A STUDY ON FACTORS AFFECTING THE INVESTMENT DECISION ON THE ROAD-TRAFFIC INFRASTRUCTURE DEVELOPMENT FUNDED BY THE STATE BUDGET IN VIETNAM

Cu Thanh Thuy
PhD candidate at National Economics University, Viet Nam and lecturer at Ha Noi Architectural University (HAU), Viet Nam

Tran Tho Dat
National Economics University, Viet nam

Abstract- This research was carried out to analyze some factors affecting the investment decision on the road-traffic infrastructure development funded by the state budget in Vietnam. The research findings have indicated a number of factors such as socioeconomic conditions of Vietnam, expected results of investment projects on the road-traffic infrastructure development funded by state budget, natural conditions, etc. Each factor has different impacts on their investment decisions. Based on the study results, the author has proposed some suggestions to promote factors that have positive effects and limit those having negative ones on the investment decisions to develop the road-traffic infrastructure funded by the state budget in Vietnam.

Key words: Investment decision, factor, Vietnam, road traffic, infrastructure

1. RATIONABLE

In the context of increasing international economic integration, the demand for the development of road-traffic infrastructure has become increasingly urgent. The development of road-traffic infrastructure has created basic conditions for the socioeconomic development of localities as well as the socioeconomic development of Vietnam. According to the Vietnam Road Administration (2017), by the end of 2016, the total road length of Vietnam was about 417,204 km, of which the length of the national highway was about 22,660 km and the length of the expressway was 114,146 km. However, the capital requirement for the investment in road-traffic infrastructure development in particular, and the investment in other fields in general is enormous; the time of collection; the time for capital recovery is long; public projects account for a large proportion of construction works, etc. Therefore, the implementation of those projects takes many risks, which also affects the investment decision of investors. In the scope of this research, the researcher focuses on a number of factors affecting the investment decision to develop road-traffic infrastructure funded by state budget in Vietnam so as to analyze the level of influence of those factors; thereby, propose recommendations to enhance the acceptability and investment decision on the development of road-traffic infrastructure in Vietnam.

2. RESEARCH OVERVIEW

Factors affecting the investment performance play an
important role in ensuring accurate investment decisions in order to obtain certain achievements in finance and other effects. According to Robbins and Coulter (1996), to make investment decisions, there need seven steps: (i) identifying the problem, (ii) setting criteria for the decision, (iii) quantification of standards, (iv) developing a plan, (v) evaluating and selecting the optimal option, (vi) organizing the implementation of the plan, and finally (vii) evaluating the effectiveness of the decision. For each business, investment decision is the decision to use capital and other resources to increase new assets, create jobs, develop human resources. In order to make an investment decision, according to Dunning John (1997), there are three groups of factors influencing this process: (i) the key ownership advantages (O), including assets, transaction costs; (ii) locational advantages (L) including natural resources, market growth, infrastructure, and government policies; and (iii) Internalisation advantages (I), including the advantages of transaction costs, information; the cost advantage of implementing the patents and inventions. On the basis of Dunning's (1997) theory, Gilomre et al. (2003) argue that the following factors influence investment decisions: (1) Government views and financial incentives – If the host country is actively engaged in attracting investment, the country / locality or region is more attractive than those where an investor takes much time and procedures to have his investment project approved; (2) Inflation, economic policies, tax rates and tax structure - are an important factor influencing investment decisions. (3) Transportation, materials and labor costs - These are important costs that companies /businesses must consider for their investment. (4) Technology - Technology is considered one of the most important factors involved in investment decisions. (5) Political stability is a factor that attracts investors. On the inheritance of the OLI model, Phung Xuan Nha (2001) has divided factors that influence the investment decision into two groups, namely Pull and Push. The Push factors include environmental factors of the investing countries such as economic potentials; science and technology; macro policy changes, activities promoting the government's offshore investment. Pull factors (attracting) from the invested countries include political conditions, legal policy, geographic location, natural conditions, level of economic development, and socio-cultural characteristics. In addition to these two groups of factors, investment decisions are influenced by environmental factors (Solvent). Investment decisions are also considerably affected by factors related to the macroeconomic prospects and monetary policy implemented in a country that are reflected in expected GDP growth and interest rates (Karim & Azman-Sainib, 2012, Esfahani et al, 2003, Glen weisbrod, 2009). In addition, investment decisions are influenced by external decisions related to government activities. In particular, tax policy directly affects return on investment (Alam and Stafford, 198; Santoro and Wei, 2012). Empirical studies also show that investment decisions depend on infrastructure factors (Dunning, 1997, Le Hoang Ba Huyen, 2012, Le Hoang Ba Huyen et al, 2013), or GDP, interest rates (Trieu Hong Cam, 2003). Human factors are also mentioned as one of the important
factors influencing investment decisions (Le Hoang Ba Huyen, 2012). Moreover, the consideration of investment decisions is based on factors such as government policies and incentives, social factors, political situation of the invested countries. These factors have been studied by many researchers in many different ways. Tu Quang Phuong and Pham Van Hung (2013) also point out that the investment decision is influenced by three groups of factors, the first belonging to the target countries (political situation, legal environment, geographic location, natural conditions, the level of economic development, socio-cultural characteristics); the second belonging to the investing countries, and the third is regional and international factors.

