Abstract

The Competitiveness of Thailand: Economic Analysis from Competitiveness Reports

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An important question for researchers and policy markers is *how to efficiently allocate limited resources* for sustainable economic growth. In this paper, *Global Competitiveness Reports* of the World Economic Forum (WEF) and the *World Competitiveness Yearbooks* of the International Institute for Management Development (IMD) have to been used to identify *important strengths* and *important weaknesses* of Thailand. Important strengths and weaknesses are identified based on two criterions. First criterion is the contribution or the "weight" of each factor in the national competitiveness score. The contribution of each factor can be determined statistically; however, not without difficulty. The second criterion is the ranking among a group of countries. Factors that have both high contribution and good ranking are important strengths while factors that have both high contribution and bad ranking are important weaknesses. Relying on the subcomponents of the national competitiveness statistics, the strengths of Thailand lie in its big market size, strong labor market conditions and good infrastructure system. However, the weaknesses of Thailand lie in its poor health-related factors, technological readiness, and institutions. Finally, we provide some recommendation on how to improve the national competitiveness of Thailand at present and in the future.

1. Introduction

In recent decades, competitiveness of nations has been a topic that receives a growing attention among businessmen and policy markers worldwide. Increasing globalization and reduction in transportation and communication barriers make it increasingly more essential to be well-informed in order to keep up with the competitors, which could be from the opposite side of the globe. For businessmen, the competitiveness of nations can provide valuable information for making many business decisions such as determining locations for new operations and investment plans. For policy makers, they can use the national competitiveness statistics as yardsticks for evaluating past performance and areas for future improvements.

The World Economic Forum, or WEF, has studied national competitiveness and published their national competitiveness indexes and rankings since 1979. Today, WEF publishes national competitiveness statistics that cover more than 100 countries in all continents. The International Institute for Management Development, or IMD, is another leading provider of national competitiveness statistics. IMD has studied and published their national competitiveness statistics since 1989. Today, the national competitiveness statistics of IMD is constructed from more than 300 criterions. With the growing interest and the greater availability of up-to-date national competitiveness statistics, we find that it is essential to analyze and evaluate the competitiveness of Thailand critically. In this paper, we rely on the cross-country national competitiveness statistics (and the subcomponents) from the *Global Competitiveness Reports* of WEF and the *World Competitiveness Yearbooks* of IMD. Lessons from the analysis and evaluation of Thailand competitiveness will provide crucial ingredient for formulating and implementing national policies that enhance the well-being of Thai people.

This paper is organized as follows. In section 2, we discuss the construction of various national competitiveness indexes. In this paper, we focus on the national competitiveness statistics from the two leading providers; WEF and IMD. Nevertheless, the concept of national competitiveness still remains a controversial and misunderstood concept. Therefore, it is essential to discuss the definition of national competitiveness.

This is accomplished in section 2. In section 3, we evaluate the overall competitiveness of Thailand. In particular, we present the overall national competitiveness of Thailand and investigate how Thailand performed against the rest of the world and, especially, to major countries in Asia in terms of national competitiveness. In this section, we also investigate whether there are any major discrepancies between the two providers of the national competitiveness ranking. Furthermore, subcomponents of the national competitiveness statistics are used to evaluate areas that are important strengths and weaknesses of Thailand. In section 4, we offer our recommendations as a preliminary guideline for promoting Thailand competitiveness. It is worth to note here that strengths and weaknesses of any countries are dynamic rather than static in nature (as emphasized in the methodology of WEF). This means that factors that are important strengths *at present might not* be important strengths *in the future*. For example, there is a consensus view among economists that *"cheap labor"* cannot be the source of sustainable economic growth. We address this point for Thailand in this section. In section 5, we discuss limitations of national competitiveness statistics. It needs to be recognized that the methodology in quantifying the national competitiveness is far from perfect. First, the methodologies used in quantifying the national competitiveness have greatly benefited from research in economic growth literature. However, it is obvious that the methodologies adopted by WEF and IMD are not as *rigorous* as what have been proposed in the economic growth literature. The reason for this (even though both WEF and IMD do not mention this explicitly) is to make the reports *accessible* to general audiences. Second, the validity of the national competitiveness statistics as well as our recommendations lies in the validity of the underlying assumptions assumed. Future research needs to address these issues. Therefore, the recommendations that we gave should be viewed as educated suggestions. Finally, we provide conclusion in section 6.

2. The construction of national competitiveness index

In this section, we discuss the construction of various competitiveness indexes used in this paper. Understanding the construction of these indexes will be important for

understanding the linkage between the concept (of national competitiveness) and its measurement. We start off by discussing the definition of national competitiveness. Then, we discuss the methodology in constructing the *Global Competitiveness Index* reported in the *Global Competitiveness Reports* of WEF. Next, we discuss the methodology in constructing the national competitiveness reported in the *World Competitiveness Yearbooks* of IMD.

2.1: What is national competitiveness?

Despite its widespread recognition, national competitiveness remains a controversial and misunderstood concept (see Krugman, 1996 and Porter, Ketels, and Delgado, 2007). First, one might attempt to interpret competitiveness of nations in "the same way that corporations [compete]… [and] the purpose of trade is to generate exports, which create jobs" (Krugman, 1996, page 18). With this approach, national competitiveness will reflect the ability of a country to compete in the global market for its market share. Krugman (1996) has dubbed people who hold this view as *mercantilist* and argued at length that this view is *inappropriate* and even "*dangerous*". In particular, we know from the classical trade theory that international trade *is not a zero-sum game* (i.e. both players can be made better off). Therefore, there is no one-to-one relationship between global market shares and well-being of people. Nevertheless, this does *not* imply that international trade is not an important factor for well-being of people; particularly in many developing countries in which their income greatly depend on their export. However, this does imply that the mercantilist's view is too naïve.[1] Second, one might attempt to interpret national competitiveness by drawing an analogy with the degree of competition in markets (i.e. how close are markets in an economy to the perfect competition). This view is clearly incorrect since there is no reason to expect any relationship between the degree of competition in markets and well-being of people (for example, it is necessary to have only a few producers producing at a large scale for the airplane industry to exist at all!).

[1] Also, the mercantilist's view give a rational for national policies that can be obviously contradict with the goal of improving the well-being of people such as keeping wages low to enhance competitive advantage in exporting.

Then, how should we define national competitiveness? We have to admit that the concept of national competitiveness at present is far from complete and it still remains a controversial concept. However, in the past years, some progress has been made in improving the definition of national competitiveness. First, most researchers today would generally agree that the *mercantilist*'s view is incorrect (again, it is incorrect not because international trade is not important but focusing on international trade *alone* is incomplete). Second, the ultimate goal of national competitiveness is the improvement in the well-being of people (i.e. the reason that a country should have strong national competitiveness, whatever it means, is to have high and sustainable level of well-being of its people).[2] Below, we summarize the definition of national competitiveness adopted in the Global Competitiveness Reports of WEF and the World Competitiveness Yearbooks of IMD in table 1.

