

The Effect of Timely Delivery of Construction Projects on the Economic Growth in Sri Lanka

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ABSTRACT

Economic growth is the increase in the production of goods and services in the economy from one time period to the next. Construction, as the sector with the biggest multiplier effect, has helped continue to accelerate Sri Lanka's economic growth. Timely construction output generates socioeconomic growth and wealth generation in a country. Delays are one of the major issues in the construction industry in Sri Lanka, which can have an ultimate impact on the growth of the national economy. Therefore, the research aims at investigating the effect of the late completion of construction projects in the public sector on the factors contributing to economic growth in Sri Lanka. A mixed-method approach was adopted, using preliminary interviews and questionnaires as data collection techniques. The collected data was analyzed using manual content analysis and the relative importance index (RII). Twenty (20) factors contributing to the economic growth in Sri Lanka were identified through both literature and preliminary interviews. Among them, Foreign Direct Investment (FDI), external debt, an effective procurement system, open direct assessment, and a proper system of transportation are the most important factors, as highlighted by the respondents. The impact of the delay in completion of public sector construction projects on the identified factors was identified through the questionnaire and classified into three levels: less impacted ($RII < 50\%$), averagely impacted ($50\% < RII < 70\%$), and highly impacted ($RII > 70\%$). Including foreign direct investment, credit to the private sector, a proper system of transportation, the material price index, imports and exports, and the service sector overall, twelve factors have been dispersed between 0.65 and 0.70, which represents an overall percentage of 60%. So the findings validate that there is a strong impact on economic growth from public sector project delays. In a nutshell, the research findings revealed that the on-time completion of public sector construction projects strongly affects economic growth, which thereby emphasizes the importance of the on-time completion of construction projects. This study further recommends that in order for a project to proceed well and be completed on schedule, sufficient planning should be done before construction begins with the aid of new technology.

KEYWORDS: *Construction industry; economic growth, time delays, on-time completion, wealth creation; project success.*

1 INTRODUCTION

The construction industry is a vast industry that is focused on construction, demolition, renovation, and maintenance. Graham et.al (2011) has defined the construction industry as the most diverse industry which delivers building construction, industrial construction, and infrastructure projects. In building up the climax in the economy, on-time completion of construction projects makes an immense contribution. Manoharan et.al (2015) has highlighted that it is common that Sri Lanka has been experiencing time delays arising in the construction field due to various reasons. When a project is delayed past its completion date, the client suffers a loss of revenue due to the non-availability of production facilities and rentable space. For the contractor, delay leads to a high overhead cost due to the extended period, and the high price of labor, material, plant, equipment (inflation), and so on (Prasad, 2019).

Few researchers have explored the relationship between economic growth and the construction

sector in Sri Lanka. Apart from that, several attempts have been made by the industry experts regarding the project delays in Sri Lanka. From all of them, none of the findings indicate the chemistry between the on-time completion of construction projects and how it affects the economic growth of Sri Lanka as a developing country. Since many public sector construction projects in Sri Lanka go over schedule, this is a pivotal area to study how on time completion of construction projects in the public sector contributes to the economic growth of Sri Lanka.

The aim of this study was to critically appraise the relationship between the on-time completion of construction projects and the growth of the Sri Lankan economy. In line with the research aim, two research objectives were formed as to identify the contributing factors to the Sri Lankan economy and examine the effect of construction project delays in the government sector on factors contributing to economic growth in Sri Lanka.

2 LITERATURE REVIEW

2.1 Delays in the Construction Industry and Impacts Caused by Delay

Construction project delays are common in every country, whether it is a developing or developed country (Soliman, Ehab 2017). In a World Bank study done in 1990, numbers showed that for the 1627 projects finished between 1974 and 1988, the overrun varied from 50% to 80% of the original time. Project completion delays are a significant problem for Sri Lanka's construction sector as well. In particular, in Sri Lanka, government and semi-government projects have a high inclined rate of delivering delayed projects (Sivarajah, 2021).