3. RESEARCH METHODS

3.1. Data collection method
The data for the study was collected from the pre-feasibility report of the projects collected from the Ministry of Planning and Investment, the Ministry of Finance and the Office of the National Assembly. These include invested projects and non-invested projects; randomly selecting projects approved during the research period from 2012 to 2016 to collect data for the analysis of factors affecting the investment decision.

3.2. Data analysis method
In this study, binary logistic regression has been used to perform the analysis. The Binary Logistic Regression method uses binary dependent variables to estimate the likelihood-ratio of an event with the given information of independent variables. The information collected for a dependent variable is an event that may occur (the dependent variable Y now has two values of 0 and 1, 0 means no event happens and 1 means an event happens). And obviously the information on independent variables \(X_1, X_2, \ldots, X_k\) is also included. Based on these binary dependent variables, a procedure is used to predict the likelihood-ratio of an event according to the rule if the predicted likelihood-ratio is greater than 0.5 (default cut-off point), the predicted result will be “Yes”, otherwise it is “No”.

\[
1 - P = \text{Prob}(Y = 0) = 1 - \frac{e^Z}{1 + e^Z} = \frac{1}{1 + e^Z}
\]

\(P\) is the likelihood-ratio so that \(Y = 1\) (the condition for an event to occur) when independent variables have specific value. Hence, the ratio for an event not to occur is calculated by:

\[
1 - P = \text{Prob}(Y = 0) = 1 - \frac{e^Z}{1 + e^Z} = \frac{1}{1 + e^Z}
\]

In which, \(Z = B_0 + B_1X_1 + B_2X_2 + \ldots + B_kX_k\)

The regression coefficients are estimated by using Maximum Likelihood method. Binary logistic regression model was applied to estimate the probability of changes in the investment decision for the development of road-traffic infrastructure funded by the State budget; simultaneously, analyze the influence level of factors on investment decisions for projects to develop road-traffic infrastructure funded by the State budget.

4. RESEARCH FINDINGS
The study used the Binary Logistic regression to analyze the influence of factors on investment decision to the development of road traffic infrastructure funded by the State budget, in which Dependent variable (Y): investment decision on the development of road-traffic infrastructure funded by the State budget; Y gets value 1 when is made and 0 when the decision is not made.
Independent variables:
+ Socio-economic conditions: The scale used for the research is the appropriateness between the investment project for the development of road traffic infrastructure funded by the State budget and the socio-economic development plan. According to Tu Quang Phuong and Pham Van Hung, 2013, the projects that are invested and deployed should be in line with the socio-economic development plan of the country and of the locality. If the project is in line with the socio-economic development plan of the locality, the probability of being approved for investment will increase and vice versa.
+ Expected results of an investment project for the development of road-traffic infrastructure funded by the State budget: To measure this variable, some scales are used such as the impact level of the project to households, expected length of the project, traffic flow.

