

# Identifying the Factors that influence the Process Optimization of New Investment Appraisal

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## Abstract

The FDI approval process is one of the decisive factors of successful implementation of investments in a country. This paper attempts to identify the relationship and association between several factors that involves in new FDI appraisal process by the host country. It identifies factors such as global presence of the intended investor; the type of Industry; expected contribution from the investment; potential for gaining competence regarding human resource; expected developments in the country's infrastructure. The study suggests that above factors are critical to the relevant authorities who involved in FDI promotion. This research also ranks these factors to make the conclusions more useful in the real-life application. It also highlights the number of employments generated for local workers under the new investment. The new investments bring additional knowledge, skills, and competence that usually not quantified at the appraisal level. The success rate of similar investment in other countries also to be critically evaluated. The findings of this research could be extremely useful for countries who wish to host FDIs. A clear understanding about the key influencing factors and their association with the investment appraisal process would be the key to optimize the process.

**Keywords:** investment appraisal, artificial intelligence, machine learning

## 1. Introduction

### 1.1 Introduce the Problem

Generally, investing in a foreign country is a risky decision for the investor and vice versa. On one hand, unless proper evaluation between the risks and rewards of investing in a specific country is conducted by an expert, it is difficult to identify the right investment location. Similarly, there are risks from the host country perspectives too. Firstly, a foreign direct investment (FDI) can hinder domestic investment of the host country. There are risk from political changes of the investing country or other countries' political movements can be changed constantly which could hamper the investors and the negative exchange rates that may sometimes affect to the advantage of one country and the detriment of another (Research FDI, 2021). It is critical to evaluate the impact on the society, environment, country's tradition, comparative and competitive advantages, legal regimes etc.

The approval process of a FDI is usually long and tiring exercise for both the investor and the host country. Considering the excessive time taken to approve FDI applications, it is vital to find ways and means to expedite this process. According to the analysis of exploratory study it was revealed there are opportunities for improvements at the appraisal stage using the modern information communication technology (ICT). For example, it is identified that artificial intelligence and machine learning could be instrumental in optimizing the FDI application process. However, to make use of technical tools to optimize the process, initially it needs to investigate about the key variables that should be critically analyzed during the investment appraisal process. This would facilitate the authorities in host country to explore possibilities using the technology to carry out an effective and efficient appraisal in a shortest possible time.

FDI flows are generally associated with income levels and market sizes of host countries (Zhang, 2001). FDI is critical for developing and emerging market countries. Despite certain risks many countries try to attract potential investors due to its substantial benefits to the economy eventually. Accordingly, there is a global competition to attract FDIs and the opportunities in the host country should be marketed properly. Providing the best services always is the key to make the host country marketable among this heavy competition. The investment appraisal is the most critical stage because it creates the first impression about the host country by the investor. The problem

that focusses on this study is to explore the key criterion that should be evaluated when approving foreign direct investments.

### *1.2 Research Background*

A foreign direct investment occurs when a company or an investor purchase of an interest in a company located outside its own borders. This purchase could be operationalized by means of a merger or acquisition, setting up a new venture, or expanding the operations of an existing one. Generally, this term describes a business decision to acquire a substantial stake in a foreign business to expand its operations to a new region. However, it does not usually describe a stock investment in a foreign company though. Raising money for established or start-up business requires funds to sustain and sometimes finding them within the country is a challenging task when capital is not readily available. Companies or even governments turn towards foreign direct investments in such circumstances that have become an important source of funding for domestic businesses. FDI in many countries is a critical driver of economic growth and is rigorously promoted by the government to attract more investments. However, this could create some negative impacts of the domestic economy if this is not managed properly this a prior permission by the government and its concerned ministries is mandatory to establish an FDI. For example, an FDI in Sri Lanka should be compatible with many legislatures, inter alia, Board of Investment Law No.4 of 1978 (BOI Act); Land policy at the time of application; Finance Act No.12 of 2012; Inland Revenue Act No.24 of 2017; Strategic Development Projects Act No.14 of 2008; and Foreign Exchange Act No.12 of 2017.