Delay is a worldwide phenomenon enacted in the construction industry. Sweis et al. (2008) has explained it is a failure of completing the project on time within the fixed budget. On top of all the details, delays in a project can cause many impacts including cost overruns, infeasibility, arbitration, and litigation (Rahaman, A.H. Memon 2011). Since the delay is related to costs and the anticipated budget for a project, realistic construction time is a dominant factor.

As indicated by Arantes De Silva and Ferreira (2015) disputes are likely to arise as a result of the delayed completion date. Additionally, the parties might need to engage in a legal proceeding to resolve delays. In conclusion, both studies have explained the impact of project delays on contractual and cost factors.

2.2 Factors Contributing to the Economic Growth of a Country

Economic growth is the rise or improvement in the market value of goods and services generated by an economy over a specific period, adjusted for inflation.

According to pervasive literature that examines several theories of economic development in Sri Lanka, an economy's growth could come from a variety of sources such as human capital accumulation, productivity improvements, improvements in human capital stocks, enhanced efficiency of the financial market, and improvements in external performance (Kannangara, 2020). One of the most crucial signs of a healthy economy is economic growth. The nation's economy is becoming more productive due to the rising GDP.

Human resources and economic growth have a strong relationship, and it gives a climax to the economy. It helps the economy by expanding the knowledge and skills of the population (Hicks, 1980). Wheeler (1980) has described that human resource development contributes to sustainability growth by increasing physical investment, labour productivity, in contrast to reducing fertility. Lee and Mckibbin (2014) have expounded that the productivity of the service sector eventually supports economic growth by contributing to the sustained and balanced growth of Asian countries. The industrial sector is another major factor in the economic system. Kniivila (2019) has stated that the development and expansion of industries support economic growth by creating massive changes. Sukhadolets et al. (2021) have shown that foreign investment makes a significant contribution to economic development. Furthermore, the study has concluded that economic development is directly correlated with both foreign direct investment and investment in construction. The importance of foreign direct investment as the principal driver of the global economy has been extensively documented in the literature. Inflation can be defined as the rate of price growth over a specific time period. Mamo (2012) has shown that inflation is the most important objective to sustain high economic development.

Export and import is another main factor that supports the economy. Achchuthan (2013) stated that exports and imports have a positive impact on the economic growth of Sri Lanka. The export structure has two categories. They are merchandise exports and service exports. As per the study done by Ajayi LB and Oke MO (2012), moving external debt to economic growth has both a negative and positive impact. Then, in a subsequent study, Sachs and Williamson (1985) demonstrated the role of external debt in the development of infrastructure facilities and the service sector.

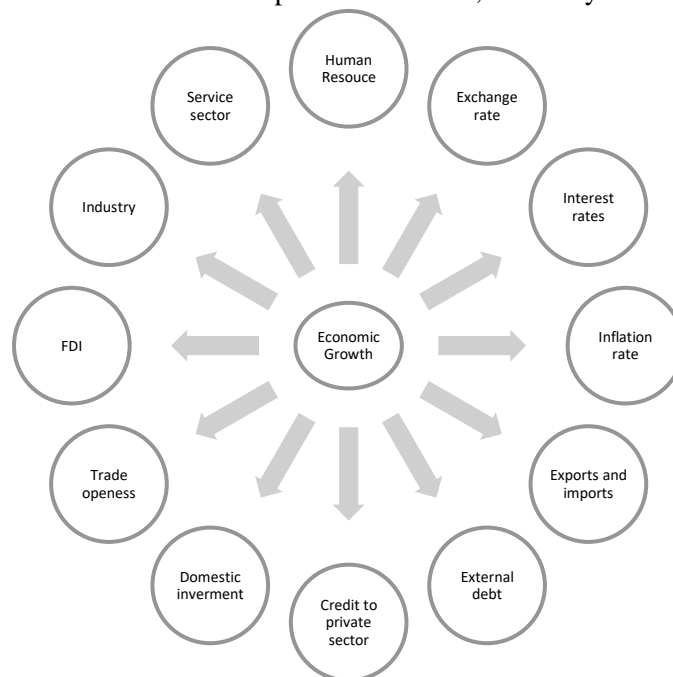
An important financial market indicator, the interest rate has a significant impact on the whole economy. A time of rapid productivity development will usually somewhat offset the long-term expenses associated with a low-interest rate environment. On the other hand, in a time of high-interest rates, the long-term advantages will be countered by slow productivity growth. Singh (2022) explained that interest rates negatively affect economic growth. Chughtai et al. (2015) have cleared the negative impact of the interest rate on the development of a country. Drobyshevsky et al. (2017) have pointed out that interest rates affect the economy in both positive and negative ways. Interest rates have several functions in the economy (Bergo, 2003). It influences inflation, long-term capital accumulation, the potential for economic growth, and many other things. In addition, credit to the private sector has a positive relationship with the economic growth of Sri Lanka (Perera, 2016). Exchange rates affect all citizens, businesses, and governments. Collectively, it can have an impact on inflation, the balance of payments, and investing opportunities. Aslam (2016) has explored the exchange rate as a turning factor in the Sri Lankan economy. Trade openness refers to the direction of an economy, related to foreign trade. Wanogasooriya (2022) has shown that trade openness has a positive relationship with the Gross Domestic Product in Sri Lanka in the short run, while a negative relationship is indicated in the long run. Sayef Bakari (2017) has shown that there is a positive relationship between growth and domestic investments. Figure 1 shows all the factors collectively contributes to the economic growth of a country.

