

THE EFFECTS OF ENTREPRENEURSHIP, COMPETITIVENESS, AND TECHNOLOGY INNOVATION ON GROWTH: A CASE OF ASEAN ECONOMIC DEVELOPMENT

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***Abstract :** Even though previous empirical findings have provided profound insights to how entrepreneurship, innovation, knowledge, competitiveness, and economic growth are interrelated. However, a comprehensive understanding is still lacking concerning the interface of all of those variables: competitiveness, innovation, entrepreneurship and growth. The national economic growth on the aggregate level of economic activity is viewed as a country on being associated with review and smaller firms, as well as established firms, and it allows clearer understanding of why entrepreneurship is vital to the whole economy. Small and news firms generate innovations, fill market niches and increase competition, thereby contributing to resource reallocation in economic activity. Within the framework of potential efforts and strategies to employment and job creation for young people, entrepreneurship is increasingly accepted as an important means and a valuable additional strategy to create job and improve livelihood and economic independence of young people. For developed countries, ICT is an important enabler in entrepreneurial activity, especially for SMEs. Entrepreneurship and small business management is frequently referred to as one of the most important aspects in a country's economic development, in other words, it determines a country's competitiveness. This research found that entrepreneurship, country's competitiveness, and innovations indicators were the main drivers of economic growth. Economic freedom, in particular, seems to be acting as one of the principal accelerator toward economic development in ASEAN countries.*

***Keywords:** entrepreneurship, economic growth, technology, competitiveness, and globalization*

INTRODUCTION

A worldwide consensus on the critical role of competitive markets and entrepreneurs in economic development has emerged in the last decade. In developing countries, the primary barrier to economic growth is often not so much a scarcity of capital, labour or land as it is a scarcity of both the dynamic entrepreneurs that can bring these together and the markets and mechanisms that can facilitate them in this task. Entrepreneurs have taken role in the structural transformation of countries from low income, primary-sector based societies into high-income service and technology based societies. Previous researches have explained the role of entrepreneurs in the opposite poles of stagnating development (including war/conflict) and in accelerating

growth (including high innovation) situations (Lingelbach *et al.*, 2005; Naude, 2008).

Schumpeter identified innovation as the critical dimension of economic change (Poll & Caroll, 2006). He argued that economic change revolves around innovation, entrepreneurial activities and market power and sought to prove that innovation-originated market power could provide better results than the invisible hand & price competition. He argues that technological innovation often creates temporary monopolies, allowing abnormal profits that would soon be competed away by rivals and imitators. In his theory, these temporary monopolies were necessary to provide the incentive necessary for firms to develop new products and processes (Poll

& Carroll, 2006). Today, there is increasing recognition worldwide of the important role of technological entrepreneurship as the significant source of good jobs. The direct employment effects of tech-based start-ups are limited, but the additional opportunities both upstream and downstream and the “multiplier” effect throughout the economy typically outnumber the direct employment by a significant factor (Lalkaka, 2001).

At the same direction, competitiveness is critical for achieving economic growth and development. Therefore, building and sustaining competitiveness under the condition of globalization and increasing international competition has become the government's top priority at all levels—local, regional and national (Boschma, 2004). Only highly competitive economies can effectively cope with the domestic and international competition and produce target outcomes in the context of international specialization. National competitiveness - encompassing the components of productivity, efficiency and profitability - contribute to the acceleration of economic growth, increase in standard of living and social welfare, creation of new jobs and resolution of many economic and social problems. Economists today believe that factors like the private sector can contribute to economic growth, job creation, and national income—and hence to national prosperity and competitiveness. Invariably, domestic private sector resources in any economy are much larger than actual or potential external resources. The private sector contributes substantially to the Gross Domestic Product (GDP), and thus unleashing domestic resources—both financial and entrepreneurial—is likely to create a more stable and sustainable pattern of growth. Governments are becoming more sensitive to the need to create a friendly business climate, supportive of the needs of the private sector. Small and medium enterprises (SMEs), the major component of the private sector, can be engines of economic growth, cornerstones for creativity and innovation, and seedbeds of entrepreneurship.