Table 1: Definitions of national competitiveness of WEF and IMD

	WEF	IMD
Definition of national competitiveness	[National] competitiveness [is defined] as "the set of institutions, policies, and factors that determine the *level of productivity* [and *growth potential of productivity*] of a country… [that] sets the sustainable level of prosperity that can be earned by an economy" (Sala-i-Martin *et al.*, 2007).	[National] competitiveness [is defined] as "the ability of nations to create and maintain an environment, which sustains the competitiveness of enterprises [which are the wealth creators] … in their ability to compete domestically and internationally" (IMD, World Competitiveness Yearbook).

Note: "wealth creators" of IMD can be state-owned enterprises
Source: the Global Competitiveness Report 2008-2009 of WEF and the World Competitiveness Yearbook 2008 of IMD

The competitiveness definitions of WEF and IMD are consistent with the two points that we raised above.[3] In particular, both definitions are not the mercantilist's view

[2] Aiginger (2006) proposes a definition of national competitiveness as "the ability of a country or location to create welfare" In his paper, he summarized and analyzed 21 definitions of national competitiveness (including definitions from IMD and WEF).
[3] The term "prosperity" used in the WEF's definition be interpreted loosely as the same as "wealth", the term used in the IMD's definition. However, enhancing "prosperity" or "wealth" is consistent with

since both do not define competitiveness in terms of global market shares. The definition of WEF emphasizes *productivity* (which can be defined as obtained output per inputs used). A common measure of productivity is GDP (gross domestic product) per capita.[4] In this regard, an improvement in productivity is one of the causes of improvement in the well-being of people. It is one of the causes (i.e. not the single cause) since there are factors beyond income of each person (which, ultimately, is used to purchase goods and services) that are the determinants of the well-being of people (such as better ecological system, greater freedom, etc). On the other hand, IMD emphasizes the ability of enterprises to "*compete domestically and internationally*" in their definition. At the first look, it might seem that the definition from IMD does not relate to the well-being of people. However, an article by Stéphane Garelli (who is the director of IMD's World Competitiveness Yearbook), "Competitiveness 20 Years Later" which discusses the methodology of IMD in constructing their national competitiveness index and is published in the World Competitiveness Yearbook 2008, clearly illustrates the relationship with the well-being of people: "Competitiveness is how a nation manages the totality of its resources and competencies to increase the prosperity of its people" (the World Competitiveness Yearbook 2008 page 34).

Though, the notions of national competitiveness of WEF and IMD are *not identical*. First, IMD clearly emphasizes that nations are always *competing with one another*. WEF, on the other hand, does not emphasize this view (at least explicitly). It is correct that countries are competing with one another in the sense that factors in the foreign countries (may be a change in some elements of foreign market) can affect firms and, ultimate, people in the domestic country. Changes in the market shares, resources allocation, or even political and military power in the foreign countries can have negative consequence to the welfare of people in the domestic country (i.e. it is possible that they win and we lose). However, competition between countries can also be *beneficial to all countries* (i.e. competition in improving technology, improving management skills, etc.). Therefore, it is *misleading* to encourage the slogan that "if they win we will lose"

enhancing the well-being of (at least some) people. Of course, this approach is still far from complete since it still neglects the distributional aspect of "prosperity" or "wealth".

[4] WEF defines productivity as output per inputs which are human capital, physical capital and natural resources. However, it is obvious that an "improve" in productivity in this sense is consistent with an increase in output per capita.

(therefore, we must do whatever it takes that make us a winner and other players losers) since it is possible that *all players can win*. Second, the methodologies in constructing the national competitiveness index of WEF and IMD are greatly different from each other. As we have discussed, the national competitiveness indexes of WEF and IMD are *not so much different* from each other *at the conceptual level*. However, it *at the measurement level* (measurement of national competitiveness) that WEF and IMD are greatly different from each other. In order to clarify this issue, next, we discuss the methodology in constructing the Global Competitiveness Index of WEF. Then, we discuss the methodology in constructing the national competitiveness reported in the World Competitiveness Yearbook of IMD.

2.2: The Global Competitiveness Index

Since 1979, the World Economic Forum (WEF) has been studying and publishing national competitiveness indexes in their annual Global Competitiveness Reports. The Global Competitiveness Index was first reported in the Global Competitiveness Report in 2004.[5] In particular, the objective of the Global Competitiveness Index is designed to "unify" the two existing national competitiveness indexes (in 2004) reported in the Global Competitiveness Report; the Growth Competitiveness Index and Business Competitiveness Index (Sala-i-Martin and Artadi, 2004). Below, we briefly summarize the key features of the methodology adopted in the Global Competitiveness Index (for more discussion, see Global Competitiveness Report various issues).

The Growth Competitiveness Index was initiated by the idea proposed by McArthur and Sachs (2001). Mainly, the Growth Competitiveness Index is aimed at capturing the *macroeconomic* aspects of national competitiveness (Sala-i-Martin and

[5] The methodology in quantifying the competitiveness of nations used by WEF has been changed throughout their publication. This change in the methodology reflects the accumulation of knowledge and empirical evidence in economics and business literature on factors that are crucial for the national productivity. For example, during 1990s, the quality of institutions has gained significant attention among growth economists as a determinant for sustained economic growth. In 1990s, WEF incorporated the quality of institutions into their global competitiveness index. From the business literature, the concept of "cluster" as put forth by Michael Porter has gained attention among business theorists and has been incorporated into WEF global competitiveness index.

Artadi, 2004).[6] The construction of Growth Competitiveness Index lies mainly on two principles. First, the Growth Competitiveness Index composes of three pillars; Macroeconomic environment, public institutions, and technology. The macroeconomic environment pillar measures how well are the i) macroeconomic stability (i.e. likelihood of recession, inflation, government surplus/deficit, etc), ii) country credit rating, and iii) composition of public spending (i.e. the usefulness of the public spending) in each country. The public institutions pillar measures i) the effectiveness of contracts and law and ii) the rarity of corruption activities in each country. The technology pillar measures the extent of i) innovation, ii) technology transfer, and iii) information and communication technology. Second, countries are classified into *core vs. non-core* countries and they are assigned different weighting scheme in the Growth Competitiveness Index. The core countries are countries that technology is *relatively more* important for their competitiveness. On the other hand, the non-core countries rely *relatively less* on technology in their competitiveness.[7]

The Business Competitiveness Index was initiated by the idea proposed by Porter (2001). The Business Competitiveness Index is aimed at capturing the *microeconomic* aspects of national competitiveness (Sala-i-Martin and Artadi, 2004).[8] Porter (2001) argues that growth economists often focus mainly on the macroeconomic factors (as captured in the Growth Competitiveness Index discussed above) while paying little attention on the microeconomic factors. In particular, it is *necessary* for a country to have stable and predictable macroeconomic environment (i.e. stable and predictable political environment, safe and sound financial system, etc), good public institutions (i.e. good legal system, uncorrupted political leaders and etc.) and technological progress (i.e. improvement and investment in R&D, etc.) in order to prosper. However, these are not *sufficient* for prosperity. For prosperity to occur, firms need to have productive

[6] In addition, the Growth Competitiveness Index captures factors that are relatively *dynamic* (i.e. frequently change overtime) which influence the future *growth potential* (or simply the income per capita growth) of a country (Sala-i-Martin and Artadi, 2004).