Figure 1. Factors contributing to the economic growth

2.2.1 Importance of the construction industry to the economic growth in Sri Lanka

The construction industry is massive and responsive as well as it compromises with strong linkages with other industries having the highest multiplier effect. The construction industry is just not the infrastructure, it increases productivity and the standard of living by increasing economic growth.

Ramachandra and Rameezdeen (2006) have revealed a positive relationship between economic growth of Sri Lanka and construction output. Furthermore, the study covered Gross Domestic Fixed



Capital Formation respectively and construction output often expands more quickly than the output of other sectors during times of high economic growth.

a) Improved Standard of Living

Olatunji et. al (2020) have clarified that economic growth directly contributes to a rising standard of living. Due to the increase in per capita production of goods and services, there is an increase in per capita consumption of goods and services. The infrastructure can therefore be used for its intended purpose and the economy may benefit when a building project is completed on schedule (Stone, 2017). The ideal indicator would be GDP or GNP per capita, which take into account investments in machinery and industries that raise a country's capacity to produce more and ultimately consume more, raising living standards.

b) Infrastructural facilities extension

Infrastructure is the fundamental, necessary service that must be installed to allow for development (Jodie & Ogunrinola, 2011). Infrastructure can help Sri Lanka's economy develop faster by facilitating it. The Development will be extremely challenging and, in reality, like obtaining a highly rare good that can only be obtained at a very high cost and expense if certain facilities and services are not present. A great deal of theoretical research and practical investigations have been done on the creation and deployment of infrastructures. One of the most significant economic issues in the current academic and policy cycle is the link between infrastructure development and economic growth (Roller and Waerman 2009). The economic expansion entails higher per-capita gross domestic product. The infrastructure supports enhancing sustainable growth. In order to extend the infrastructure facilities, the construction industry is doing an immense service.

2.3 Importance of on-time completion of construction projects to economic growth

On-time completion of projects mitigates cost overruns due to time overruns. In the construction sector, efficient time management and on-time completion are crucial components. On-time completion of a construction project will increase the contractor's opportunities. Furthermore, achieving building goals will be beneficial. Additionally, on-time completion maximizes competence (adobe experience cloud, n.d.). Also, the time delays caused a loss in construction productivity, and the loss of construction productivity highly affected the development of the country (Parviz Ghoddousi, 2010).

Olatunji et. al(2020) have found that on-time completion of public sector building construction projects leads to create socio-economic growth, and wealth creation that improves the standard of living.

2.3.1 Socio-Economic Growth

Due to the significance of the timely project completion to economic development and growth, policymakers have primarily used construction as a tool, and adjustments to the share of public spending going toward construction activity have been a feature of various governments' fiscal policy measures. The contribution of the building industry to national output is the largest (Ruddock and Lopes, 2006).

