs who acquired better competencies tend to produce a highly innovative product. Moreover, a

newly established enterprise shows better innovative products compared with others. Hence the proposed model is shown in Figure 1.

Based on Figure 1, this study explains interdependent (moderating) relationships among the factors that affect innovation. In addition, it provides an understanding of the innovation process in a different phase of entrepreneurial activities, which suggests a different action of entrepreneurship development.

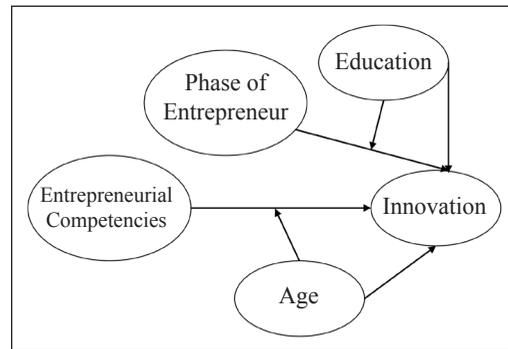


Figure 1. Basic model

This paper is organised into five sections, starting with the introduction, which provides the background and research model. The next section is a theoretical background and hypotheses, which discusses some key researches and literature on the topics, followed by hypotheses development. The third part presents the research methodology, which defines the data being used and how the research model is employed. Results and discussion make up the following section, and the conclusion forms the last section.

Theoretical Background and Hypotheses

Globalisation and liberalisation of the national market have created stiff competition between countries. This has led to the development of regional trade agreement like ASEAN Free Trade Area (AFTA). Petri et al. (2012) states that ASEAN is one of the strategic regional economic models studied extensively. Regional trade agreements affect entire economic sectors of the countries, and the small medium enterprise (SME) will be vulnerable if they are not supported by the state. Schwab (2015) indicates that productivity and innovativeness are key to

achieving competitiveness. Schwab’s study revealed that the more innovative countries are the most competitive ones.

Lindh and Thorgren (2016) observe that entrepreneurship education played a role in cultivating entrepreneurial culture, knowledge, and spirit. It is considered key to developing and stimulating the entrepreneurial process, and it provides tools for starting new ventures. Other studies also emphasised the importance of entrepreneurship education, such as Fayolle, Gailly and Lassas-Clerc (2006), Urban (2006), Ekpoh and Edet (2011), among others.

