Key Success Factor of Special Economic Zone for Thailand

P. Pakdeenurit, N. Suthikarnnarunai Member, IAENG, and W. Rattanawong

Abstract—The main purpose of this paper is to find out the key factors of the Special Economic Zone(SEZ)'s success by applying the appropriate mathematical model and using 11 variables to analyze in order to get its result. For example, some of the factors are; FDI, GDP, high-technology, R&D, Co² and export. In the beginning, this research was tested in China and India. This same mathematical model will be tested in The USA and Thailand in the near future to guarantee its precision. However, this model shall be tested in some other countries and regions. That to make sure the assumptions and key factors are reliable, suitable and able to support the future area to come.

Index Terms—Special Economic Zone, Key Success Factor, FDI, Mathematical Model, Thailand.

I. INTRODUCTION

Special Economic Zone (SEZ) is the area with a special privilege that is established specifically by any countries in order to attract the foreign business persons in investing in the country. The privilege might include a special investment policy or rule or regulation and special support in infrastructure e.g., a tax break, a financial support, or issuance of work permits for foreign workers. The businesses that have been to promoted under the SEZ includes industry, agriculture, commerce, tourism, services or any other operation supporting a Free Trade Area [1-9].

The Special Economic Zone can be divided into 6 types, which include the Free Trade Zone, Export Processing Zone, Enterprise Zone, Single Factories, Free Port, and Specialized Zone. This section briefly describes the characteristics of each SEZ with other names that might be possible [1], [10-12].

II. WHY HAVE THE SPECIAL ECONOMIC ZONE

The main objective of developing SEZ is to spread out wealth from the main city to different regions throughout the country. This not only helps to enhance the quality of life for people in those regions but also increases its chance of competing in the global arena.

OECD (Organization for Economic Cooperation and Development) is association where countries join hand in hand to develop the SEZ. Their aims are not to improve the SEZ for the purpose of improving the economy, but they rather focus on improving the whole service system. Whereby, they start by eliminating all the rules and regulations that are unnecessary. They also keep track of all the data in electronic forms, where they countries collaborate and share resources. (Service Center) They also make use of new technology to aid their service. Thus, customers are more satisfied with the fast delivery speed. For example, in the case European Union, they utilize Free Trans-bordering of goods, labor and capital so countries in European Union do not have to focus on just trying to improve the economy and focus on improvement the service system instead [2], [13-15].

In most cases, The special economic zone are to established in developing countries, and it is rather difficult. The fact is that these countries are not suitable for SEZ to be established all at once because the process will require more time and effort to do so. The fact is that the world’s economy is changing so drastically, by the time SEZ are successfully to established the special privileges in the SEZ will no longer be effective. So this developing country must focus on development of district zone that made service system can expand around their country in the future [16-17].

We will now observe how countries manage their Special Economic Zones. Let us take a look at the 2 cases below for India and China. India has the most SEZ in the world [18-20]. While, Shenzhen in China was the first to set out successful Special Economic Zones [21-23]. Shenzhen was able to do this because the government has a clear goal of what they wish to improve and to find all the resources needed to do so. It also adapted the westerner’s fast response system to its local regions. Special privileges that they provide in their SEZ include things like reduction in the tax rate, special exchange of currency, and special labor regulations [24-25].

In conclusion, the objective of setting up the SEZ is to stabilize the country and help the country to expand sustainably.

This is sustainable growth includes:
1) Satiability of the economy
2) The spreading effect of cash inflow into different regions throughout the country
3) High performance, knowledge-based, creative economy
III. KEY SUCCESS FACTORS OF THE SPECIAL ECONOMIC ZONE

The establishment of SEZ has limitations that must be realized. Due to it might create a long term impact such as environment pollution, and so on. After reviewing all the data [1-2], [26-27], we see that the key factors to be observed in order for us to judge if that SEZ will be a successful one are listed below.

1) Location advantage
2) Macroeconomics of the country
3) Industrial investment support
4) Investment cost
5) Skilled labor
6) Management and service
7) Government policies
8) Laws and regulations
9) Stability and consistency of the government.

IV. MATHEMATIC MODEL OF SPECIAL ECONOMIC ZONE

The literature reviewed showed the key success factors of the special economy zone by building algebraic equations in which the majority use the variables: FDI, GDP to be the index points of the key success factor of SEZ [28-39]. Then the author wants to build the mathematic model for analysis of the key success factors of SEZ with consideration of another various factors.

A. The procedure studies to analysis.

The literature reviewed showed about 8 key success factor of that special economy zone. We can separate the basic necessities to get 3 main dimensions; international environment, domestic environment, and the role of the state. We have data from World Bank for analysis to support the aforementioned factors [40-41]. As follows.