2.3.2 Wealth Creation

The successful completion of construction projects results in the generation of money, socioeconomic growth, and raised living standards (Scheel, 2007). The literature has extensively emphasized the importance of the public sector to the overall economy. The output of the construction industry is said to be directly correlated with the output of the entire country. Additionally, it is noted that when the economy expands, the output of the building industry grows more quickly than the national output and vice versa (Wells, 2006).

3 RESEARCH METHODOLOGY

To flourish the research objectives, the mixed method approach was followed. Thus, it was decided that a mixed-method approach can give a more comprehensive understanding of the research, which qualitative and quantitative could offer separately.

The research is basically about the effect of on-time completion of construction projects on the economic growth of Sri Lanka. To start with a set of preliminary interviews (5 nr) were conducted among the professionals to be to identify the factors contributing to the Sri Lankan economy. Table 01 shows the profile of the respondents of the preliminary interviews.

Table 1. Profile of Interviews

Code	Designation	Years of experience
R1	Project Manager	24
R2	Ch. Quantity Surveyor	24
R3	Ch. Quantity Surveyor	24
R4	Ch. Quantity Surveyor	10
R5	Ch. Quantity Surveyor	18

Secondly, a questionnaire survey was conducted to examine how the factors contributing to the economic growth in Sri Lanka have been impacted due to the late project completion.

The questionnaire survey comprised three main questions which are related to the factors contributing to the economic growth.

In this questionnaire, questions were grouped into two sections. The first section includes the background information of the participants. The second section is based on how the factors related to economic growth have been impacted due to delays in government building projects. Through the questionnaire, 20 factors were checked and the respondents were asked to rank the impact. Impact levels are indicated in table 2.

Table 2. Likert Scale Answers

1	The impact is negligible.
2	Have less impact.
3	Have an average impact
4	Have a considerably strong impact
5	The impact is very high.

Data collected from the interviews were analyzed using content analysis. The analysis was done using a simple content analysis process. First, data was organized by going through the interview recordings. Data were combined and analyzed discussing the recommendations.

RII (Relative Importance Index) has been used in this study to rank the impact of construction project.

Step of RII analysis

$$\text{Relative Importance Index} = \sum W / AN \qquad \text{Equation 1}$$

W- Is the weight given to each factor by the respondents from 1, 2, 3, 4, and 5 for negligible impact, less impact, having an average impact, having strong impact, and high impact respectively,

A- Highest weight

N- No of respondents

4 DATA ANALYSIS AND DISCUSSION

In this research study, the research population was experienced professionals in the construction industry in Sri Lanka which includes 8.88% project managers, marking 4 project managers. 42.20% was engineers including 19 out of 45 respondents. 46.70% was quantity surveyors including 21 respondents out of 45 respondents. 2.22% was other financial expertise including 1 respondent out of 45 respondents.

The experiences of the survey respondents were categorized into different periods. 24.40% of respondents had experience from one year to five years, marking 12 respondents out of forty-five respondents. 17.40% of respondents had five to ten years' experience, marking 08 respondents. 10 respondents have ten years' to fifteen years' experience which is equal to 20% of the respondents. 37.78% of respondents have more than fifteen years of experience marking 17 respondents.