Based on the premises of entrepreneurship, competitiveness, and technology innovation, this paper tries to

explore the recent empirical finding on the effects of those variables on ASEAN economic development for the last four years (2006-2009). This paper studies the main characteristics of the economic growth and defines a coherent theoretical framework of references that will lead to a broader understanding of the relationship between entrepreneurship, competitiveness, and technology innovation in an integrated conceptual model for gaining a sustained competitive economic development.

LITERATURE REVIEW

Entrepreneurship and Economic Growth

How is entrepreneurship good for economic growth? This question would seem to have a simple answer: Entrepreneurs create new businesses, and new businesses in turn create jobs, intensify competition, and may even increase productivity through technological change. High measured levels of entrepreneurship will thus translate directly into high levels of economic growth. Economic growth is the increase in the value of goods and services produced by an economy. It is conventionally measured as the percent rate of increase in real gross domestic product, or GDP. Growth is usually calculated in real terms, i.e. inflation-adjusted terms, in order to net out the effect of inflation on the price of the goods and services produced. In economics, “economic growth” or “economic growth theory” typically refers to growth of potential output, i.e., production at “full employment,” rather than growth of aggregate demand.

A nation's economic development depends on successful entrepreneurship combined with the force of established corporations. However, the beneficial value of this mechanism varies with the national income, as measured by GDP per capita. At low levels of national income, self-employment provides job opportunities and scope for the creation of markets. As GDP per capita income increases, the emergence of new technologies and economies of scale allows larger and established firms to satisfy the increasing demand of growing markets and to increase their relative role in the economy.

Economic development refers to a qualitative process that describes changes in

the overall economy aiming to enhance the economic well-being of a community regardless of its size. In economic literature, economic development is frequently described as being a three-legged stool where each leg represents one economic development strategy. The first leg usually refers to business attraction, the second one to business retention, and the third one to entrepreneurship development. However, because this analogy assumes the existence of equality and separation among economic development strategies, more useful analogy is that of a pyramid as Dabson (2005) pointed out.

According to Schumpeter (1934), when an entrepreneur stops innovating, she/he stops being an entrepreneur. He argued that day-to-day management of the firm is a routine and does not require the participation of entrepreneurs. Therefore, someone who establishes a new business by replicating existing firms is not an entrepreneur in a Schumpeterian sense. In addition, he introduced the notion of creative destruction arguing that it represents the main source of economic growth. In Schumpeter's words, it "*incessantly revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one*" (Schumpeter, 1934: 83).

As put by Aghion and Howitt (1998), Schumpeter's notion of creative destruction is a competitive process in which entrepreneurs are continuously looking for new ideas that will render their rivals' ideas obsolete. The fundamental element that induces this creative destruction is innovation. This innovation thereby makes the economy grows (Aghion & Howitt, 1998). In this paper, it is assumed a positive relationship between entrepreneurship indicators and economic growth.

Innovation and Economic Growth

The creation, dissemination, and application of knowledge have become a major engine of economic expansion. Corporations have come to rely more and more on this precious tool. It is a practice that has moved from the periphery of many corporate agendas right to the centre of their strategies for growth and leadership.

Most sectors and industries are currently experiencing what is called a "Schumpeterian renaissance": innovation is today the crucial source of effective competition, of economic development and the transformation of society (Torun, 2007).

It is difficult to agree on one single definition. However, we can argue without hesitation that innovation has proved to be: 1) an efficient stimulant for building world-leading organisations (such as Microsoft, Rolls Royce and Apple), 2) a discipline of creativity that attracts the best people (look at companies like Dyson, Egg and Google), 3) a message that reinforces a corporate ambition (3M, Toyota or Adidas), and 4) an instrument to foster leadership (think of BP, UPS, and H&M). It is no wonder why every CEO wants some of this "magic dust".