Filing a FDI application and submitting to respective authorities is a time consuming and tiring job in some host countries. Many investors give up their interest in certain host countries even at the initial stage due to bureaucracy and similar investor unfriendly experiences. However, some countries manage this stage very methodically and investors always give priority for them as they can commence the production/business activities within an abbreviated period. Those countries who fail to gain this competitive advantage tend to lose the FDI opportunities even if they own various other advantages of resources to attract investors. The World Banks Doing Business report recognizes regulations affecting eleven areas of the life of a business. This report benchmarks aspects of business regulation and practice using specific case studies with standardized assumptions when scoring based on an economy's performance. It includes (i) starting a business, (ii) dealing with construction permits, (iii) getting electricity, (iv) registering property, (v) getting credit, (vi) protecting minority investors, (vii) paying taxes, (viii) trading across borders, (ix) enforcing contracts, (x) resolving insolvency and (xi) labor market regulation. It is one way to assess the variability of an economy's regulatory performance. It is vital to note that all these stages be proactively considered at the time of evaluating a new investment proposal. Therefore, it is paramount to understand the process of setting a business in a foreign country, operating it successfully.

The primary objective of the study is to identify the factors (independent variables) that may influence the dependent variable namely, FDI appraisal process. These independent variables include, (i) global presence of the targeted investor, (ii) infrastructure benefits expected by the host country, (iii) expected contribution to the local economy through the intended investment, (iv) human resource competence in the host country to cater to the intended investment project, and (v) the type of industry the target investment belongs to. Another objective of this research is to understand the relationship and association between the selected variables that leads to optimization of FDI appraisal. The finding of this research will be of vital importance to develop a mechanism to expedite the process of a new investment appraisal.

### *1.3 Literature Review*

FDI accelerates host countries' growth through variety of factors. It helps to increase domestic savings and investment from economics perspectives. This benefits all stakeholders involved in the investment. Despite what is promised and conveyed at policy level, investors subsequently face many difficulties in the implementation stage of projects in some situations. Due to these uncertainties, investors are extremely concerned about proper application process for the ease of getting the business started in the hosting country (Hanson, et al., 2021). It is sometimes considered as tantamount to postcolonial exploitation of raw materials and cheap labor (Moran, et al., 2017). The government support of the host countries for FDI friendly policies plays a strong role when firms choose to enter developing countries (Lu, et al., 2014). While it increases competition in the host country's domestic market the local manufacturers will compel to transfer of technology from the industry giants to sustain. Irrespective to the fact the productions are merely for exports due to customs duty and taxes or for the local consumption FDI increases the earnings of foreign exchange. Global economy has led to attract inward FDI to stay competitive whatever their economic and development levels are (Fabry & Zeghni, 2003) (Fabry & Zeghni, 2002). Depending on the type of industry that are attracted to a host country there are many positive externalities that realizes as spillovers to the economy (Ram & Zhang, 2002). Foreign investments and generally described

under three parameters namely, lending; equity investment; and foreign direct investment (Nordal, 2001). The common perception is that FDI is motivated by the desire to deploy firm specific technology intensive assets (Neven & Siotis, 1996).

## 2. Method

The research approach of this paper is tri faceted combining opinion survey, desk research and a questionnaire survey. An exploratory study and comprehensive literature survey was conducted prior to the interviews and questionnaire survey. Regarding the interviews, a convenient sample of seven opinion leaders representing major stakeholders of the investment sector was consulted. The discussions were interactive, informal, non-time bound, iterative thus researchers were able to capture more insights. Secondary data were collected through domestic and international publications. Since there were lesser data about current investment appraisal process researchers were compelled to depend on general opinions rather than precise statistics. Logical comparisons were done about primary and secondary data as appropriate. Contemporary reports and analysis of international institutions such as International Bank for Reconstruction and Development (IBRD); The World Bank; United National Industrial Development Organization (UNIDO); and World Economic Forum (WEF), United Nations Conference on Trade and Development (UNCTAD) were studied extensively to compare various trend and opinions.