[7] In particular, for non-core countries, all there pillars (macroeconomic environment, public institutions, and technology) receive equal weight (i.e. 1/3). However, for the core-countries, the weight for technology pillar will be 1/2 while the weight for each of the other two pillars is 1/4.

[8] In addition, the Business Competitiveness Index captures factors that are relatively *static* (i.e. not frequently change overtime) which influence the *current level of income per capita* growth of a country (Sala-i-Martin and Artadi, 2004).

managerial skills and *business environment* (i.e. the microeconomic aspect of production).

In 2004, WEF has started publishing the Global Competitiveness Index with the aim to "unify" the Growth Competitiveness Index and Business Competitiveness Index. The Global Competitiveness Index relies on three principles. First, the determinants of national competitiveness (or the determinants of "productivity" as emphasized by WEF) are undeniably *many*. Growth economists have studied the determinants of productivity for many decades. Hundred of variables have been studied and identified as the *potential determinants* of economic growth (see Durlauf, Johnson, and Temple, 2005).[9] To adequately reflect this, more than 100 criterions have been used to construct the Global Competitiveness Index (in their 2007 publication, 113 criterions are used). These criterions are grouped into 12 pillars according to WEF and are presented in table 2.

Second, WEF follows (closely but not exactly) the methodology suggested by Porter (1990) in classifying nations into *stages of development*. The rational for this is the recognition that "the main factors determining competitiveness for poor countries are essentially different from those that matter in more advanced economies" (Sala-i-Martin and Artadi, 2004, p. 55). Stages of development are classified into 3 stages; factor-driven stages, efficiency-driven stage, and innovation-driven stage. In the factor-driven stage, the main drive for economic growth is the *endowed resources*. At this stage, countries simply transform endowed resources into goods and services using foreign technology. Cheap inputs (i.e. labor and natural resources) and comparative advantage are the key to national competitiveness. Income per capita and the extent of export that is governed by factor endowment (WEF captures this by looking at the ratio of primary product export in total export) are two criterions for classifying countries into stages of development. Poor countries or countries that most of their exports are primary products are classified to be in the factor-driven stage. In order to achieve high productivity growth, countries in this

[9] Still, there is no consensus among economists about the significant of most potential growth determinants as well as i) their quantitative affect on economic growth and ii) channel(s) of their affect on economic growth. See discussion in Durlauf, Johnson, and Temple, 2004).

Table 2: Components of Global Competitiveness Index of WEF

Group of key factors	12 Pillars
Key for Factor-driven economies	1) Institutions 2) Infrastructure 3) Macroeconomic stability 4) Health and primary education
Key for Efficiency-driven economies	5) Higher education and training 6) Goods market efficiency 7) Labor market efficiency 8) Financial market sophistication 9) Technological readiness 10) Market size
Key for Innovation-driven economies	11) Business sophistication 12) Innovation

Source of categorization: the Global Competitiveness Report 2007-2008 of WEF

stage must have strong *macroeconomic fundamentals* (which are good institutions, good infrastructure, educated and healthy workforce and stable macroeconomic environment). As economies in the factor-driven stage develop (i.e. income per capita increases), cheap inputs and comparative advantage can no longer be the key to national competitiveness (since inputs will no longer be cheap). The new engine for economic growth in the next stage, which is the efficiency-driven stage, is the efficiency in the production practices. At this stage, countries aim at transforming resources into goods and services using foreign technology *more efficiently*. To achieve this, countries need to have i) higher educated workforce, ii) efficient labor market, iii) efficient and expanded (through international trade) goods market, iii) sophisticated financial market, and iv) greater ability to absorb foreign technology efficiently. Finally, once countries move away from the efficiency-driven stage and toward the innovation driven stage (again as income per capita increases), foreign technology can no longer remains an engine for sustained economic growth. Countries need to develop better products and production techniques *by themselves* through the process of *innovation*. In constructing the national

competitiveness index, WEF assigns weights differently according to countries' stage of development.[10] We summarize this in table 3.

Table 3: Weights for different stages of development

Stages	Factor-driven factors: (pillars 1 to 4)	Efficiency-driven factors: (pillars 5 to 10)	Innovation-driven factors: (pillars 11 to 12)
Factor-driven stage	60%	35%	5%
Efficiency-driven stage	40%	50%	10%
Innovation-driven stage	20%	50%	30%

Source: the Global Competitiveness Report 2007-2008 of WEF.

Finally, the third principle in the Global Competitiveness Index is the assumption that countries *move smoothly* (rather than abruptly) through stages of development. To accomplish this, countries in transition have their weights changed smoothly from one stage to the next (see figure 1 to 3). This approach also highlights that countries *need to be prepared* for the next stage of their development. For example, a country that relies on cheap labor in their competitiveness must recognize that, as the country develops, cheap labor will no longer remain the main source of competitiveness. The smooth transition methodology penalizes countries that do not prepare for the next stage of their development.

2.3: The national competitiveness of IMD

Since 1989, IMD has published their national competitiveness index in their annual World Competitiveness Yearbooks. The construction of IMD national competitiveness index is relatively straightforward and based on the 4 factors model.[11] The four factors are i) economic performance, ii) government efficiency, iii) business efficiency, and iv) infrastructure. These 4 factors capture "the ability of nations to create and maintain an environment, which sustains the competitiveness of enterprises … in

[10] Note that weighting scheme adopted in the Global Competitiveness Index has changed overtime. We report the most recent one which is used in their 2008-2009 publication.
[11] Before 2001, IMD uses 8 factors model. The following are 8 factors; domestic economy, internationalization, government, finance, infrastructure, management, science and technology, and people. Since 2001, IMD has changed their methodology and use the 4 factors model.

their ability to compete domestically and internationally" (IMD, World Competitiveness Yearbook).

Each of the four factors composes of 5 sub-factors. In total, there are 20 sub-factors and each is assigned a 5% weight (in the competitiveness index). We present the 4 factors and their associated sub-factors in table 4. Finally, note that, each sub-factor contains many criterions and the number of criterions in each sub-factor does not have to be the same (thus, each criterion can be assigned different weight in the IMD national competitiveness index). In World Competitiveness Yearbook 2008, more than 300 criterions are used in the construction of national competitiveness index of IMD. Therefore, the construction of national competitiveness index of IMD lies on the principle that the determinants of competitiveness are *many*. This is similar to the first principle of the Global Competitiveness Index of WEF. However, IMD does not classify countries into stages of develop as WEF does (therefore, all countries are assigned the same weighting scheme).