✓ Impact of the project on households: According to Phung Xuan Nha (2012), Tu Quang Phuong, Pham Van Hung (2013), Karim et al. (2002), Santoro et al. (2012), Gilmore et al. (2003), the more support projects receive from people, the more easily and successfully the project would be; otherwise, those projects will negatively be affected. Negative effects on the interests of households will cause many difficulties to the progress and results of a project; therefore, investors will feel cautious to make their investment decisions. As a result, the less negative impacts on households a project has, the more likely it is to be invested and vice versa.
✓ Estimated traffic flow: Reflecting the number of vehicles expected to circulate per day, measuring unit - PCU/day. The more important the project is in order to address the needs of society, the greater probability there will be for the investment decisions and vice versa (Karim et al, 2002, Santoro et al, 2012, Gilmore et al, 2003)

+ Natural conditions: Natural conditions are important factors affecting the investment decision. Investment projects for the development of road-traffic infrastructures under outdoor conditions are relatively influenced by the natural conditions of the localities where the projects are implemented. Favorable natural conditions will positively affect investors’ decisions and vice versa (Agnieszka Chidlow & Stephen Young, 2008, Tu Quang Phuong, Pham Van Hung, 2013).

The results are shown as follows:

Table 1: Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th>Step</th>
<th>Chi-square</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step</td>
<td>143,302</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Step 1 Block</td>
<td>143,302</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Model</td>
<td>143,302</td>
<td>4</td>
<td>.000</td>
</tr>
</tbody>
</table>

Source: Results from the data analysis with the help of SPSS 20.0 software

According to the test results of the model suitability, coefficient Sig. <0.05, so the correlation between the dependent variable and the independent variables in the model is statistically significant with a confidence interval greater than 99%.

Table 2: Model Summary

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
</table>
Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Source: Results from the data analysis with the help of SPSS 20.0 software

The explanatory power of the model, with the Nagelkerke R² = 0.822, indicating that approximately 82.2% of changes in dependent variable is explained by the independent variables in the model, the rest is explained by other factors.

Table 3: Classification Table

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ_DA</td>
<td>Percentage Correct</td>
</tr>
<tr>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Overall Percentage | 92.7 |

a. The cut value is .500

Source: Results from the data analysis with the help of SPSS 20.0 software

Results shown in Table 3 on the accuracy of predictions show that, of the 69 non-invested cases, the model predicted accurately 64 cases, with accuracy rate of 91.4%. Of 81 cases with investment decisions, the model accurately predicted 75 cases, with accuracy rate of 93.8%. Basing on that, the accuracy prediction rate of the model was calculated as 92.7%.

Table 4: Variables in the Equation

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quy_hoach</td>
<td>.899</td>
<td>.351</td>
<td>6.370</td>
<td>1</td>
<td>.010</td>
<td>2.457</td>
</tr>
<tr>
<td>Hodan_anhhuong</td>
<td>.611</td>
<td>.395</td>
<td>3.222</td>
<td>1</td>
<td>.068</td>
<td>1.843</td>
</tr>
<tr>
<td>DKTN</td>
<td>.873</td>
<td>.159</td>
<td>5.412</td>
<td>1</td>
<td>.015</td>
<td>2.434</td>
</tr>
<tr>
<td>LN_LUU_LUONG</td>
<td>.560</td>
<td>.301</td>
<td>3.450</td>
<td>1</td>
<td>.059</td>
<td>1.750</td>
</tr>
<tr>
<td>Constant</td>
<td>-12.193</td>
<td>2.080</td>
<td>54.371</td>
<td>1</td>
<td>.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Variable(s) entered on step 1: NNDT, Hodan_anhhuong, Danh_gia_GT, LN_LUU_LUONG.

Source: Results from the data analysis with the help of SPSS 20.0 software

Thereby, the regression equation has the following form:

\[
\text{Ln } \left( \frac{P(Y=1)}{P(Y=0)} \right) = -12.193 + 0.899 \times \text{Quy_hoach} + 0.611 \times \text{Hodan_anhhuong} + 0.873 \times \text{DKTN} + 0.56 \times \text{LN_LUU_LUONG}
\]