4.1 Factors contributing to the economic growth in Sri Lanka

The majority of respondents mentioned that “in Sri Lanka, sectors like construction, agriculture, fishery, poultry, and manufacturing are high labor intensive and hence the impact of the contribution of human factors on economic growth is high”. Respondents collectively agreed that to uplift industries and other facilities of Sri Lanka, the service sector has been supporting as an engine. The majority of respondents said that “FDI supports valuable opportunities for Sri Lankan developers while enhancing the economy positively. On trade openness overall idea of the respondents were “Trade openness has the power to spur economic growth by facilitating access to goods and services, improving the effectiveness of resource allocation, and elevating total factor productivity through the spread of information and technology. About the interest rates common idea of the respondents were low-interest rates enhance economic growth while high-interest rates, cause unemployment, low-level investment, and downturn of the economy”. High inflation was commented as a mark of unhealthy economy and high inflation increases the unemployment rate, interrupting investment opportunities and increasing poverty. Common Idea came out from the respondents were A strong exchange rate depressed the economic growth and exchange rate has a significant impact on the economies of nations through interactions with other nations”. Almost all the respondents specified that positive effect of credit to private on the economic growth. The overall idea about trade openness was that it can affected both positive and negative impacts and removing trade restrictions including import and export tariffs and other technical obstacles that offset Sri Lanka's benefits from trade openness”. Majority of respondents clearly pointed out that in Sri Lanka external debt. has played a huge role in developing infrastructure while positively developing the infrastructure.

R1 suggested effective procurement systems, law and order, a proper system of transportation system, and minimization of regulatory protocols as the factors that affect economic growth. R2 explained the significance of having an effective procurement system, foreign policy on government, and the two economic activities. Effective procurement system, law and order were pointed out as factors contributing to the Sri Lankan economy by R3.

Personnel attitudes, material price index, and having an effective procurement system were suggested by R4 the as contributing factors to enhancing economic growth. R5 expounded that the index of industrial production, minimization of regulatory protocols, and ODA as the factors that enhance economic growth.

Starting from regional development to the economic growth of Lanka’s effective procurement system and the proper system of transportation have a significant impact.

Low and order, minimization of regulatory protocols, and foreign policy on government have contributed to the Sri Lankan economy both positively and negatively, while providing run other key activities of the economy. Together with the Index of industrial production, the material price index, and ODA have contributed starting from the low level of the economy to the national economy positively.

The analyzed facts of the study show the impact of the contributing factors to Sri Lankan economic growth. Nine factors contributing to the Sri Lankan economy could be newly identified through the interviews. Effective procurement system, proper system of transportation, minimization of regulatory protocols, index of industrial production, ODA (open direct investment), law and order, material price index, foreign policy on government were among the highlighted factors.

Human resources was the only factor removed after the experts’ ideas pointed out in the interview discussion.

4.2 Impact of delay in project completion on the factors contributing to the economic growth in Sri Lanka

From the literature, twelve (12) factors were identified as the factors that support economic growth. They are human resources, interest rates, FDI (Foreign direct investment), exports and imports, credit to the private sector, external debt, industry, service sector, inflation rate, exchange rate, trade openness, domestic investment. Human resource was removed from the interviews and eleven 11 factors from literature and nine 9 factors from expert interviews, all together 20 (twenty) included in the questionnaire survey.

Respondents were asked to rate the impact of project delays on the factors influencing Sri Lanka's economic growth.

Based on the RII values obtained from the analysis, the factors contributing to economic growth were categorized as highly impacted, averagely impacted, and lesser impacted factors. Considered impact level as follows.

- ❖ Low impact (RII<50%)
- ❖ Average impact (50 % < RII < 70%)
- ❖ High impact (RII>70%)

Table 3 shows the calculated RII values of the contributing factors to the economic growth.

Table 3. RII Value of the Contributing Factors to Economic Growth of Sri Lanka

Factors	RII index	Rank
Factors that have a high impact		
Foreign Direct Investment	0.72	1
Credit to Private Sector	0.72	2
A proper system of transportation	0.71	3
Material Price Index	0.71	4
Imports and Exports	0.71	4
Factors that have an average level of impact due to project delays		
Service Sector	0.68	6
Domestic Investment	0.68	6
Exchange rate	0.68	8
Effective Procurement System	0.67	9
Interest rates	0.66	10
Inflation rate	0.66	11
Industry	0.65	12
Foreign policy on government	0.63	13
Index of industrial production	0.62	14
ODA to GDP	0.62	14
Personnel attitude of the people	0.61	16
Trade openness	0.61	17
External debt	0.58	18
Factors have a low-level impact due to project delays		
Minimization of regulatory protocols	0.48	19
Law and order	0.44	20

As per the analysis of the questionnaire findings, FDI, credit to the private sector, proper system of transportation, material price index, imports and exports are the factors that have been highly impacted due to the late completion of government sector construction projects. The overall analysis shows that among the factors that spur the economy, foreign direct investment, and credit to the private sector is the highly impacted with RII=0.72, followed by a proper system of transportation, the material price index, and imports and exports similarly with RII of 0.71. The findings of the research emphasized that the FDI is the highly impacted factor. The reason may be the investment-driven nature of most of the public sector construction projects in Sri Lanka. With a delayed completion, investors might change their ideas and decide not to invest in future projects. E.g.: most of the expressway projects.