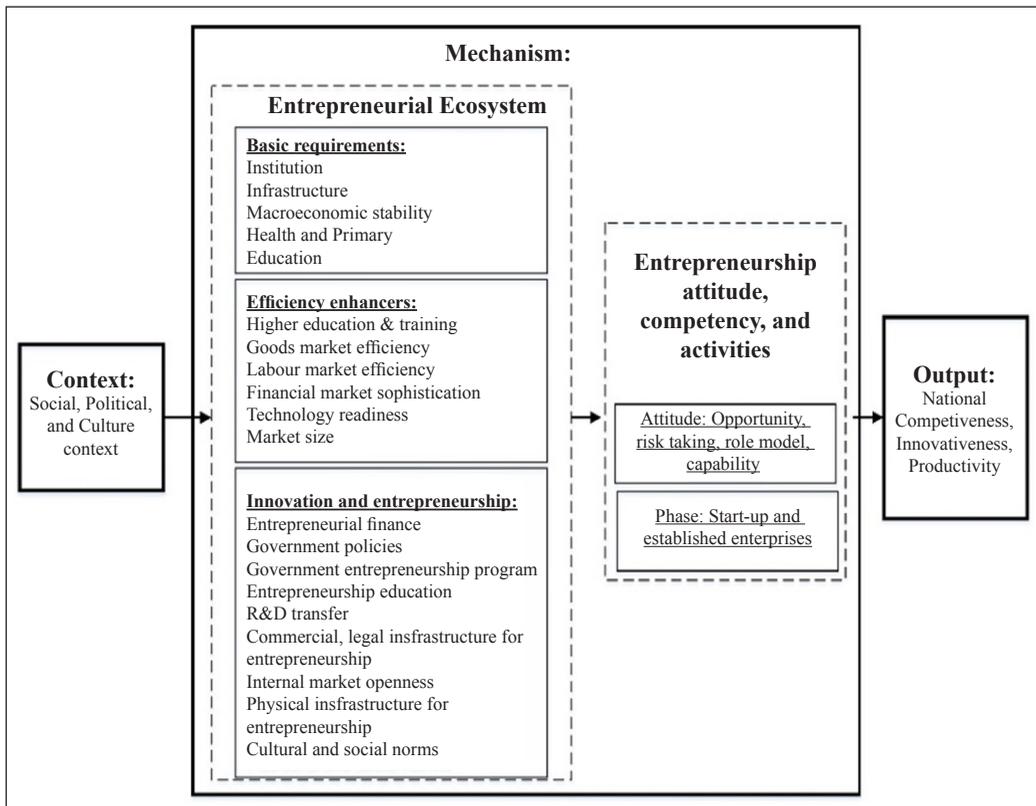


Figure 2. The GEM model of entrepreneurship

The GEM Entrepreneurial Model

The GEM model of entrepreneurship shows that the entrepreneurship ecosystem and activities are mechanisms in the social, political, and cultural context (Figure 2). The output were national competitiveness, innovativeness, and productivity, which may be represented by job creation, social and political development, and innovation (Levie & Autio, 2008; Ramos-Rodríguez,

Martínez-Fierro, Medina-Garrido, & Ruiz-Navarro, 2015). Figure 3 shows in detail that the phase of entrepreneurship, initially grows in its intention to develop early activity (nascent and up to 3.5 years) ventures, and finally established business (Kelley, Singer, & Herrington, 2016). This is explained within the framework of AEC, and which is discussed in the following section.

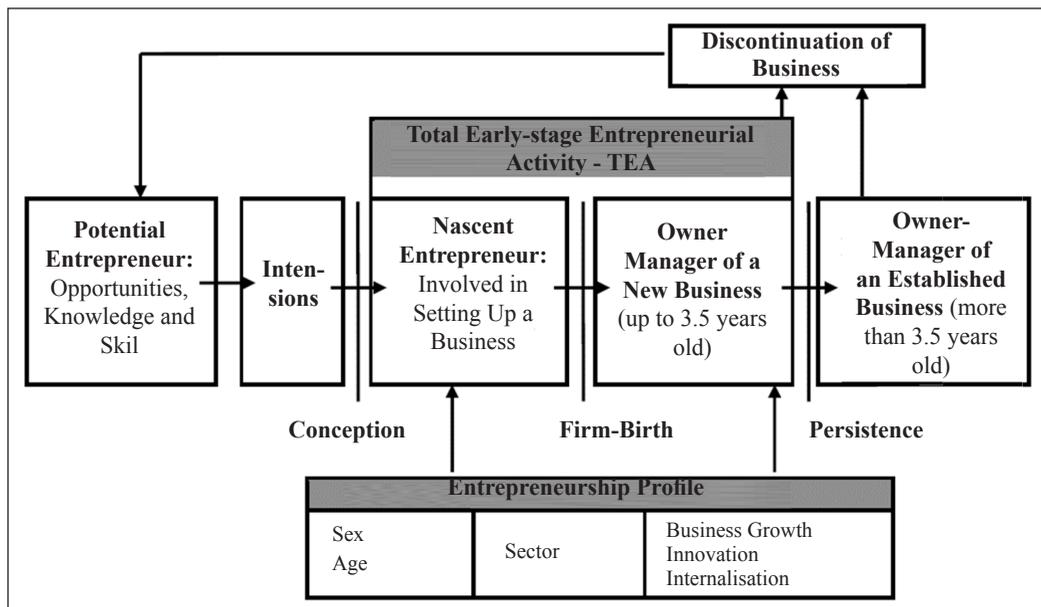


Figure 3. Phase of entrepreneur activity (Nawangpalupi et al., 2015)

Asean Economic Community Framework

The Asean was initially considered to be a political association, and it gradually began to focus on regional economic development, which led to the formation of Asean Economic Community - AEC in 2015 (Jetin & Mikic, 2016). The AEC led to the development of regional market consisting of 600 million peoples, in the 10

countries - Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. Several attractive characteristics for investors have been recognized, such as demographic profiles, rich in natural resources, low-cost labour, and entrepreneurial competency.