+) The suitability of the project with the socio-economic development planning (Quy_hoach): Measuring the appropriateness between the investment projects on the development of road-traffic infrastructures funded by the State budget and the socio-economic development plan of the country. According to the results of written evaluations by relevant agencies, departments and institutes, when mentioning each project, the author used data coded according to the five-point likert scale, and the written evaluation level of inspecting agencies. If the result value is 1, it is inconsistent; and appropriate when it increases gradually to scale 5. The results of the study showed that the coefficient of B = 0.899 meant a positive relationship between the suitability
of the socio-economic development planning of the project and the investment decision. The research results also support the findings of Tu Quang Phuong and Pham Van Hung (2013)

+ Evaluation of the impact of the project on households (Hodan_anhhuong): reflects the impact of the investment project on households, in which the five-point likert scale was used to encode data from the evaluation of agencies. Data coding was carried out as follows, the number of expected households that were affected was mentioned in the pre-feasibility reports of projects, (involving land recovery from households or households affected by the projects); the author then performed the coding: If the number of affected households was less than 1,000, it would be coded as 5, if the number of affected households was from 1,000 to less than 2,000, the coding result returns to value 4; If the number of affected households was between 2,000 and under 3,000, the coded result returns to value 3; If the number of affected households was from over 3,000 to less than 4,000 households, the result of the encoding returns to value 2; If the number of affected households was from more than 4,000 to less than 5,000 households, the result returns to value 1 … Calculated results of the author shows that the coefficient B = 0.611, indicating that the less affected the households are, the more likely investment decision will be. In fact, the support of people for investment projects to develop road-traffic infrastructure is very important. With the household’s agreement, the project implementation will be favorable. In addition, limiting the negative impact on people will also increase the investment potential of the project. The research results also support the views of Phung Xuan Nha (2012), Tu Quang Phuong, Pham Van Hung (2013), Karim et al. (2002), Santoro et al. (2012), Gilmore et al. (2003)

+ Natural conditions (DKTN): Natural conditions are an important factors affecting the investment decision. Investment projects for the development of road traffic infrastructures are carried out in outdoor conditions; therefore, they are relatively influenced by the natural conditions of the localities where the projects are implemented. However, to meet the requirements of infrastructure for socio-economic development of localities, despite the difficult natural conditions, the Government still has to invest in this field. This is a specific characteristic of the Government project in comparison with in private ones which only support enterprise’s’ production and business activities. The study results show that the coefficient B = 0.873, which means that areas with harsh natural conditions seems to increase the probability of investment projects. It is in line with the reality in Vietnam; investment projects to develop road-traffic infrastructure are often implemented in areas with natural, topographical and climatic disadvantages such as the North West, Central Highlands, Central region.

+ Estimated traffic flow (LN_Luu_Luong): reflects to the number of expected traffic flows per day, measuring unit PCU/day. The research results show that B = 0.56 indicates the positive relationship between variables and dependent variables. The study results also support the views of Karim et al. (2002), Santoro et al. (2012), Gilmore et al. (2003).

5. RECOMMENDATIONS
Investment in the development of road-traffic infrastructure funded by state budget is of great significance, contributing to improving people’s living standards and boosting the socio-economic development of the country. However, if the investment decision in projects to develop road-traffic infrastructure is inaccurate, it will lead to ineffective capital use, and intangible effects on the results and investment efficiency. Therefore, state authorized agencies should have orientation and select accurate investment projects for the development of road traffic infrastructures funded by the State budget to ensure that the projects are properly and successfully invested, contributing to the socio-economic development of the country: Identifying the investment scale and the list of investment projects in the order of priority to minimize the “double” waste of state budget, avoiding such situations in which the necessary projects do not get enough capital to implement while others have redundant capital. It is necessary to pay more attention to the development of road-traffic infrastructure funded by the State budget for projects in the direction of linking with regions, production support, improving investment environment, ensuring social security, national security, implementation of targeted programs, etc. It is necessary to develop a suitable set of and standards to provide a basis for selection and approval of investment projects for the development of road traffic infrastructure funded by the state budget according to investment scope and targets, socioeconomic development, benefits of the country, localities, branches; the obtained benefits should be balanced in the short and long term. To strictly control the evaluation and approval of investment projects for the development of road-traffic infrastructure funded by the State budget; minimize the adjustment of increasing the scale and level of the investment. Priority should be given to key projects that are urgent and likely to be completed soon; resolutely not to make investment decisions lack of eligible investment procedures; minimize the advance of budget plan.

REFERENCES