This paper attempt to identify the factors that may influence the approval process of a new investment. Accordingly, it investigates the criterion that should be evaluated when accepting a FDI by the host country.

There are five independent variables of the study namely, Global Presence (GPR); Infrastructure Benefits (INB); Contribution to the Local Economy (CLE); Human Resource Competence (HRC); and Type of Industry (TIN). Optimizing FDI Appraisal (OPT) is the dependent variable. Therefore, the study uses these variables in the conceptual framework to develop hypothesis and questionnaire for the quantitative analysis. Researchers reviewed the findings at the interviews and desk research prior to attending the questionnaire survey and developed five hypotheses based on the literature survey and the exploratory study.

H0: Global presence of the targeted investor has no relationship with FDI appraisal process

H1: Global presence of the targeted investor has no relationship with FDI appraisal process

H0: Infrastructure benefits available in the hosting country has no relationship with FDI appraisal process

H2: Infrastructure benefits available in the hosting country has a relationship with FDI appraisal process

H0: Contribution of the intended investment to the local economy has no relationship with FDI appraisal process

H3: Contribution of the intended investment to the local economy has a relationship with FDI appraisal process

H0: Human resource competence available in the hosting country has no relationship with FDI appraisal process

H4: Human resource competence available in the hosting country has a relationship with FDI appraisal process

H0: Type of industry of the targeted investor has no relationship with FDI appraisal process

H5: Type of industry of the targeted investor has a relationship with FDI appraisal process

The questionnaire consisted of two sections namely, demographic and technical questions. The respondents were requested to answer all questions in section (ii) while section (i) was kept optional. There were thirty questions included in the section. It investigates about the key appraisal criterion of the investment towards application process optimization. Respondents were requested to select 1-5 (i.e., 1 for strongly disagree and 5 for strongly agree) in the likert scale to provide their opinion for above statements under each variable in the conceptual framework. Data were analyzed using the SPSS package and parametric test was conducted. Carl Pearson Correlation of coefficient analysis was administered to identify the association between the variables. Researchers used multi regression method through applying ordinary least square model to understand the influence of each variable to optimize the FDI appraisal process. A questionnaire survey has been conducted using 124 officials in relevant organizations namely, Ministry of finance, Ministry of industries, Senior officers of Board of Investment (BOI) Sri Lanka, Export Development Board, Department of Customs, investment and export/import related

industry associations, selected leading manufacturing firms in the public sectors, private firms registered under BOI and non-BOI, and selected universities.

## 2. Analysis and Discussions

The researchers identify five key variables that may influence the FDI appraisal process. Firstly, the global presence of the applicant because status of the investor's presence in any other country in the past and/or at present provides a better insight about their compatibility in the new hosting country. The second variable is "Infrastructure benefits". The benefits expected by the host country from the applicant by way of income namely, annual ground rent and commercial value of buildings etc. and non-cash benefits such as the amount of expected foreign currency receiving and other resources, new skills for building construction, the intended area of the building as it will remain in the host country even after the investor exits. Thirdly, expected contribution to the local economy of the host country. The intended revenue generating to the country from exports; number of employments generated for local workers; the construction materials that could be sold locally for the new project; duration for project implementation until the commercial operation; expected revenue generation by providing products and services to foreign countries; volume of services provided locally; amount of local currency circulation; amount of foreign currency receiving during implementation etc. are considered here. The forecasted employment requirements and human resource competence expected employments generated for local workers are considered in the fourth variable. Type of industry is the fifth variable.

Researcher tested internal consistency of likert scale items by using Cronbach's Alpha (CA). To maintain the CA value of all variables greater than seven researchers dropped one item under last component namely, "Optimizing FDI Appraisal" when operationalizing corresponding variables to apply in the analysis. Final results after dropping one item are provided in the table 01 below.