According to Austria (2011) AEC is characterised by a single market and production, free movement of goods,

services, investment, capital, and skilled labour. By transforming ASEAN into a single market and production base, the AEC enforces the competitiveness and connectivity of the region as a whole.

Entrepreneurial Competencies

Wennekers and Thurik (1999) define entrepreneurship at the micro level as entrepreneurial traits or attitude. It refers to a willingness to challenge risks and entrepreneurial activity, which indicates an effort in venturing into a new business derived from a new idea. Entrepreneurship is measured in terms of its attitude and activity and defined in terms of entrepreneurial performance. Hence, logically it makes sense that not all entrepreneurs are capable of spearheading a successful high-growth business venture. Bird (1995) in Mitchelmore and Rowley (2010) define entrepreneurial competencies as individual characteristics performed with a specific kind of knowledge, motives, traits, self-images, social roles, skill, and ability of creating or transforming ventures into a better achievement. Robbins and Judge (2018) identify some personal entrepreneurial competencies such as personal skills, initiative, ambition, adaptability and flexibility, the willingness to take risk, and the willingness to learn (in agreement with Kelley et al., 2016).

Entrepreneurial Competencies and Innovation

Mitchelmore et al. (2014) found that acquiring higher entrepreneurial competencies are

important for achieving business growth. The study was focused on the women-led SMEs in England and Wales. Marcotte (2014) confirmed the importance of the relationship between entrepreneurship and innovation. Mitchelmore and Rowley (2010) suggest that a higher level of competencies create a more innovative product.

Demographic Factors as Moderators

The population aged 18-64 represents the productive age, and is known as the demographic dividend, which was first proposed by Bloom, Canning, and Sevilla (2003). Bloom et al. (2003) studied the changes in population structures based on economic growth. They argued that economic behaviour and needs were varied at different stages of life, hence the changes in a country's age structure have a significant effect on its economic performance. For the developing countries, this would lead to a population explosion of young people. This will provide opportunities for economic growth by gaining better competencies through education. Research has indicated that there is a significant relationship between education and the career intention to become an entrepreneur (Wilson, Kickul, & Marlino, 2007). Education also provides individuals with entrepreneurial competencies, behaviour, and motivation (Solesvik, 2013).

Hypothesis Development

The hypothesis of this study, based on Figure 1 and theories found in literature review, is that innovation is developed by

entrepreneurial competency, and that it depends on the phase of entrepreneurial activity and demographic factors, namely age and education. The analysis was based on three working hypotheses.

H1: Innovation is affected by entrepreneurial competency, the phase of entrepreneurship, education, and the age of entrepreneurs. Singer, Amorós, and Arreola (2015) report that entrepreneurship supports socio-economic development of a country in the social, cultural, and political context. This socio-economic development includes job creation, innovation, and the creation of social values. Individuals in a relationship to their environment or community, consciously express and perform their activity to gain a better life or status, either economically or politically. It is believed that education leads to the acquisition of skills, drive and courage and will promote employment for the self and others as well (Ekpoh & Edet, 2011). Thus, entrepreneurial education is considered to be an effective strategy towards innovation.

H2: Entrepreneurial competency varies among their ages that affect innovation. According to Morris, Webb, Fu and Singhal (2013), competency refers to knowledge, skills, attitudes, values, and behavior in performing a particular task successfully. Entrepreneurial competency refers to individual abilities that are necessary in performing successful entrepreneurship. Mohsein, Halim, Ahmad and Farhana (2017) found that certain entrepreneurial

competencies influence innovativeness. However, the influence of demographic characteristics on performance of the entrepreneurs, was reported by Neumeyer and Santos (2018), and Mitchelmore and Rowley (2010). Hence a mechanism of achieving innovativeness by entrepreneurial competency is hypothesised, regarding their age. The proposed model tackles issues of the entrepreneurs' innovativeness regarding their phase (start-up or established entrepreneur) and competence. Thus, following hypothesis is developed.