Table 4: Components of national competitiveness statistic of IMD's World Competitiveness Yearbook 2008

Factors	Sub-factors
1) Economic performance (25%)	1.1) Domestic economy (5%) 1.2) International trade (5%) 1.3) International investment (5%) 1.4) Employment (5%) 1.5) Prices (5%)
2) Government efficiency (25%)	2.1) Public finance (5%) 2.2) Fiscal policy (5%) 2.3) Institutional framework (5%) 2.4) Business legislation (5%) 2.5) Societal framework (5%)
3) Business efficiency (25%)	3.1) Productivity (5%) 3.2) Labor market (5%) 3.3) Finance (5%) 3.4) Management practices (5%) 3.5) Attitudes and values (5%)
4) Infrastructure (25%)	4.1) Basic infrastructure (5%) 4.2) Technological infrastructure (5%) 4.3) Scientific infrastructure (5%) 4.4) Health and environment (5%) 4.5) Education (5%)

Source: the World Competitiveness Yearbook 2008 of IMD

3. The big picture

A country with strong national competitiveness is a country that possesses factors that are conducive for sustainable improvement in the well-being of people. In this section, we present the overall national competitiveness of Thailand based on the Global Competitiveness Index of WEF and the World Competitiveness Yearbook of IMD since 2004. In particular, we would like to investigate the followings. First, we present the overall national competitiveness of Thailand and investigate how Thailand performed against the rest of the world and, especially, to major countries in Asia.[12] Second, we investigate whether there are any major discrepancies between the two providers of the national competitiveness ranking?

How Thailand performed against the rest of the world? Thailand is ranked 34th (out of 134 countries) in 2008 and 27th (out of 55 countries) in 2008 according to the Global Competitiveness Index of WEF and the World Competitiveness Yearbook of IMD by order. National competitiveness scores and rankings from the Global Competitiveness Index of WEF and the World Competitiveness Yearbook of IMD among selected countries are shown in table 5 below. It might seem that Thailand performed relatively well when looking at the ranking from WEF (i.e. 34 out of 134) rather than IMD (i.e. 27 out of 55). However, countries that are included in IMD's ranking are relatively restricted (due to their emphasis on hard rather than soft data as discussed in section 2). Countries included in IMD's ranking are mostly developed and emerging countries. Therefore, among the developed and emerging countries, the position of Thailand's competitiveness is somewhat at the middle tier. However, when we compare to a broader group of countries (which includes developing and least developed countries), Thailand's competitiveness position is relatively good.

[12] To effectively conduct a comparison analysis, it is necessary to restrict our attention to a small set of countries. However, our choice of focused countries is extensive enough. First, we include all Southeast Asia countries: that is all close neighbors of Thailand which is of great interest to Thai policy makers and businessmen. Second, additional countries are added so that we have countries to represent all three stages of development categorized by the WEF (see chapter 1.1 of the Global Competitiveness Report 2007-2008 page 9). The three stages of development have already been discussed in section 2 of this paper.

How Thailand performed against major Asian countries? Both rankings from WEF and IMD indicate that Singapore, Japan, Hong Kong, Malaysia, and China have greater level of national competitiveness than Thailand while India, Indonesia, Vietnam, Cambodia, and Philippines have lower level of national competitiveness than Thailand. The only case that WEF and IMD rankings are in contradiction with each other (for selected countries in table 5) is for South Korea. WEF assigns *greater* level of national competitiveness to South Korea when compared to Thailand while IMD assigns the opposite. The different presented here reflects the different in the methodology adopted by WEF and IMD.

Table 5: National competitiveness scores and rankings in 2008 and 2008

Countries	GDP per capita in 2007 (PPP $)	WEF 2008		IMD 2008	
		Scores	World Ranking	Scores	World Ranking
USA	43,227	5.74	1	100	1
Singapore	47,488	5.53	5	99.33	2
Japan	31,607	5.38	9	70.03	22
Hong Kong	39,953	5.33	11	94.96	3
S. Korea	23,363	5.28	13	58.88	31
Malaysia	12,631	5.04	21	73.2	19
China	5,046	4.7	30	73.76	17
Thailand	**7,682**	**4.6**	**34**	**63.1**	**27**
India	2,599	4.33	50	60.62	29
Indonesia	3,519	4.25	55	41.52	51
Vietnam	2,454	4.1	70	Na	Na
Philippines	3,219	4.09	71	50.48	40
Cambodia	1,701	3.53	109	Na	Na

Sources: the Global Competitiveness Index 2008-2009 of WEF and the World Competitiveness Yearbook 2008 of IMD. The scores from WEF ranges from 1 to 7 (1 = worst outcomes and 7 = best outcomes in terms of national competitiveness) and scores from IMD ranges from 0 to 100 (0 = worst outcomes and 100 = best outcomes in terms of national competitiveness). There are 134 economies included in the Global Competitiveness Index 2008-2009 of WEF while there are 55 economies included in the World Competitiveness Yearbook 2008 of IMD. Data for GDP per capita is from the World Development Indicator. GDP per capita is adjusted for purchasing power parity (PPP) and inflation (in constant 2005 international dollars).

The above paragraph indicates just one example of discrepancy between WEF and IMD's rankings. Other examples can also be illustrated (we will show only some of

them). Japan is ranked above Hong Kong and Malaysia according to WEF but it *is the opposite* according to IMD. South Korea is ranked above Malaysia, China and India according to WEF but it *is the opposite* according to IMD. In this regards, the different in the ranking methodology will play a significant role, in particularly for *small to moderate deviation* in ranking results where care and cautious must be used in interpreting the ranking results.

Given the above discussed relative position of national competitiveness among selected countries, it would be interesting to investigate how these positions have been changed (or not have been changed) over the past few years. National competitiveness ranking in 2004 to 2008 (now, among the selected countries) from the Global Competitiveness Index of WEF and the World Competitiveness Yearbook of IMD are reported in table 6 and 7 by order.