B. Formulate a Mathematical Model.

To Formulate a mathematical model for use in relationship analysis, with the variables from above, to be able to calculate if SEZ will succeed, we will use the algebraic equation linear Regression and EvIEWS Programming for evaluation [42-44].

From the factors above, the 27 variables listed below will help us utilize the Run Model. This includes air transport, internet users, roads, railway, rail lines, telephone system, mobile cells, high-technology exports, Gross Domestic Product (GDP), Foreign Direct Investment (FDI), claims on central government, urban population, trademark applications, market capitalization, labor force, trade, researchers in R&D, imports, export, Tax on goods and services, tariffs, tax revenue, agriculture, inflation, improved water, electric, and CO2.

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>VARIABLES FOR SEZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent: Foreign Direct Investment (FDI)</td>
<td>Dependent variables</td>
</tr>
<tr>
<td>Key success Factor</td>
<td>Foreign Direct Investment (FDI)</td>
</tr>
<tr>
<td>1. Location Advantage and Macroeconomy of country</td>
<td>Railway, Internet users, roads, telephone system, mobile cells, urban population, improved water,</td>
</tr>
<tr>
<td>2. Industrial investment support</td>
<td>GDP, imports, export, trade</td>
</tr>
<tr>
<td>3. Investment cost</td>
<td>Market capitalization, inflation, labor force</td>
</tr>
<tr>
<td>4. Skilled Labor</td>
<td>High technology, R&amp;D, Electric,</td>
</tr>
<tr>
<td>5. Management and service</td>
<td>Tax on goods, tariff, tax revenue agriculture, Co2</td>
</tr>
<tr>
<td>6. Government policies</td>
<td>Trademark applications</td>
</tr>
<tr>
<td>7. Laws and regulations</td>
<td>Claims on central government</td>
</tr>
<tr>
<td>8. Stability and consistency of the government</td>
<td></td>
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</tbody>
</table>

Fig 1. The procedure analyses the data

Fig 2. The Result of Correlation between 27 variables in the People's Republic of China and the People's Republic of India.
TABLE II

<table>
<thead>
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<tr>
<td>Variable</td>
</tr>
<tr>
<td>FDI</td>
</tr>
<tr>
<td>GDP</td>
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<tr>
<td>Co²</td>
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<tr>
<td>High</td>
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<tr>
<td>Export</td>
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<tr>
<td>Job</td>
</tr>
<tr>
<td>Market</td>
</tr>
<tr>
<td>R&amp;D</td>
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<tr>
<td>Trademark</td>
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</tbody>
</table>

TABLE III

C. Using Mathematical Model to formulate with Linear Regression on Eviews Programming

**TABLE III**

<table>
<thead>
<tr>
<th>The Result of formulate of the People’s Republic of China</th>
</tr>
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<tbody>
<tr>
<td>Dependent Variable: LOG(FDI) -- China --</td>
</tr>
<tr>
<td>Method: Least Squares</td>
</tr>
<tr>
<td>Date: 12/15/13 Time: 01:05</td>
</tr>
<tr>
<td>Sample: 1992 2011</td>
</tr>
<tr>
<td>Included observations: 20</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.55</td>
<td>0.57</td>
<td>0.985</td>
<td>0.141</td>
</tr>
<tr>
<td>LOG(AIRTRAN)</td>
<td>0.25</td>
<td>0.25</td>
<td>0.930</td>
<td>0.145</td>
</tr>
<tr>
<td>LOG(GDP)</td>
<td>0.37</td>
<td>0.37</td>
<td>0.975</td>
<td>0.111</td>
</tr>
<tr>
<td>LOG(CO²)</td>
<td>0.36</td>
<td>0.36</td>
<td>0.976</td>
<td>0.111</td>
</tr>
<tr>
<td>LOG(MARKET)</td>
<td>0.55</td>
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<td>0.111</td>
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<td>Dependent Variable: LOG(FDI) -- India --</td>
</tr>
<tr>
<td>Method: Least Squares</td>
</tr>
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<td>Date: 12/15/13 Time: 01:05</td>
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</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.63</td>
<td>0.63</td>
<td>-0.91</td>
<td>0.141</td>
</tr>
<tr>
<td>LOG(AIRTRAN)</td>
<td>0.25</td>
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<td>0.930</td>
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**Fig 3. Processing of Methodology**