H3: The phase of entrepreneurship varies based on levels of educations that affect innovation. Lindh and Thorgren (2016) state that entrepreneurship education is considered to be a strategic effort in developing an entrepreneurial culture and transferring entrepreneurial knowledge to young people.

METHODS

Data and Indicators

The GEM data was used to confirm the hypotheses, covering the ASEAN region, with six countries contributing to Global Entrepreneurship Monitor (GEM) survey in 2013. The GEM survey is randomly done from the adult population aged between 18 and 64 years. Data collection is organised and coordinated by Global Entrepreneurship Research Association - GERA, which has responsibility in cleaning and harmonising the global data. The GERA provides a standard questionnaire for every country, sets a standard requirement to conduct a survey,

and evaluates the survey process and result (Reynolds et al., 2005). Levie and Autio (2008) described and defined a theoretical grounding of the GEM questionnaire, the validity and reliability was defined carefully, to ensure applicability in each country and the result is scientifically approved.

Standard requirement in conducting the survey is controlled by GERA, namely minimum sample size is 2000 respondents for each country, and a proper random sampling design, such as multistage sampling design. The Global 2013 survey result can be found in Amorós and Bosma (2014). Table 4 shows the number of entrepreneurs in the six Asean countries.

Entrepreneurial competencies were measured based on the following indicators:

- (a) Perceived capabilities – those who believe they have the required skills and knowledge to start a business.
- (b) Perceived opportunities – those who see good opportunities to start a firm in the area where they live.
- (c) The fear of failure rate – those who perceive good opportunities to start a business who indicate that fear of failure would prevent them from setting up a business.
- (d) The entrepreneurial intention - who are latent entrepreneurs and who intend to start a business within three years.
- (e) The known start-up entrepreneurial rate - who personally knows someone who started a business in the past two years.

Each indicator is scaled using the binary option, Yes/No. The competency index (CI) was generated by applying the factor analysis to the indicators, by giving weight to each indicator based on the rotated values from the principal component.

Indicators of Phase of Entrepreneurship Activity

The phase of entrepreneurship activity (PHASE) is a dummy variable and defined based on Figure 3. The dummy is 0=if in early-stage entrepreneurial activity, which includes the start-up and new business up to 3.5 years of business operation, and 1 = if involved or owned in the established business operation within 3.5 years and more. The 3.5 years threshold adheres to definition of the phase of entrepreneurship in Kelley et al. (2016), which were also consistent with others, e.g. Tambunan (2009), Levie and Autio (2008), and Reynolds et al. (2005).

Table 4
Entrepreneurs in GEM data 2013 for Asean region

Country	Malay	Indo	Phil	Sing	Thai	Viet	Total
Number of Entrepreneurs	248	2126	683	300	1068	652	5077
%	4.9	41.9	13.5	5.9	21.0	12.9	

Source: GEM data 2013
Indicators of entrepreneurial competencies

Indicators of Innovation

Innovation is measured by three indicators, namely competitiveness level, new product development for new customer, and new product development with new technology. Based on Amorós and Bosma (2014), the competitiveness level was measured by “*Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?*” with the scale 1 = many, 2 = few, 3 = no. The new product development for new customer was measured by “*Will all, some, or none of your potential customers consider this product or service new and unfamiliar?*” with the scale 1 = all, 2 = some, 3 = none. And, the new product development with new technology is measured by “*Have the technologies or procedures required for this product or service been available for less than a year, or between one to five years, or longer than five years?*” with the scale 1 = less than a year, 2 = between 1-5 years, and 3 = longer than 5 years. The innovation index (II) is generated by summation of the three indicators, values from 3 (low level) up to 9 (higher level). The index shows a level of entrepreneurs’ effort in the development of competitiveness, new market, and new product.

Indicators of Education

Education was measured by the number of years of schooling, (1, 5, 8, 12, 14, 17, 20), EDU. This variable indicates the duration of schooling by the respondent; the longer this duration, the higher the level of education.

Indicator of Age

Age was measured in years, which indicated the age of entrepreneurs, which is between 18-64 years old.