Table 6: WEF National competitiveness scores and rankings (among selected countries)

Countries	WEF 2004		WEF 2005		WEF 2006		WEF 2007		WEF 2008	
	Scores	Ranking (among 12 countries)	Scores	Ranking (among 12 countries)	Scores	Ranking (among 13 countries)	Scores	Ranking (among 13 countries)	Scores	Ranking (among 13 countries)
USA	5.21	1	5.85	1	5.61	2	5.67	1	5.74	1
Singapore	4.85	2	5.67	2	5.63	1	5.47	2	5.53	2
Japan	4.79	4	5.50	3	5.60	3	5.43	3	5.38	3
Hong Kong	4.81	3	5.35	4	5.46	4	5.37	5	5.33	4
S. Korea	4.38	6	5.28	5	5.13	5	5.4	4	5.28	5
Malaysia	4.47	5	5.03	6	5.11	6	5.1	6	5.04	6
Thailand	**4.17**	**8**	**4.59**	**7**	**4.58**	**7**	**4.7**	**7**	**4.60**	**8**
China	4.20	7	4.26	9	4.24	10	4.57	8	4.70	7
India	4.07	9	4.32	8	4.44	8	4.33	9	4.33	9
Indonesia	3.92	10	3.96	10	4.26	9	4.24	10	4.25	10
Vietnam	3.68	11	3.91	12	3.89	12	4.04	11	4.10	11
Cambodia	Na	Na	3.20	13	3.39	13	4.04	12	3.53	13
Philippines	3.55	12	3.93	11	4.00	11	3.99	13	4.09	12

Sources: the Global Competitiveness Index in the Global Competitiveness Report 2004-2005 to 2008-2009 issue of WEF

Table 7: IMD National competitiveness rankings (among 11 selected countries)

Countries	IMD 2004	IMD 2005	IMD 2006	IMD 2007	IMD 2008
USA	1	1	1	1	1
Singapore	2	3	3	2	2
Japan	5	4	4	6	6
S. Korea	9	7	9	8	9
Hong Kong	3	2	2	3	3
Malaysia	4	6	6	5	5
Thailand	**7**	**5**	**8**	**9**	**7**
China	6	8	5	4	4
India	8	9	7	7	8
Indonesia	11	11	11	11	11
Philippines	10	10	10	10	10

Sources: the World Competitiveness Yearbooks 2008 of IMD. Note Vietnam and Cambodia are excluded since they never have been included in IMD ranking

Both rankings from WEF and IMD indicate that Singapore, Japan, Hong Kong and Malaysia *always* have greater level of national competitiveness than Thailand while India, Indonesia, Vietnam, Cambodia, and Philippines *always* have lower level of national competitiveness than Thailand. Again, the contracting stories happen for South Korea. It is interesting to note that China has always been ranked as a better performer than Thailand in terms of national competitiveness since 2004 according to the IMD's ranking and has *recently* been ranked as a better performer than Thailand since 2008 according to the WEF's ranking. China's national competitiveness score has increased from 4.20 in 2004 to 4.70 in 2008 according to the WEF's score. For other major Asian countries, we can see that the relative rankings are quite stable over 2004 to 2008 period.

The overall national competitiveness of Thailand is somewhat at the middle range among developed and emerging countries (which include most of major Asian countries). However, when comparing against a broader group of countries, Thailand's competitiveness is in a good position. In the past few years, there was a moderate improvement in the national competitiveness of Thailand in 2004 to 2006. However, we experienced the opposite since 2007. China has outperformed Thailand in terms of national competitiveness from both rankings from WEF and IMD in 2008. For other major Asian countries, the relative rankings (among themselves) are quite stable.

How would we improve our rankings? To understand how to do this, we identify important strengths and weaknesses of Thailand. Important strengths and weaknesses are identified based on two criterions. First criterion is the "weight" of each factor in the national competitiveness score (in another word, we focus on strengths and weaknesses that are *important*). Factors that receive high weight can have greater impact on the national competitiveness score than factors that receive low weight from an equal change of these factors' score. It is important to note that WEF does not assign equal weight to each pillar (as we have discussed in section 2) while IMD assigns equal weight to each sub-factor (see table 4). The rational behind the weighting scheme of WEF have already been discussed in section 2. Second criterion is the *ranking* of each factor. Factors that are ranked relatively bad (for the national competitiveness score) are the weaknesses while factors that are ranked relatively good (for the national competitiveness score) are the strengths. Finally, it is important to note that the validity of strengths and weaknesses that we identify below lies critically on the validity of the methodologies in quantifying the national competitiveness statistics. We have mentioned at the beginning that the methodology in quantifying the national competitiveness is far from perfect. In section 5, we discuss the limitations of national competitiveness statistics. Table 8 presents important strengths and weaknesses of Thailand based on the Global Competitiveness Index of WEF in 2008 and the World Competitiveness Yearbook of IMD in 2008.

Table 8: Important strengths and weaknesses identified from the Global Competitiveness Index of WEF in 2008 and the World Competitiveness Yearbook of IMD in 2008.

	WEF	IMD
Important strengths	Labor-employer relations (17^{th}, weight = 8.5%) Market size (21^{st}, weight = 8.5%) Infrastructure (29^{th}, weight = 10%)	Labor market (3^{rd}) Employment (4^{th}) Price (4^{th}) Fiscal policy (5^{th})
Important weaknesses	Health and primary education (58^{th}, weight = 10%) Institutions (57^{th}, weight = 10%) Technological readiness (66^{th}, weight = 8.5%)	Domestic economy (48^{th}) Productivity (48^{th}) Health and environment (47^{th}) Technological infrastructure (43^{rd}) Education (43^{rd}) Institutional framework (40^{th}).

Note: For IMD, weights are all equal to 5 percent. All criterions that do not appear as important strengths in table 8 do have worse ranking performance while all criterions that do not appear as important weaknesses in table 8 do have better ranking performance Still the weight scheme do play an important role in WEF methodology. This will be more obvious when discussed future vs. present strengths and weaknesses.
Source: the Global Competitiveness Report 2008-2009 of WEF and the World Competitiveness Yearbook 2008 of IMD

In conclusion, important strengths and weaknesses identified from WEF and IMD data are somewhat consistent. The strengths of Thailand lie in its big market size, strong labor market conditions and good infrastructure system. However, the weaknesses of Thailand lie in its poor health-related factors, technological readiness, and institutions. [13] These are the areas that will be addressed in section 4 to provide valuable information in formulating a preliminary guideline for promoting Thailand competitiveness with the goal to improve the well-being of Thai people.

4. Recommendations

In order to *maintain* the national competitiveness of Thailand, Thailand should *maintain its important strengths*.[14] In addition, it is important for Thailand to *overcome its important weaknesses*. Below, we mostly rely on the subcomponents of pillars that we identified as important strengths and weaknesses from WEF data. Relatively, similar conclusion is reached when we focus on subcomponents in IMD data. It is important to recognize that the recommendations we suggested below are for guiding resources allocation. It is true that all factors that have positive contribution to the national competitiveness are valuable. However, *how much they are valuable* at present and in the future can be vary. Furthermore, it is also important to recognize the interrelationship between factors. It is likely that a change in one factor cannot be done without holding every other factor constant in reality. The interrelationship between factors needs further investigation in the future. In sum, designing policy needs to recognize these two important points.

[13] Note that all factors, except market size and (physical) infrastructure that show up as important strengths and weaknesses of WEF also the important strengths and weaknesses from IMD data.
[14] In particular, important strengths at present that will remain important strengths in the future.