Above variables can now be used to formulate the Linear Regression: Log-Linear as follows:

\[ \hat{Y} = \beta_0 + \beta_1 X + \varepsilon \]

\[
\log(FDI) = \alpha + \beta_1 \log(Airtran) + \beta_2 \log(GDP)
+ \beta_3 \log(Claim) + \beta_4 \log(Co²) + \beta_5 \log(High)
+ \beta_6 \log(Export) + \beta_7 \log(Labor) + \beta_8 \log(Market)
+ \beta_9 \log(RD) + \beta_{10} \log(Trademark)
\]

1. FDI = Foreign direct investment: FDI, net inflows (BoP, current US$)
2. Airtran = air transport, freight (million ton-km)
3. GDP = Gross Domestic Product: GDP (Current Us$)
4. Claim = claims on central government, etc. (% of GDP)
5. Co² = carbon credit emissions from transport (million metric tons)
6. High = high-technology exports (% of manufactured export)
7. Export = export of good and service (% of GDP)
8. Labor = labor force, total
9. Market = market capitalization of listed companies (% GDP)
10. RD = researchers in R&D (per million people)
11. Trademark = trademark applications, total

**REFERENCES**


The result of formulation the factors in the Linear Regression by Eviews program. Shows that the relationship are in the same direction in which the relationship value will depend on the value of the variable that are to stated in the equation. Thus, we can conclude as follows.

A. The cause in the People’s Republic of China

From the above equation is the equation for the supply of foreign direct investment. It can be seen that this equation, the independent variable can be explained by the dependent variable up to 97 percent (consideration of the $R^2$) and consideration of the F-statistic, a hypothesis test that the calculated coefficients are all equal to zero. It turns out that the calculated coefficient value has a value different from zero at the 95% confidence level. [consideration of the F-statistic value, which is greater than the critical value at the 95% level of confidence or Prob. < $\alpha$] and the D.W.=2.13 is closed to 2 shows that there is no problem with autocorrelation. From the equation can describe the preliminary; high-technology, exports, Gross Domestic Product(GDP), market capitalization, researchers in R&D, $Co^2$, and labor force that there is a relationship with foreign direct investment in the same direction. Part of air transport, claims on central government, and trademark applications show there is the relationship with foreign direct investment in the opposite direction.

The significant relation between the key factors especially the foreign direct investment is to shown in table(4) and the linear graph figure(4)

With the formulation from both of the two countries, there are corresponding economics theories that Foreign Direct Investment.

The measurement if SEZ will succeed or not depends on variables used in the formulation model. What is to be considered as the main variable is foreign direct investment, as it pushes the economy growth. In addition, foreign investment in a country also leads to transfer of technological advances from a developed country to a developing country. A country can boost its growth in the economy by free trade, foreign direct investment, and only by supporting the import and export of goods.

From the studies, we found out that the objective of foreign direct investment is to
1) Find potentially new markets in order to reduce the transportation cost
2) Find new resources be to used in the production process which may be a result of the expansion of vertical integration and tighter control for the value chain
3) Creates diversification in target customers as to mitigate the risk
4) Reduces the level of competition
5) Transfer of technological advancement

In conclusion, it can be said that foreign direct investment is one of the key mechanisms that drive the economic growth in the country. Furthermore, it leads to higher GDP growth, which helps the SEZ to be developed. As for Thailand, it should adopt using the mathematical model for establishing the SEZ. As such, the author has drawn the scope for Thailand and breaks it into 3 phases.

V. THE FUTURE OF SPECIAL ECONOMIC ZONE FOR THAILAND

Accurate inspection of the mathematical model with many countries has an increased the accuracy of the mathematical model, which can be applied to other countries, providing a location advantage such as United States of American [45-47] and AEC country.

For the case of Thailand, the authors plan a scope for developing SEZ in Thailand in 3 phases as shown in fig 5

---Phase 1, formulate equation using the mathematic model. The used the mathematical model will require careful analysis with Thailand to check if it is suitable or not.

---Phase 2, study the environment. Looking into the actual data collection process and analyze the possibility that will be most suitable for Thailand’s environment.
--Phase 3, establish SEZ. After the analysis, we want to study the actual area that will be use to create the SEZ. We want to make sure that these areas can support the upcoming AEC.

VI. CONCLUSION

Establishing a Special Economic zone (SEZ) is the key factor in attracting foreign investment into the country. The government must truly realize the importance and then, invest heavily to establish the SEZ in their countries. In order to evaluate if a SEZ will be a success or not, we must measure it by the amount of foreign direct investment, private investment, and investment that arises within the country itself. These factors lead to higher GDP and higher national income. Moreover, GDP is a key indicator of a country’s stability, wealth, and the success of the previous regulations implemented by the government.

As such, one can establish the special economic zone by establishing incentives for international investing by lowering the tax rate, and loosening some of the rules and regulations like rules about transferring the company’s income, trade, or even the foreign labor.

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