Analysis

Based on Schott and Sedaghat (2014), the regression analysis was applied to two models, consisting of a basic model (Eq. 1) and an interaction model (Eq. 2), as follows:

$$II = \alpha + \beta_1 AGE + \beta_2 EDU + \beta_3 PHASE + \beta_4 CI + \varepsilon \quad [1]$$

$$II = \alpha^* + \beta_1^* AGE + \beta_2^* EDU + \beta_3^* PHASE + \beta_4^* PHASEDU + \beta_5^* CI + \beta_6^* CIAGE + \varepsilon \quad [2]$$

where CIAGE is the interaction terms of CI×AGE and PHASEDU is the interaction of PHASE×EDU. An estimation of the parameters was made using SPSS software.

RESULTS AND DISCUSSIONS

The profile of the entrepreneurs, including sex and age, and descriptive statistics of the variables are presented in Table 5.

The first result is a basic model that excludes the interaction term, shown in Table 6. Table 6B indicates that the basic model is significant and the R-square=5.4%

(*HI* is accepted). Although the R-square was small, the model is considered fit, since the hypothesis test is very significant (see Table 6B). This result indicates that innovation (II) is affected by phase, entrepreneurial competency (CI), age (AGE) and education (EDU). From Table 6C, we can see that the significance of the coefficient is almost zero indicated that all predictors have an effect on the innovation.

Table 5
Descriptive statistics of variables

Variables	Description	Mean	Std. Deviation
<i>Entrepreneurs Profile</i>			
Sex	Male (50.9%), Female (49.1%)		
<i>Variables of the models</i>			
II	innovation index (3-9)	4.75	1.22
CI	competency index (0-4)	2.65	1.14
EDU	Duration of education in year (1-20)	11.33	4.12
AGE	Age of entrepreneurs in year (18-64)	39.72	11.11
PHASE	Phase of entrepreneurship activity, 0 = early (21.2%), 1 = established (78.8%)		

Source: SPSS output

Table 6
Estimation of parameters basic model (Eq. 1)

A. Basic Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Basic model	.231 ^a	.054	.053	1.193		
B. ANOVA ^a						
Basic Model	Sum of Squares	df	Mean Square	F	Sig.	
Regression	377.038	4	94.259	66.274	.000 ^b	
Residual	6661.899	4684	1.422			
Total	7038.937	4688				
a. Dependent Variable: II						
b. Predictors: (Constant), EDU, PHASE, CI, AGE						
C. Coefficients						
Basic Model	Unstandardised Coefficients		Standardised Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	5.704	0.099			57.413	0.0
PHASE	-0.499	0.044		-0.146	-10.172	0.0
CI	0.169	0.018		0.138	9.637	0.0
AGE	-0.010	0.002		-0.094	-6.351	0.0
EDU	-0.016	0.004		-0.052	-3.524	0.0

Source: SPSS Output

From Table 6, the standardised coefficients of PHASE, AGE, and EDU, consecutively have negative effects on the innovation. The negative effect of the predictors has some implications: (a) the early phase of entrepreneurial activity is more innovative; (b) the younger entrepreneur is more innovative; and (c) the lower educated entrepreneur is more innovative. On the other hand, the competency index has a positive impact on the innovation, as indicated by the positive standardised beta coefficient. The higher the competent entrepreneur's results, the more innovative the entrepreneur.

Similar with previous results, it can be seen in the interaction model (Table 7) that the regression is significant (Sig. value is 0). The R-square model is 5.7%. The result of the interaction model (Table 7) shows the significance of the interaction term, which is formed in PHASEDU and CIAGE. The significance of the PHASEDU coefficient indicates an interaction between the phase of entrepreneurship (PHASE) and the education level (EDUC). Thus, **H3** is accepted. Similarly, the significance of CIAGE coefficients also indicates that the entrepreneurial competency (CI) has an interaction effect on the age of entrepreneurs (AGE). Hence, it proves that **H2** is also accepted.

The results and reference to the basic model (Eq. 1 and Table 6), show that the effect of the education level or the phase alone has a negative effect on the innovation level in entrepreneurship. However, the interaction between the

phase of entrepreneurship and the education level (based on the interaction model in Eq. 2 and Table 7) has a positive impact on the innovation level. This indicates that stronger innovations among firms cannot be built by education level alone, but the education level and the different phase of entrepreneurship have an effect on firm ability to innovate.