Modern economies are built with ideas, as much as with capital and labour. It is estimated that nearly half the US' GDP, for example, is based on intellectual property. The EU has set the 'Barcelona target' of increasing R&D to 3% of GDP by 2010 to become "the most competitive and dynamic knowledge-based economy in the world". Look at China: according to OECD estimations, in 2006 for the first time China spent more on R&D than Japan, becoming the world's second largest investor in R&D after the US.

Globalisation itself is a product of innovation. The application of constantly improved technologies to the massive means of transport and communication has produced an unprecedented level of global connectivity, of global awareness. Economies are becoming more interdependent, while cultures are becoming more permeable, transparent and stronger through an intensified exchange of goods, services, ideas, values, experts, problems and solutions (Torun, 2007).

In terms of the critical economic variables — wages, jobs, international competitiveness — the evidence is compelling that innovation-driven economies come out very ahead (Mandel, 2004). It means that economic growth can basically be attributed the following fundamental forces: an increase in factors of production, improvements in the efficiency of allocation across economic

activities, knowledge and the rate of innovation. Given full employment and efficient allocation, growth is thus driven by knowledge accumulation and innovation. The process of innovation is typically modelled as a function of the incentive structure, i.e. institutions, assumed access to existing knowledge, and a more systemic part. Innovation also implies that the stock of (economically) useful knowledge increases. In other words, innovation is one vehicle that diffuses and upgrades already existing knowledge, thereby serving as a conduit for realizing knowledge spill over (Braunerhjelm, 2010). Therefore, in this paper, it is assumed that innovation has a positive relationship with economic growth.

Competitiveness and Economic Growth

According to World Economic Forum (WEF), which creates the Global Competitive Index (GCI), three pillars construct country's competitiveness that leads to economic growth: the macroeconomic environment, the quality of public institutions, and technology. Macroeconomic stability is important for growth. Although it is certainly not true that macroeconomic stability alone can increase the growth rate of a nation, it is no less true that macroeconomic disarray kills its growth prospects. Firms cannot make informed decisions in environments where the inflation rate is in the hundreds, typically as a result of public finances being out of control. The banking system (which is essential if an economy is to grow in the medium and long run) cannot function if the government runs gigantic deficits (especially if, as a result, it forces banks to lend it money at below-market interest rates). The government cannot provide services efficiently if it has to make enormous interest payments on its past debts. In addition, the business sector suffers unnecessarily if the government wastes the taxes that they pay away. In sum, the economy cannot grow unless the macro environment is favourable. This is the idea that the first pillar of the GCI is meant to capture.

The second pillar of the GCI relates to public institutions. Although, in a market economy, wealth is largely created by

private businesses, these businesses have to operate within a country and have to deal with the institutions created and maintained by the government. It is important, for example, that property rights are guaranteed by a legal and judicial system. Private companies cannot operate efficiently in environments where contracts cannot be enforced or where the rule of law is weak or nonexistent. Firms may find it too expensive (maybe prohibitive) to do business in countries where corruption is rampant. One of the most exciting areas of economic research today tries to quantify the importance of institutions for long-run economic growth (Acemoglu *et al.*, 2002). As a result, the GCI measures the soundness of the public institutions and it introduces it as one of the three pillars of economic growth and development.

Finally, the third pillar is technological progress. One of the main lessons of neoclassical growth theory is that, in the long run, an economy cannot grow unless technological progress occurs (Solow, 1956). The key difference between rich and poor countries is not that the citizens of rich countries have more rice, more meat, or more milk (which they do) but that they have more and better things. If we sit in a rich country and simply look around, we will notice that most of the products we see did not exist just a few years ago: from the computer to colour TV, from genetically modified food to the latest designed drugs. Moreover, the products that did exist are much cheaper now than they were in the past or their quality has improved dramatically (Nordhaus, 1994). Technological progress is, therefore, at the heart of economic growth. In addition, the reason for thinking that, in the long run, no growth is possible without technological improvements is that the other potential determinants of growth must run into diminishing returns. For example, institutions and the macroeconomic environment can have important consequences for growth in countries with terrible environments. Nevertheless, once institutions are more or less right, and once the macro economy is more or less stable, additional improvements along these lines will probably have little or no effect on economic growth. This contrasts with

technological progress since there do not seem to be good arguments that would suggest that there are diminishing returns to ideas. Moreover, if there were, they would certainly not be empirically acceptable since worldwide technological progress does not seem to be decelerating. In fact, the contrary appears to be true.