Table 1. Reliability Statistics

Investment appraisal criteria	Cronbach's Alpha	No. of Items
<b>Global Presence (GPR)</b>	0.799	3
<b>Infrastructure Benefits (INB)</b>	0.837	4
<b>Contribution to the Local Economy (CLE)</b>	0.749	10
<b>Human Resource Competence (HRC)</b>	0.781	4
<b>Type of Industry (TIN)</b>	0.906	4
<b>Optimizing FDI Appraisal (OPT)</b>	0.749	4

According to the table 01 researchers provides the investment appraisal criteria, CA and number of items used to operationalize corresponding variables. All the CA values are greater than 0.7. Therefore, there is an internal consistency among the likert scale items as they are having acceptable level of internal consistency.

To examine the nature of variables researcher tested the mean values of the variables. According to table 02 the mean values are around the likert scale 3. Therefore, there are neutral level responses for all variables except for CLE (contribution to the local economy). The mean value of CLE is close to 4 and is more towards agree level. In relation to standard deviation (SD) highest SD 0.944 belong to INB. Therefore, responses given to Infrastructure benefits are comparatively more deviated. Minimum SD 0.39 belong to CLE. Therefore, responses given to Contribution to the Local Economy are less deviated.

Table 2. Summary of statistics

	GPR	INB	CLE	HRC	TIN	OPT
Mean	2.5995	2.9355	3.8177	3.0585	3.4294	3.1472
Std. Deviation	.89663	.94400	.39180	.78419	.80178	.68150
Skewness	.657	.372	-.176	.493	.612	-.005

All the coefficients of skewness are between -1 and +1. Accordingly, variables are approximately normally distributed. Therefore, parametric test has been applied to the data set.

One of the objectives of the study is to identify the relationship and association between the selected variables namely, GPR, INB, CLE, HRC, TIN, and OPT. accordingly, correlation analysis was exercised.

Table 3. Correlations

		GPR	INB	CLE	HRC	TIN	OPT
GPR	Pearson Correlation	1	.569**	.104	.813**	.513**	.679**
	Sig. (2-tailed)		.000	.248	.000	.000	.000
	N	124	124	124	124	124	124
INB	Pearson Correlation		1	.277**	.641**	.385**	.376**
	Sig. (2-tailed)			.002	.000	.000	.000
	N		124	124	124	124	124
CLE	Pearson Correlation			1	-.006	-.094	-.261**
	Sig. (2-tailed)				.947	.301	.003
	N			124	124	124	124
HRC	Pearson Correlation				1	.459**	.721**
	Sig. (2-tailed)					.000	.000
	N				124	124	124
TIN	Pearson Correlation					1	.442**
	Sig. (2-tailed)						.000
	N					124	124
OPT	Pearson Correlation						1
	Sig. (2-tailed)						
	N						124

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Parametric test applied in the study to identify the association between the variables is Carl Pearson Correlation of coefficient analysis.

Probability of relationship between OPT and GPR is 0.000. this is highly significant. Coefficient of cocreation is 0.679. This means that there is highly significant positive relationship between FDI appraisal process and identifying/recognizing the global presence of the intended investor. Accordingly, hypothesis 1 is accepted. Probability of relationship between OPT and INB is 0.000 and this is also highly significant. Coefficient of correlation is 0.371. Accordingly, results indicated that there is a highly significant positive relationship between FDI appraisal process and Infrastructure Benefits as well. Accordingly, hypothesis 2 is also accepted. Probability of relationship between OPT and CLE is 0.003 and highly significant. Coefficient of cocreation is -0.261. It indicates that there is highly significant negative relationship between FDI appraisal process and non-availability of reliable data about the contribution of the intended investment to the local economy. Accordingly, hypothesis 3 is accepted. Similarly, the probability of relationship between OPT and HRC is 0.000 reflecting a highly significant statistical output. Coefficient of cocreation is 0.721. This means that there is highly significant positive relationship between FDI appraisal process and identifying/recognizing the human resource competence of the hosting country. Accordingly, hypothesis 4 is accepted. Finally, the probability of relationship between FDI appraisal process and the type of Industry of the intended investment was tested. P value of this combination is 0.003 and highly significant as per table No,. It indicates that there is highly significant positive relationship between FDI appraisal process and availability of reliable data about the contribution of the intended investment to the local economy. Accordingly, hypothesis 5 is accepted.