Credit to private sector is a major factor which have a major lead to the economic growth of Sri Lanka. It is about the financial resources provided to the private sector through loans, purchases of non-equity securities, and other trade credits and other account receivables. When a project slips over the date of completion, it affects the trade credits and loan schemes separately.

Development of transportation system take place in a socioeconomic context. The highly transactional and service oriented functions of main transport activities underline the complex relationship between its physical and human capital needs. When transportation systems are deficient

in terms of capacity and reliability due to project delays they can have and economic cost such as reduced or missed opportunities and lower quality of life.

Project delays have a high impact on imports and exports. With the delayed completion of the public sector production complex, they cannot do the exports on time within their timelines. Similarly in imports, with the delays of the public sector construction project, it is difficult to order the materials and their price can be changed.

Out of the thirteen factors in the average category, there are seven factors which are having RII index from $6.50 < RII < 7.00$. It seems they have been considerably impacted due to the delays in the completion of public-sector construction projects. As a percentage of total factors, it is 35%. The service sector has a significant impact on the economic growth of Sri Lanka. With the delays there will be definite shortages in the service sector. As an example delays in a hotel project can be considered. In addition, delays break the efficiency of the procurement system. The majority of public-sector construction projects are based on external debts. The projects are funded through the World Bank, Asia Development Bank, etc. With the delayed completion they lose the profit margins and expected return on investment. The service sector and domestic investment have RII value-0.684, while the exchange rate is impacted by RII value-0.68. Under the average category effective procurement system has been impacted by RII-0.67. The impact on the interest rates is RII 0.66.

The following Figure 4 shows the relative importance of factors contributing to the Sri Lankan economy.

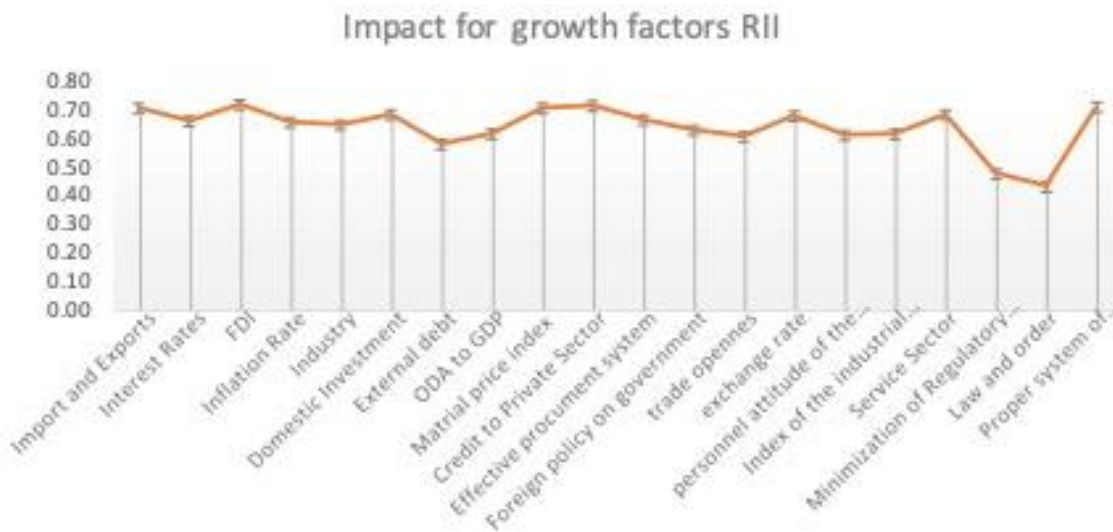


Figure 4. Impact for growth factors

Only two factors out of twenty factors have been ranked as the less impacted and as a percentage, it can be presented as 10%. Same as the other factors minimization of regulatory protocols and law affect the economic growth and however, those have been less impacted from delay completion of public sector construction projects. Sometimes regulatory protocols and law have to amend to continue construction on delayed projects.