We should note that three “pillars of growth” are not independents. In fact, they interact to support or to hinder sustained growth, as noted by Sachs and McArthur (2002: 39): “*these three factors are interwoven—strong institutions, for example, are needed for technological development to occur; a sophisticated technology base will contribute greatly to macroeconomic stability—but they do each have close and statistically distinct relationships with recent trends in economic growth.*”

METHODOLOGY

In this paper, the first and second pillars of the GCI are assumed to have positive relationship on economic growth. The study analyzes the nexus of entrepreneurship, competitiveness, and ready to the networked world on growth by using the model below:

$$EC = \beta_0 + \beta_1 GCI + \beta_2 EFS + \beta_3 STRB + \beta_4 SLRI + \beta_5 NBREG + \beta_6 NRP + \beta_7 NRTM + \beta_8 EDB + \beta_9 ICTE + \beta_{10} GII + \varepsilon$$

Where

Economic growth (EC), the dependent variable, is represented by GDP growth (annual %). GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Competitiveness indicators:

Global Competitiveness Index (GCI) is derived from Global Competitiveness report that assesses the ability of countries to provide high levels of prosperity to their citizens. This in turn depends on how productively a country uses available resources. Therefore, the Global

Competitiveness Index measures the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity.

Economic Freedom Score (EFS) is derived from the Index of Economic Freedom, which is a series of 10 economic measurements created by the Heritage Foundation and the Wall Street Journal. Its stated objective is to measure the degree of economic freedom in the world’s nations. The highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labour, capital, and goods, and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself (Index of Economic Freedom, 2008).

Start-up procedures to register a business (STRB) is derived from World Development Indicator. Start-up procedures are those required to start a business, including interactions to obtain necessary permits and licenses and to complete all inscriptions, verifications, and notifications to start operations. Data are for businesses with specific characteristics of ownership, size, and type of production.

Strength of legal rights index (SLRI) is derived from World Development Indicator. It measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit.

Entrepreneurship indicators:

New business registered (NBREG) is derived from International Finance Corporation’s micro, small, and medium-size enterprises database. New businesses registered are the number of new firms, defined as firms registered in the current year of reporting.

Number of resident patent per million people (NRP) is derived from WIPO Statistic Database. Patent applications are

worldwide patent applications filed through the Patent Cooperation Treaty procedure or with a national patent office for exclusive rights for an invention—a product or process that provides a new way of doing something or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 20 years.

Resident trademark applications per million populations (NRTM) is derived from WIPO Statistic Database. Trademark applications filed are applications to register a trademark with a national or regional Intellectual Property (IP) office. A trademark is a distinctive sign that identifies certain goods or services as those produced or provided by a specific person or enterprise. A trademark provides protection to the owner of the mark by ensuring the exclusive right to use it to identify goods or services, or to authorize another to use it in return for payment. The period of protection varies, but a trademark can be renewed indefinitely beyond the time limit on payment of additional fees. Direct resident trademark applications are those filed by domestic applicants directly at a given national IP office.

Ease of Doing Business Index (EDB) is an index created by the World Bank. Ease of doing business index ranks economies from 1 to 183, with first place being the best. Higher rankings indicate better, usually simpler, regulations for businesses and stronger protections of property rights. The index ranks the simple average of the country's percentile rankings on 10 topics covered in the World Bank's Doing Business. EDB is used as proxy for conducive environment for entrepreneurship to grow.