Another objective of this research is to understand the influence of each variable to optimizing FDI appraisal. Researchers used multi regression method through applying ordinary least square model.

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + u$$

The objective of the study is to identify the values of  $B_0$ ,  $B_1$ ,  $B_2$ ,  $B_3$ ,  $B_4$ , and  $B_5$  and the residuals ( $u$ ).

Table 4. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.171	5	7.234	40.735	.000 <sup>a</sup>
	Residual	20.956	118	.178		
	Total	57.127	123			

a. Predictors: (Constant), TIN, CLE, HRC, INB, GPR

b. Dependent Variable: OPT

As per the table 04, the Anova is significant at 0.000 and the model is valid. This means all independent variables jointly influence on the dependent variable.

The statistical analysis extended further, and modal summary was obtained.

Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. Change	
1	.796 <sup>a</sup>	.633	.618	.42142	.633	40.735	5	118	.000	1.757

a. Predictors: (Constant), TIN, CLE, HRC, INB, GPR

b. Dependent Variable: OPT

The coefficient of determination (or  $R^2$ ) is 0.633 which mean 63% of the FDI appraisal process (dependent variable) has been covered by the above model. The adjusted  $R^2$  is 0.618 reflecting a very marginal gap between  $R^2$  and adjusted  $R^2$ . This means there is not much unrepresented independent variables in the proposed model. Accordingly, this is considered as a nicely fitted model. Multiple correlation (or R) is 0.796 meaning that all the independent variables jointly correlate with the dependent variable namely, FDI appraisal process.

Validity of the proposed regression model was checked using the residual. The Durbin Watson (DW) test was carried out. DW value is 1.18 thus residuals are independent, and the model is found to be good.

In the regression Anova the probability of statistics is 0.000 and highly significant. That means the proposed independent variables jointly influence on the DV and the model is valid.

The objective is to identify the effect of the independent variables on the dependent variable namely, FDI appraisal using the individual coefficient table using beta values.

It was found that Anova F statistics P value of GPR, CLE, and HRC are significant and jointly influence on FDI appraisal. Variables TIN and INB are not statistically significant.

Table 6. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.062	.471		6.496	.000		
	GPR	.266	.078	.350	3.427	.001	.298	3.352
	INB	-.037	.057	-.052	-.650	.517	.493	2.030
	CLE	-.479	.108	-.276	-4.434	.000	.805	1.243
	HRC	.385	.094	.443	4.109	.000	.267	3.741
	TIN	.046	.057	.054	.798	.427	.690	1.450

a. Dependent Variable: OPT

The unstandardized Coefficient of GPR is highly significant. Therefore it has an individual effect on the dependent variable, two variables namely, infrastructure benefits and the type of industry are statistically insignificant. Therefore, neither INB nor TIN have an individual effect on the FDI appraisal process, but they have a joint effect. CLE is significant at 0.000 therefore, contribution to local economy has a highly significant positive effect on the FDI approval process. HRC is also highly significant. Based on the standardized coefficient of beta the said variables can be ranked as follows. HRC with highest beta value tops the rank. Second and third components in the order of impact will be GPR and CLE.

The variance inflation factor (VIF) is less than 10 for all variables. This means that the model has no collinearity problem. The scatter plot has no funnel shape and reflects the homoscedasticity thus the variance of the residuals are constant. Further it was noted as per the normal QQ plot that the residuals are normally distributed with 0 means.

Finally, the normal QQ plot was used to check whether the standardized residuals are normally distributed.