Maintaining large market size

- Thailand is ranked 23rd and 18th in its domestic and foreign market size (two components of market size pillar) in 2008 from WEF data by order.[15] This simply reflects the fact that Thai economy is relatively big with both large domestic and foreign market. Regarding the market size, we think that the export sector of Thailand which has been an important contributor in the gross domestic product (GDP) in the past is needed to be an important contributor in the future. In 2007, the share of export in GDP of Thailand is approximately *73 percent* according to the Office of The National Economic and Social Development Board (NESDB).[16] Therefore, it is important to maintain the competitiveness of Thai firms so that they are able to compete in the international market. Maintaining the quality and the reliable of Thai products will be important.[17] At present, maintaining the quality and reliability of Thai products is difficult since there are many different agencies responsible for these which lead to "duplication of effort, lack of uniformity, and adoption of standards that are not fully in line with international practices" (from "Modernization of Thai Standardization System", Thailand Industrial Standards Institute (TISI), Ministry of Finance). TISI has suggested 4 areas that need to be improved which are i) set up "national standards and conformity assessment framework", ii) setup "network" so that all agencies involved can participate and communication efficiently, iii) improve infrastructure (for infrastructure that is important for maintaining the quality and the reliability of Thai products), and iv) promote implementation of national

[15] Domestic market size is the sum of the value of GDP and import while foreign market size is the value of export.
[16] Recall the national income identity which is GDP = C + I + G + X – M. According to NESDB, private consumption (C) is about 53 percent of GDP, general government consumption (G) is about 13 percent of GDP, gross fix capital formation (or simply fixed investment or I) is about 27 percent of GDP and import of goods and services (M) is about 65 percent of GDP. Let X denotes export. Then, we can see that only 28 percent of goods and services that have been produced domestically are consumed domestically (i.e. 53 + 13 + 27 – 65 = 28). This clearly shows the important of export market in Thailand.
[17] There is an extensive body of research of the export-led growth (ELG) hypothesis. Awokuse (2006) applied causal search algorithms to study the relationship of export and growth in the structural vector autoregression (SVAR) context. He found significant bi-directional relationship between export and growth (i.e. export significantly causes growth and vice versa). See Awokuse (2006) for more review of ELG hypothesis literature.

standards. We think that the recommendations from TISI will be important for maintaining large and vibrate export market for Thailand in the future. Furthermore, several other approaches to enhance the competitiveness of Thai firms will be discussed more below (see discussion on innovation).

Maintaining high labor market efficiency

- Thailand attained high labor market efficiency from the high degree of cooperation in labor-employer relations (ranked 17th according to WEF), low non-wage labor costs (ranked 20th according to WEF), and low rigidity of employment (ranked and 21st according to WEF) in 2008. These are 3 key components of labor market efficiency pillar in which Thailand performed well in 2008 according to WEF. Confrontation between employers and employees (i.e. non-cooperative relationship) can reduce productivity of firms (i.e. the resources wasted on court activities) and national competitiveness. Non-wage labor costs are payments other than salary to employees such as retirement fund, sickness, family allowance, etc. Non-wage labor costs do not *directly* provide incentive for employees to exert greater effort and thus do not *directly* enhance productivity. Rigidity of employment captures rigidity in hiring, rigidity in hours of work and rigidity in firing. Again, greater flexibility of employment can be argued to be productive since it can be the basis for firms to encourage employees to exert greater effort (either by working more or working better). Nickell (1997) investigated the features of labor market that are responsible for higher long-term unemployment (i.e. inefficiency in the labor market). He concludes that *only some* features of labor market are responsible for high long-term unemployment. In particular, it is i) unemployment benefits that have *indefinite duration* and/or very little incentive to encourage unemployed people to reenter labor market, ii) high unionization with *no-coordination* particularly between employers (i.e. when each employer negotiate wage with each union separately), iii) high overall tax on labor, and iv) poor educational standard particular at “the bottom end”. While, strict employment protection (to promote fair treatment of employees), unemployment

benefits with definite duration or great incentive for people to reenter labor market, and high unionization with *coordination* between employers. Furthermore, appropriate use of non-wage labor costs and strict employment protection (i.e. rigidity of employment) might enhance productivity *indirectly*. For example, it is true that retirement fund and sickness allowance are payment that do not *directly* relate to productivity. However, they might have *indirect effect* on productivity such as improve attitude toward work and encourage employees to stay with the current employment longer. Therefore, appropriate and greater use of employment protection (to encourage fair treatment of employees), unemployment benefits (with definite duration and incentive to encourage unemployed people to reenter the labor market, encouraging *fair* coordination between employers in negotiating wages with unions, and enhance educational standard particular at "the bottom end" of the labor market will be useful for maintaining high labor market efficiency.

Maintaining good (physical) infrastructure system

- The overall infrastructure of Thailand is ranked at 35th according to WEF. In particular, Thailand ground transportation (ranked at 32nd according to WEF) and air transportation (ranked at 28th according to WEF) are ranked relatively good among a broad group of countries according the WEF data in 2008. Physical infrastructure has been found to have significant positive relationship with productivity and economic growth (for example, Easterly and Rebelo, 1993 and Canning *et al*., 1994). Esfahani and Ramirez (2003) argued that after appropriate statistical analysis (taking into an account the simultaneity between physical infrastructure and economic growth), they found that physical infrastructure has substantial impact on economic growth. However, another important finding from their work is that physical infrastructure has substantial impact only when appropriate institutional framework is in place. This provides another reason for the need to improve the institutions of Thailand. Regarding the physical infrastructure of Thailand, it will be important for Thailand (particular, Thai

government) to maintain the existing quantity and quality of physical infrastructure. This does not imply that we do not need more roads (and other physical infrastructure). However, Thailand needs to expand the existing physical infrastructure *relative to* its economic activities. Some areas need much further improvement. In particular, the physical infrastructure that will be important to overcome health-related problems and the lack of technological readiness of Thailand (see discussion below) need much improvement.

Overcoming fundamental institutional problems

- For institutions, areas that Thailand performed exceptionally poorly are business cost of terrorism (ranked at 107th according to WEF), reliability of police services (ranked at 71st according to WEF), and ethical behavior of firms (ranked at 69th according to WEF). The business cost of terrorism is mostly related to the unrest in the southern provinces of Thailand which greatly affects the *overall* cost of terrorism to business and should be one of many urgent issues that Thai government needs to deal with. Still, there are 5 other areas in institutions pillar that are ranked no less than 60th place: property right (61st according to WEF), public trust in politicians (64th according to WEF) transparency in government policy making (60th according to WEF), organized crime (63rd according to WEF), and efficacy of corporate boards (66th according to WEF). In sum, there are many weaknesses in Thailand's institutions.[18] The literature on institutions as determinants of economic growth is extensive.[19] A significant body of research found a significant positive relationship between institutions and economic growth. For example, works of Hall and Jones (1999) on "social infrastructure" (which is constructed from two indexes; i) anti-diversion index and ii) openness

[18] Nelson and Sampat (2001) reviewed literature on institutions in economics and argue that researchers adopt different definition of institutions which are at least i) "rules of the game", ii) "widespread habits of action", iii) "governing structures", iv) "cultural beliefs and norms" and v)"the way the game is played". More research (and discussion) is needed for greater consensus on what should be the appropriate definition of institutions.