Since the majority of the factors from averagely impacted factors have expanded between the RII value of 0.65 and 0.70 altogether 12 factors out of 20 have spread out in between the RII range of 0.65 and 0.72. As a percentage, it can be presented as 60%. Since 60% of the factors have spread out between 0.65 and 0.72 there is a strong impact from the delayed completion of public sector construction projects to the factors contributing to the economic growth in Sri Lanka.

. Therefore, these findings clearly indicate that on-time completion of construction projects is important to enhance the economic growth of Sri Lanka.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

A county's economic growth is spurred by a number of factors. Identifying the factors contributing to economic growth in general was carried out in the literature review and their validity in the Sri Lankan context finding more factors related to the Sri Lankan context were done through interview data.

The factors listed in table 3 were identified as related to the Sri Lankan context.

Table 3. Factors Contributing the Economic Growth

From literature	From Interviews
Inflation Rate	Effective procurement system
Interest Rates	Open direct assessment
Exchange Rates	Material price index
Exports and Imports	Index of industrial production
FDI	Minimization of regulatory protocols
Trade openness	Law and Order
External debt	Foreign policy on government
Credit to the private sector	Personnel attitude of the people
Service sector	A proper system of transportation
Industry	
Domestic Investment	

According to the study's findings, the relationship between on-time completions of public sector building projects has a significant impact on the factors contributing to the economic growth in Sri Lanka.

Foreign direct investment and credit to the private sector have been highly impacted due to the delays in project completion ($RII=0.72$), followed by an efficient transportation system, the material price index, and imports and exports, which have a similar impact ($RII=0.71$).

Impact factors of the service sector, domestic investment, exchange rate, effective procurement system, interest rates, inflation rate, and industries range between RII value, $0.65 < RII < 0.70$. The industry sector, foreign policy on government, index of industrial production, ODA to GDP, personnel attitude of the people, trade openness, and external debt have been averagely impacted and the values range between $0.50 < RII < 0.65$.

Two of the twenty factors have been identified to be the least influenced, accounting for 10% of the total. Six factors from the averagely impacted factors are distributed between 0.50 and 0.65, accounting for 30% of the total. The majority of the factors (seven factors) from the averagely impacted factors have impact levels in between RII values of 0.65 and 0.68. As a result, a total of 12 of the 20 components have scattered in the RII range of 0.65 to 0.72. It can be represented as a percentage of 60% of the total number of factors.

These findings suggest that the delayed completion of public-sector construction projects has a significant influence on the factors contributing to the economic growth in Sri Lanka. As a result, it can be argued that the timely completion of construction projects is critical to enhancing Sri Lanka's economic growth.

5.2 Recommendations

The study emphasized a positive relationship between on-time completion of public sector construction projects and economic growth of Sri Lanka.

Based on the study, it can be recommended that careful project planning for public sector construction projects should be done before construction begins to ensure that everything will go as planned and the project will be completed on time. Additionally, contractors need to be familiarized with the construction site for them to understand the topography and prevent problems from unforeseen ground conditions. To avoid overruns and complete the building on time, cost and time should be used as efficiently as possible.

Apart from that, this study has identified that it is essential to minimize public sector construction project delays to enhance the economic growth of Sri Lanka. To minimize time delays in public sector construction projects, proper project planning, scheduling, adoption of BIM technology, proper site management, and supervision, and frequent progress meetings can be recommended. Moreover, the study endorses financial controlling, labor management, revising schedules, and material equipment control to minimize and control the public sector construction project delays in Sri Lanka and thereby minimize the effect on the factors contributing to the growth of national economy.

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