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Assessing potential of power generation investment in ASEAN countries

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Abstract

The Association of Southeast Asian Nations (ASEAN) has been considered as one of the attracting regions for foreign direct investment. As developing nations are growing, they tend to consume more electricity and need more power generation, which becomes one of attractive businesses in this region. However, not many studies focus on an assessment of business environment of power generation and might deter unfamiliar investors from venture. Therefore, we assessed the relative attractiveness of power generation investment in this region in five aspects: economy, business, risk, infrastructure, and finance, which were taken up from the framework of the Global Infrastructure Investment Index. The assessment can provide an overview of strengths and weaknesses of power generation investment and serve as guidelines for investment decisions and policy making to investors and government in each ASEAN country.

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Keywords: ASEAN; Business environment; Power generation investment

1. Introduction

The ASEAN, which comprises of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, has been identified as one of the fastest developing regions in the world, and by an establishment of the ASEAN Economic Community (AEC), a regional economic integration has been strengthen and brought interests from foreign investors [1]. To support the region's economy growth, the needs for sustainable energy security have become significant and shall be considered when government makes policy [2]-[4]. One of the important contributors that enhance the region's energy security is a private investment, from both domestic and abroad investors. To attract these investors, the region should develop solid guidelines that promote its energy business. Therefore, this study deploys available data to assess attractiveness for power generation investment in ASEAN countries through a quantitative method. The purpose of this work is to preliminarily screen for attractive markets abroad of power generation. Country screening is commonly accepted as the first step in analyzing foreign market entry [5].

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Market attractiveness, as a term found in portfolio analysis and market strategy planning, describes market growth and profit possibilities of an available market or industry; market attractiveness is affected by various factors. According to a number of studies that have investigated the various factors of international expansion [5]-[10], market potential, which depends on the market size, the market growth and the consumer purchasing power, is identified as one powerful factor affecting the market attractiveness. In addition, McKinsey & Company suggests that the most common factors affecting the market attractiveness are growth rate, market size, market profitability, market structure, product life cycle changes, changes in demand, trend of prices, macro environment factors, seasonality, availability of labor, market segmentation [11]. The attractiveness of foreign markets is also involved with economic, political, legal, regulatory, cultural and geographic of that country [5], [9]-[10], [12]. However, key factors that should be included to evaluate market attractiveness depend on company's objectives of such evaluation [11].

To preliminarily assess attractiveness of international market, there are two main complementary approaches: country clustering and country ranking [5]. The former classifies countries in groups according to their similarity of commercial, economic, political, and cultural dimensions, while the later ranks countries from their overall market attractiveness, which is evaluated from different dimensions in respect to the considered market. The details of these two methods have been discussed in [5], [13]. For this study, the method of country ranking is selected because we aim to assess the relative attraction of ASEAN countries to power generation investors.

2. Methods

2.1. Framework

Since power generation business is relevant to infrastructure investment, this study assesses the attractiveness of power generation market under the framework modified from that of the Global Infrastructure Investment Index [14]. This framework focuses on the relative attraction in five aspects: economy, business, risk, infrastructure, and finance. By considering this framework, we chose indicators related to power generation investment under each aspect, and all indicators have the same weight in the assessment. However, due to limited data availability, we selected only twenty indicators which are available for all ASEAN countries from different years (2010-2015), as shown in Table 1. These indicators were used to assess an overall situation of power generation investment in the ASEAN region.

2.2. Data transformation

The assessment was done by using secondary data from national statistics and open source data. We collected the data set of each indicator, and then the data set was normalized on a linear scale of 1-5 as shown in (1).

$$x_i' = 1 + (5-1)\left(\frac{x_i - Min_X}{Max_X - Min_X}\right) \quad (1)$$

where, x_i' is normalized value based on 1-5 scale. x_i is value of the original data set $X = [x_1 \quad \cdots \quad x_i]$. Min_X and Max_X are minimum and maximum value/scale of that original data set X, respectively.

On the other hand, if indicators, such as variation of inflation, difficulty to get electricity, or tax rate, are inversely related with the scale, the reverse normalization can be calculated as shown in (2).

$$x_i' = 1 + (5-1)\left(\frac{x_i - Max_X}{Min_X - Max_X}\right) \quad (2)$$

Table 1. Indicators related to power generation investment for each aspect

Aspect	Code	Indicator	Year	Data source
Economic environment	E-1	Average GDP growth[a]	2010-2014	[15]
	E-2	Gross fixed capital formation	2014	[15]
	E-3	Renewable market size[b]	2012	[16]
	E-4	Electricity market size growth[c]	2010-2012	[16]
Business environment	B-1	Ease of doing business	2015	[15]
	B-2	Government transparency	2012-2013	[17]
	B-3	Legal framework in settling disputes	2012-2013	[17]
	B-4	Electricity market structure[d]	2013	[18]
Risk	R-1	Political stability	2014	[15]