[19] To name a few influential papers on this topic, these include Hall and Jones (1999), Acemoglu, Johnston and Robinson (2001), Easterly and Levine (2001), Barro (1999), Knack and Keefer (1995) and Mauro (1995)).

index), Barro (1999) on democracy, Knack and Keefer (1995) on social capital and Mauro (1995) on corruption. However, improving institutions is a serious and difficult task which, at best, can be accomplished only gradually overtime. Therefore, this requires a significant long-term commitment from government as well as private sector. We have three suggestions for improving institutions. First, improving education (both basic and higher education) will be important basis for improving institutions. Second, Thailand needs to increase transparency in government policy making. Because government officials have discretion in their policy making, individuals have incentive to bride them in order to influence their policy making. However, greater transparency will reduce the incentive of both the giver and the taker. Third, we need to fundamentally enhance the "morality" of Thai people. For this, applying the sufficiency economy philosophy will be of great value. However, there are still difficulties in applying the sufficiency economy philosophy. First, improving institutions (from applying the sufficiency economy philosophy) will be a long-term project which will last longer than the period of any government. Therefore, we need to have an independent agency who will receive full support from every governments and is responsible for improving the quality of institutions in Thailand. Second, it is still difficult to measure the quality of institutions; particularly for Thailand. This makes it difficult to monitor the process of improving the quality of institutions. Thus, we need to set up a task force for developing a procedure to measure and monitor the quality of institutions in Thailand. With appropriate measuring and monitoring, improving the quality of institutions in Thailand will be more plausible.

Overcoming the severe health-related problems

- For health and primary education, it turns out that Thailand performed exceptionally poor in health related matters. For example, situations on HIV (108^{th} according to WEF), Malaria (93^{rd} according to WEF), and Tuberculosis (96^{th} according to WEF) are among the bottom tier in the world. Human capital is an important determinant of economic growth (and thus, productivity). Health can

be considered as a part of human capital. Bloom, Canning and Sevilla (2004) summarize the empirical findings of 13 studies on health and economic growth (see their table 1). 10 out of 13 studies report positive and statistically significant effect of health on long-term economic growth. Furthermore, health is virtually recognized as a key determinant of people well-being (or their welfare). Therefore, it is important for Thailand to overcome its current health-related problems. As discussed above, the most severe areas that need significant improvement are the conditions on HIV, Malaria and Tuberculosis. We suggest that Thai government, along with health experts both from local and international, initiate a campaign in order to improve these conditions in all parts of Thailand as fast as possible.

Overcoming the lack of technological readiness problem

- For technological readiness, areas that Thailand performed exceptionally weak are broadband internet subscribers (94th according to WEF), internet users (78th according to WEF), personal computers (72nd according to WEF) and mobile phone subscribers (72nd according to WEF). For Thailand, the broadband internet subscribers per 100 population score is just 0.2 and personal computers per 100 population score is 6.9. These scores are significantly low in comparison with some advanced countries in Asia (Singapore 18.3 and 72.6 and Japan 20.6 and 40.8). This is also low when we look at the scores in more developed neighbor country like Malaysia (3.5 and 23.4). These criterions should be viewed as capturing the extent of the availability of "general purpose technology". General purpose technology provides a platform for adopting foreign technology. Technological differences have been shown to explain much of the variation in productivity between countries and considered to be one of the most important factors for the competitiveness of nations (Fargerberg, Srholec and Knell, 2007). In addition, general purpose technology does enhance future innovation. A well-developed ICT infrastructure is widely acknowledged as a must for innovation

(Fargerberg, Srholec and Knell, 2007). Recommendations on promoting innovation readiness will be discussed more below.

Nevertheless, the above recommendations are likely to be insufficient in the future. The reason is that the nature of Thailand's competitiveness will slowly changed in the next 10-20 years. In particular, as Thai economy develops, factors that used to be important strengths of Thailand today might not remain to be important strengths of Thailand in the future. The methodology of WEF strongly emphasizes the need to rely on innovation (pillar 12) as the main engine for advanced economy. For Thailand, it is important to be ready for this.

Promoting innovation readiness

Talent (human dimension of innovation): The human dimension of innovation, including knowledge creation, education, training and workforce support, has been recognized as one of the most significant factors.

- Producing capable talents is a key to enhance innovation. Policy makers should ensure that policies and activities intended to support initiatives focus on developing basic and higher education system. Basic education will be quite important as the basis for having *mindsets* that are conducive for innovation (such as entrepreneurship). Higher education, on the other hand, will be important for the technical side of innovation. The shortage of skilled workers has become an issue in Thailand as well as in other countries.[20] University has to play an important role in creating innovative culture at all levels. University should

[20] According to THES-QS ranking in 2008, only Chulalongkorn University (166th), Mahidol University (251st) and Kasetsart University (400th) were ranked in the top 400 universities around the world. We suggest that faculty performance be evaluated based upon the quality of teaching and research. The teaching quality could be evaluated by a class evaluation and a student exit survey. The research quality could be evaluated by a number of peer reviewed journal articles produced each year by faculty, for example. In other words, we encourage the use of various objective evaluations, instead of subjective evaluations. In order to do so, universities should have more flexibility and be disciplined by competition. This can be done by giving greater autonomy to universities to manage their own teaching and evaluation strategies, hiring strategies, or even pay scales (World Bank and Office of the National Economic and Social Development Board, 2007).

provide students with opportunities to explore open-ended problems, engage in teamwork, and work on projects that cross traditional disciplines. Scholarship can be used to attract more capable students. Government (by collaborating with private sector and foundations) should be the main initiator.

- The shortage of skilled workers has become an issue in Thailand as well as other countries. We believe that this issue is linked to the quality of teaching and research, and the spending on training by organizations. The former, we recommend that the teaching and research standard be set at a high level in major universities, and strictly followed. The latter, we recommend that skills development be promoted and encouraged in organizations (e.g., personal development activities). Moreover, we encourage organizations to continuously provide trainings designated to computer & IT and English to their employees at all levels, as these areas are often marked as being short in supply by most Thai employers (World Bank, 2006).

- Immigration policy and work permission need to reconsider for avoiding capable human resource outflow and attract capable individuals to work in Thailand. In addition, government should aware the importance of improving current work environment in industry. This can be improved by expanding career-long opportunities for education and training (include on-the-job training) education and on-the-job training and given the increasing "fluidity of employment," developing new ways of treating health insurance and pension plans (National Innovation Initiative Summit and Report, 2005).

Investment (the financial dimension of innovation): It is important to seek to increase the flow of private capital to innovation to support frontier research as well as from public found. This requires a shift in the mindset of corporate and financial executives away from exclusive focus on short-term performance to increase intellectual capital or invisible asset which enhances long-term sustainable growth.

- Tax policies can be used to create a more attractive environment for investment in R&D.