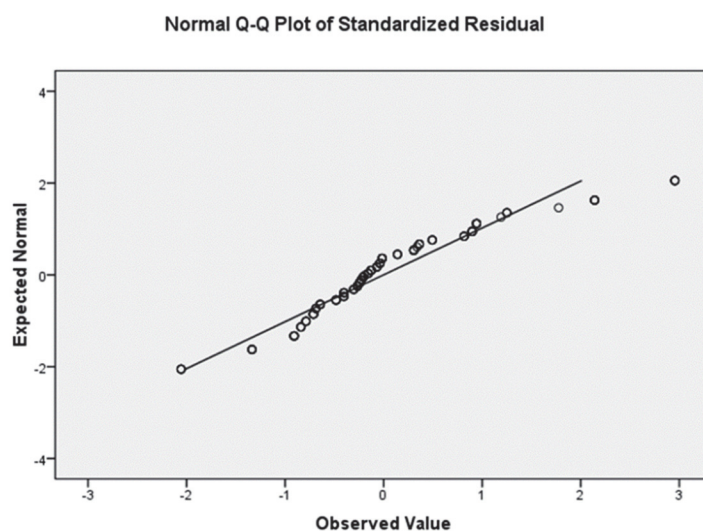


Figure 1. Normal QQ Plot

According to figure 01 majority of residuals are distributed close to the linear line with zero means thus it is confirmed the residuals are normally distributed.

### 3. Conclusions

This paper attempts to identify the factors that determines the speed of the approval process of a new foreign direct investment. Accordingly, the researchers have developed five hypotheses concerning the relationship between the appraisal process and i) the global presence of the prospective investor; ii) the infrastructure benefits available in the hosting country; iii) the contribution of the intended investment to the local economy; iv) the human resource competence available in the hosting country; and v) the type of industry of the prospective investor.

As per the statistical analysis it was identified that relevant authorities involved in FDI promotion need to consider five factors to optimize investment appraisal process. Accordingly, maintaining comprehensive data base about (i) global presence, (ii) infrastructure benefits, (iii) contribution to the local economy, (iv) human resource competence, and (v) type of industry may positively influence the process of evaluating investment applications of potential FDIs to a country. Another objective of this research is to rank the key criteria to realize the amount of care and attention that should be assigned to these individual components. While all the variables make a joint impact to the investment appraisal process human resource competence in the hosting country has been identified as most critical area in efforts to expedite the investment appraisals. This study proposes that the number of employments generated under the new investment for local workers is a vital factor. The employment requirement that cannot be fulfilled locally is another key factor. The knowledge, skills, and competence that the new investment could generate for local people is another vital factor to be considered at initial appraisal process. Awareness about various employment requirements pertaining to the new investment is also vital at initial appraisal process. Global presence of the applicant is the next important criteria that authorities should prioritize for best results. Under this variable, the global presence the new investment applicant is a vital factor to investigate. Comprehensive country-wise details about their current and past performance is a key appraisal criterion. On the other hand, the global market intelligence about the industry/sector of new investment is another vital factor to investigate. The other most critical factor is the success rate of the proposed sector in the global context. The expected contribution to the local economy is another factor that needs attention by respective authorities which is the third in the order of rank. The revenue generating to the country from exports; the requirement of constriction materials that can be fulfilled locally; ability to commence the commercial production quickly; the volume of services that could be provided locally; the amount of expected foreign currency receipts during implementation and the local currency circulation due to the investment; amount of expected income from investors for utility services and ground rent etc.; and the number of immigrants expected as foreign employees with special skills, knowledge etc. have been identified as vital factors at the investment appraisal process.

The finding of this research will be of vital importance to develop a mechanism to expedite the process of a new investment appraisal. It may be useful to explore avenues how the technology could be used in the investment promotion efforts. Therefore, a clear and comprehensive understanding about the association between optimization of investment appraisal process and these critical factors would be the key to the success for attracting FDIs to a country. As the results show the relationships between the variable and provides the ranking of the relevant items. The authorities may use machine learning and artificial intelligence to operationalize the appraisal process mechanism based on these guidelines. Further research are proposed to study about operationalization methods of each appraisal criterion. It will help the industry to learn from the conceptual framework and apply them in the real life scenario.

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