Innovation indicators: Information and communication technology goods exports (ICTE) are used as proxy of technological change variable, which includes telecommunications, audio and video, computer and related equipment; electronic components; and other information and communication technology

goods (as used in World Development Indicators). In this variable, software is excluded. ICT goods exports as a percentage of total exports is calculated for each country by dividing the value of its ICT goods exports by the total value of its goods exports. The result is then multiplied by 100 to be expressed as a percentage.

Global Innovation Index (GII) is a global index measuring the level of innovation of a country, produced jointly by The Boston Consulting Group (BCG), the National Association of Manufacturers (NAM), and The Manufacturing Institute (MI), the NAM's nonpartisan research affiliate. The overall measure of innovativeness of an economy is obtained by taking a simple average of the scores along the input and output pillars. In particular, a combination of qualitative and quantitative data is used for the computation of the GII. The qualitative data is obtained from the Executive Opinion Survey, a global CEO survey conducted by the World Economic Forum. The quantitative data comes from other international agencies.

STATISTICAL RESULTS AND IMPLICATIONS

The panel data multivariate regression analysis of six ASEAN countries during 2006-2009 reveals an interesting result below.

Generally, all indicators of three independent variables (entrepreneurship, competitiveness, and innovation) support the hypotheses. Entrepreneurship, competitiveness, and innovation influence positively and significant to ASEAN economic growth for the last four years. These empirical findings strengthen previous research related to the positive effect of those variables on economic growth, such as the positive effect of entrepreneurship on growth (Ayyagari & Beck, 2003; Beck et al., 2004; Schramm, 2004; Hoffman, 2005), competitiveness on country performance (European Commission, 1999; Ketals, 2004; Porter *et al.*, 2004; Thompson & Ward, 2005), and innovation on growth (Statistic Canada, 2002; Goh, 2004; Trajtenberg, 2005).

Model 1: Heteroskedasticity-corrected Dependent variable: GDPGR

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-160.805	42.0281	-3.8261	0.00210	***
GCI	34.7971	6.87312	5.0628	0.00022	***
EFS	22.0434	9.01259	2.4458	0.02944	**
STRB	14.381	1.40894	10.2070	0.00001	***
SLRI	6.43055	0.872957	7.3664	0.00001	***
NBREG	2.73809	0.818138	3.3467	0.00525	***
NRP	3.27569	1.41046	2.3224	0.03708	**
NRTM	0.821653	1.31166	0.6264	0.54188	
EDB	2.15581	1.09381	1.9709	0.07041	*
ICTE	8.71732	2.20917	3.9460	0.00167	***
GII	19.0947	2.88077	6.6283	0.00002	***
Statistics based on the weighted data:					
Sum squared residual	26.57564	S.E. of regression		1.429783	
R-squared	0.986098	Adjusted R-squared		0.975405	
F(10, 13)	92.21387	P-value(F)		2.15e-10	
Log-likelihood	-35.27782	Akaike criterion		92.55563	
Schwarz criterion	105.5142	Hannan-Quinn		95.99355	
Statistics based on the original data:					
Mean dependent variable	4.615226	S.D. dependent variable		3.152496	
Sum squared residual	73.78464	S.E. of regression		2.382381	

The coefficient and significance value of competitiveness indicators explicitly reveals that stable, transparent, and accountable government governance are the main factor to propel growth. According to the Cato Institute, higher economic freedom promotes participation and collaboration (Cato Institute, 2006). Also claimed is that higher economic freedom is extremely significant in preventing wars, a basic condition to grow the economy. Governments promote economic freedom when they establish a legal structure that provides for the even-handed enforcement of contracts and the protection of individuals and their property from aggressors seeking to use violence, coercion, and fraud to seize things that do not belong to them. Governments also enhance economic freedom when they facilitate access to sound money. However, economic freedom also requires governments to refrain from many activities. They must refrain from actions that interfere with personal choice, voluntary exchange, and the freedom to enter and compete in labour and product markets. Economic freedom is reduced when taxes, government expenditures, and regulations are substituted for personal

choice, voluntary exchange, and market coordination. Restrictions that limit entry into occupations and business activities also retard economic freedom. It implies that ASEAN countries need to maintain the stability and increase the best practices of government governance. The ASEAN countries need to implement wide-ranging reforms, including macro-stabilisation programmes, price liberalisation, privatisation and trade-barrier reductions.