Thus, improvement in the educational system is vital for entrepreneurs to attain a higher innovation level (or to be able to create new products and services). As a result, it is suggested policies and programmes are based on research and development (R&D) for sustainable business.

The basic model shows age of the entrepreneurs has a negative impact on the innovation level. Table 7 however, shows the interaction of the competency index and the age of entrepreneurs can increase innovation. This is shown by the higher standardised beta coefficient of the interaction model of the competency index and the age of entrepreneurs. It implies that entrepreneurs who have a higher competency index and are more mature tend to exercise innovation better. The findings corroborate with earlier studies that innovating the business is a product of business competencies (Mohsein et al., 2017), while competencies are influenced by entrepreneurial education (Ekpoh & Edet, 2011; Lindh & Thorgren, 2016). Moghavvemi and Salleh (2014) confirm that entrepreneurs who do not have sufficient skills and capabilities regarding the new technology tend to have lower intention

Table 7
Estimation of parameters interaction model (Eq. 2)

A. Interaction Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Interaction model	.238	.057	.056	1.19076		
B. ANOVA						
Interaction Model	Sum of Squares	df	Mean Square	F	Sig.	
Regression	400.240	6	66.707	47.045	.000	
Residual	6638.698	4682	1.418			
Total	7038.937	4688				
a. Dependent Variable: II						
b. Predictors: (Constant), CIAGE, PHASEDU, AGE, EDU, PHASE, CI						
C. Coefficients						
Interaction Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	
	B	Std. Error	Beta			
(Constant)	6.003	.140		42.817	.000	
AGE	-.010	.002	-.092	-6.225	.000	
EDU	-.041	.009	-.136	-4.367	.000	
PHASE	-.825	.132	-.268	-6.256	.000	
PHASEDU	.031	.010	.146	3.023	.003	
CI	.002	.066	.001	.027	.978	
CIAGE	.004	.002	.141	2.609	.009	

Source: SPSS Output

to innovate. Thus, developing skills and competencies is important for innovation. Competencies usually develop over time, which implies that maturity of a person corresponds with competency in problem solving. This indicates that the maturity and competency index has a positive relationship, which supports the hypothesis of this study.

However, younger entrepreneurs tend to have a higher ability to innovate. This finding also confirms that of a previous study that entrepreneurial innovation is influenced by age (Schott & Sedaghat, 2014). Thus, innovation skills should be developed at a younger age. However,

while the maturity and competency index improve innovation and age alone improves innovation, intervention is needed to develop competencies among younger entrepreneurs.

Based on these propositions and findings, programs are recommended to support the development of youth entrepreneurs' capabilities to develop and grow the business so that they can innovate better. Koellinger (2008) found that innovation among start-ups is linked to more developed educational systems. Thus, proper entrepreneurial education and training would encourage better innovation for young entrepreneurs.

Studies have suggested that courses in entrepreneurship improve entrepreneurial skills (Thandi & Sharma, 2004), encouraging graduates to take on the entrepreneurial role more confidently (Garavan & O’Cinneide, 1994) and increase knowledge in the entrepreneurial stages (Ekpoh & Edet, 2011). Therefore, relevant programmes are vital based on the phases of entrepreneurship and age of entrepreneurs. Programmes in education and training that focus more on the development of new products, service and technology are important for those who are mature in entrepreneurship (or established businesses). Also, younger entrepreneurs need to be equipped with higher competencies to be able to innovate better. Improving entrepreneurial education requires strong roles to be played by business enablers, such as business consultants or coaches and educational institutions as well as the government (which is also the as policymaker).

CONCLUSION

The study shows that the competency index of ASEAN entrepreneurs has a significant relationship to their ability to develop new products or new markets and new technology. Higher education lowers innovation but it increases innovation in established firms. Moreover, young entrepreneurs are generally more innovative but the combination between of age and competency index would create stronger innovation. While innovation is necessary for strengthening a country’s competitiveness, this study suggests programmes for innovation,

mainly focusing on youths and those who have attained high competencies. Some recommendations for business enablers and the government are made so they can improve practices and capacity building for entrepreneurship education and training to create more innovative entrepreneurs.

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