- Universities and industries have been engaged in business and research collaborations for centuries. And they continue to pursue one another because both benefit from research outcomes especially competitive advantages that help insuring their institution's growth and business's survival. Unfortunately, the benefits might not have been seen by a lot of business and universities in Thailand. Therefore, it is important to raise awareness of the collaboration in universities and business, and at the same time to encourage organizations across industries to participate more in research with universities. We suggest that more internship programs or post-graduate programs designated to research areas be created to strengthen the relationships between the business sector and key universities. At the same time, more research centers at major universities should be built through university-industry collaborations.

Infrastructure (the physical dimension of innovation): It is important to improve the physical infrastructure that is conducive for innovation.

- A well-developed ICT. A well-developed ICT infrastructure is widely acknowledged as a must for innovation and some studies explained that technology competitiveness is related to the innovation of a country (Fargerberg, Srholec and Knell, 2007). When we look at the score of Thailand in WEF report, the broadband internet subscribers per 100 population score is just 0.2 and personal computers per 100 population score is 6.9. These scores are significantly low in comparison with some advanced countries in Asia (Singapore 18.3 and 72.6 and Japan 20.6 and 40.8). This is also low when we look at the scores in more developed neighbor country like Malaysia (3.5 and 23.4). Some other factors such as firm-level technology absorption, laws relating to ICT, mobile phone and Internet users are also relatively weak area. We suggest that these

fundamental ICT be provided and these skills be encouraged to learn in their education and training program.

- Numerous knowledge and new technologies are often generated through R&D especially in the private sector, which is the dominate force in manufacturing and business service. Despite its importance, R&D spending in Thailand, according to the World Bank and Office of the National Economic and Social Development Board Report (2007), has been relatively low comparing to other nations in East Asia. Therefore, organizations in both the public and private sectors should support innovative activity and build an environment that is conductive to such activity. We suggest that new technologies be acquired, more competitive environments be built in organizations, and more training and incentives, either financial or motivational, be provided to stimulate the launch of new ideas among employees.

- Even though many government programs to encourage R&D, technology absorption and technology development have so far failed to produce the desired effect, it is crucial for Thai's government to continue their efforts and work with the private sector to maximize the economy's potential for innovation (World Bank and Office of the National Economic and Social Development Board, 2007). We suggest that the subsidization or the funding by the government be increased for research facilities and for basic research at universities. As indicated in the World Bank and Office of the National Economic and Social Development Board 2007 Report, the contribution could include grants for specific programs for leading universities or research institutes, or scholarships for science, math and engineering studies for both Thai and foreign students as is already being done in Singapore.

- The high quality of science base is often pointed out as a platform on which innovation activities to some extent depend. To enhance innovation, we suggest that more science parks that are fully equipped with advance facilities (e.g., R&D

laboratories, incubation centers), and are in adjacent to the selected universities and/ or major transportation systems be constructed. Of course, this requires massive investments and cannot be done overnight. Thus, alternatively, building multiple smaller science parks should be considered. Regardless of the size, science parks should be viewed as service organizations providing a range of business support facilities to innovation-based organizations in Thailand (Kihlgren, 2003).

5. Limitations

The methodology in quantifying the national competitiveness is far from perfect. In section 2, we have discussed about the definition of national competitiveness, which still remains elusive and controversial. Still, major progress has happened in recent years and some consensus has emerged (see section 2). The methodologies used in quantifying the national competitiveness have greatly benefited from research in economic growth literature (see Levine and Renelt, 1992 and Sala-i-Martin, 1997a, 1997b), Hoover and Perez (2004) Fernandez, Ley and Steel (2001), Durlauf, Johnson, and Temple, (2005), Doppelhofer, Miller, and Sala-i-Martin (2004) and Hendry and Krolzig (2004) for discussion on growth regression literature). However, it is obvious that the methodologies adopted by WEF and IMD are not as *rigorous* as what have been proposed in the economic growth literature. The reason for this (even though both WEF and IMD do not mention this explicitly) is to make the reports *accessible* to the general audiences. It is still unclear how the trade-off between rigorousness and accessibility should be managed. Furthermore, the validity of the national competitiveness statistics as well as our recommendations lies in the validity of the underlying assumptions assumed. WEF and IMD *might not* capture all *variables* that are the determinants of productivity or wealth. WEF and IMD do not explicitly taking into an account the possibility of interrelationships between variables. Furthermore, some variables might have negative

relationship (so improve one might make another one worse).[21] Finally, some data used in WEF and IMD is considered to be "soft data" which are subjective. It is still unclear what should be the standard for the "soft data". Future research needs to address these issues. In sum, the recommendations that we gave should be interpreted and viewed as educated suggestions.

6. Conclusion

Competitiveness of nations has been a topic that receives a growing attention among businessmen and policy markers worldwide. In this paper, we rely on the national competitiveness statistics from the Global Competitiveness Reports of WEF and the World Competitiveness Yearbooks of IMD to evaluate the overall competitiveness of Thailand against the rest of the world and, especially, to major countries in Asia. Furthermore, subcomponents of the national competitiveness statistics are used to evaluate areas that are important strengths and weaknesses of Thailand. Even though both WEF and IMD do adopt (slightly) different definition of the national competitiveness and (significantly) different approach in quantifying the national competitiveness, the conclusions and recommendations for *Thailand* (i.e. this might not be the same for other countries) that we drew are quite similar. It needs to be recognized that the methodology in defining and quantifying the national competitiveness is far from perfect. Future research needs to address these issues.

For overall competitiveness, Thailand is ranked 34th (out of 134 countries) in 2008 and 27th (out of 55 countries) in 2008 according to the Global Competitiveness Index of WEF and the World Competitiveness Yearbook of IMD by order. It is worth to note that the country of coverage in IMD ranking is relatively restricted (mostly developed and emerging countries) while in WEF ranking is much broader. Given this, the position of Thailand's competitiveness is somewhat at the middle tier among the

[21] For example, in least developed countries, it is important to violate international intellectual property right agreement and produce some drugs from HIV disease locally. Thus, greater property right might come at a cost of people life.

developed and emerging countries. However, when we compare to a broader group of countries, Thailand's competitiveness position is at the top tier.

Relying on the subcomponents of the national competitiveness statistics, we identify important strengths and weaknesses of Thailand. The strengths of Thailand lie in its big market size, strong labor market conditions and good infrastructure system. However, the weaknesses of Thailand lie in its poor health-related factors, technological readiness, and institutions. In order to improve the current level of Thailand national competitiveness, important strengths should be maintained and important weaknesses should be overcome. It is worth to note here that strengths and weaknesses of any countries are dynamic rather than static in nature (as emphasized in the methodology of WEF). In particular, as Thai economy develops, factors that used to be important strengths of Thailand *at present* might not remain as the important strengths of Thailand *in the future*. The methodology of WEF strongly emphasizes the need to rely on innovation as the main engine for advanced economy. For Thailand, it is important to *start recognizing the important* of talented human resource, investment in R&D, and technological infrastructure. In the future, these factors are needed to be gradually improved since they will be important components of Thailand economic growth engine.

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