ASEAN countries must foster entrepreneurial activities and business innovation as key step toward increasing the ASEAN economic competitiveness. The public sector plays an indispensable, and evolving, role in sustaining a stable and equitable pattern of economic, social and, for that matter, SME development. An implied imperative in this regard is good governance and a conducive policy environment - especially in the promotion of entrepreneurial initiatives, private enterprise, on-going learning and innovation, and cross-border linkages and collaboration.

The ASEAN's entrepreneurship policies must be based on improving commercial conditions, providing incentives, and facilitating access to

investment funding for start-up businesses. It means that ASEAN countries should create a national innovation policy that centres on a broad agenda to fuel a nation's innovative capacity and it seeks action from government, industry, academia and workers. A national innovation strategy builds on a contemporary understanding of innovation and tries to create a consensus to act on the changes required to establish an effective national framework. It requires to optimize the entire society for innovation with focus to three categories: (1) talent – the human dimension of innovation, including knowledge creation, education, training and workforce support, (2) investment – the financial dimension of innovation, including R&D investment, support for risk-taking and entrepreneurship, and encouragement of long-term innovation strategies, and (3) infrastructure – the physical and policy structures that support innovators, including networks for information, transportation, health care and energy; intellectual property protection; business regulation; and structures for collaboration among innovation stakeholders.

The ASEAN countries' innovation policies should centre in spurring productivity growth and innovation in all firms and sectors, including both their traded and non-traded sectors, and in services as well as goods production. In doing so, ASEAN countries need to balance the interests of both their workers and their consumers/taxpayers over both the short-term and the long-term. ASEAN countries' support both for factor conditions—including skills development, investing in innovation infrastructure, supporting knowledge production and transfer, and ensuring the widespread use of ICT—and for competitive domestic markets is fundamental to achieving productivity growth and innovation. Therefore, ASEAN should let fair competition principles in order to implement the best innovation policies that will force other countries to ratchet up their game, enhancing the competitiveness of all countries and raising the welfare of all citizens. In addition, at the same time, ASEAN countries should respect property rights, while being neutral with regard to country of ownership.

CONCLUSION

To sustain its competitive economic growth, ASEAN countries should foster an entrepreneurship policy that is able to: (1) encourage economic agents to conceptualize business ideas, (2) facilitate the entry of new businesses, whether in indirect measures (i.e. the facilitation of entry by modifications or improvements of institutions, regulations and/or infrastructures) or in direct measures (i.e. the facilitation of entry by measures directly targeting economic agents, which potentially might start a business), and (3) facilitate the growth of businesses.

To support conducive environment for higher ASEAN economic freedom, certain policies can be fostered, that include: (1) enact competition laws, as they can make positive contributions to economic growth, price stability, industry development, macroeconomic stabilization efforts, and consumer welfare, (2) incorporate explicit provisions to ensure that all government business activities are adequately covered, (3) craft specific laws to address the special circumstances of industries undergoing regulatory reforms, and (4) work toward convergence in competition laws and cooperative efforts in the enforcement of such laws with member countries.

ASEAN government action can usefully focus on a few generic functions comparable to nurturing conducive innovation environment to help them grow. It can facilitate the articulation and implementation of innovative initiatives, since innovators need basic technical, financial, and other support. The government can reduce obstacles to innovation in competition and in regulatory and legal frameworks. Government-sponsored research and development (R&D) structures can respond to the needs and demands of surrounding communities. Finally, the educational system can help form a receptive and creative population.

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