



## Cost Benefit Analysis (CBA) of Semarang - Solo Toll Road Infrastructure Development

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### Abstract

The economic growth of Central Java Province in the fourth quarter of 2018 - the first quarter of 2019 experienced a slowdown. During this period, the economic growth in the Java region also showed a slowdown, namely in the first quarter of 2019 by 5.66% (yoy). The economic growth of Central Java Province in the first quarter of 2019 was recorded at 5.14% (yoy). The use of the Public Private Partnership (PPP) concept can be seen as an opportunity to improve the quality of expense both at the Central Government and in the Regional Government. This study aims to analyze the Public private partnership model and the costs as well as benefits of providing the Semarang - Solo toll road infrastructure. The method used in this research was mixed methods. The research results show that The form of cooperation for Semarang-Solo Toll Road is Build Operate Transfer (BOT), the actors of the collaboration are PT Jasa Marga (Persero) Tbk, PT Astra Infra and PT SPJT (PT. Sarana Pembangunan Central Java). Management time for 45 years with a higher Return On Investment (ROI) value in 2018 reaching 6.61%, the better the construction of Semarang-Solo toll road infrastructure and this affects the payback period of investment, which is 7 years.

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## INTRODUCTION

Economic growth means the development of the production of goods and services that prevail in a country, such as the increase and the number of industrial goods production, infrastructure development, the increase in the number of schools, increased production in the service sector, and increased production of capital goods.

**Table 1.** Provincial Economic Growth in Java Region (% , yoy)

Provinsi	TW IV 2018	TWI 2019
DKI Jakarta	6.41	6.23
Banten	5.98	5.42
West Java	5.50	5.43
Central Java	5.28	5.14
DIY	7.39	7.50
East Java	5.65	5.51
Java	5.82	5.66
Indonesia	5.18	5.07

Source: BPS, 2019.

The economic growth of Central Java Province in the fourth quarter of 2018 - the first quarter of 2019 experienced a slowdown. During this period, the economic growth in the Java region also showed a slowdown, namely in the first quarter of 2019 of 5.66% (yoy).

The slowdown of the economic growth in Central Java in the first quarter of 2019 originated mainly from foreign exports along with weakening foreign demand. Furthermore, the slowdown in foreign imports, especially in the form of oil and gas, has an impact on the limited raw materials for industrial activities that provide greater added value, so that this has an impact on the restriction of export performance between Central Java regions. The slowdown in net exports between regions causes the contribution of this component to drop significantly relative to the economic growth of Central Java. On the other hand, the domestic demand monitored to be quite strong. This is reflected in the growth of household consumption component, consumption of non-

profit institutions serving households (LNPR), and government consumption, which records improvement in the reporting quarter. Furthermore, investment is also recorded to have grown higher than in the fourth quarter of 2018 (Bank Indonesia, 2019), can be seen from the table 1.2:

**Table 2.** Economic Indicator in Central Java Province (ton)

	TW IV 2018	TW I 2019
Foreign Exports	7.12	3.45
Foreign Imports	21.73	6.12
Net Exports	137.59	5.74
between regions		
Non-Oil and Gas	2.036	1.22
Export Value		
Non Oil and Gas	805	2.109
Export Volume		

Source: Bank Indonesia, 2019

Infrastructure development focuses on expanding connectivity between regions and economic resources in order to reduce inequality and improve economic justice. As a country that has a large number of islands and population, Indonesia has to build a lot, must increase and extend its roads, toll roads and others (Directorate of State Financial Risk Management, 2017).

Based on a survey produced in the World Competitiveness Report 2018, it shows that the quality of Indonesia's infrastructure is still low when compared to other Southeast Asian countries, even from neighboring countries, namely Malaysia. In table 1.3 shows the ranking of ASEAN countries in infrastructure 2018, in that table the World Economic Forum becomes 6 (six) parts of infrastructure, namely, electricity supply, transportation, ports, roads, transportation and overall transport in world ranking. In table 1.3 then US countries to increase the economic growth especially in Central Java, the Government is investing heavily, one of which is in the toll road infrastructure sector, EEA which is included in the assessment of the World Economic Forum.

**Table 3.** Ranking of ASEAN Countries in Infrastructure Provision in 2018 According to the World Economic Forum

CONTRIES	INFRASTRUCTURE TYPES (in score)						WORLD RANKING
	Electricity Supply	Air Transportation	Port	Street	Rail Transportation	Overail Transport	
Singapore	6.9	6.9	6.7	6.3	5.9	6.5	2
Malaysia	5.9	5.7	5.4	5.3	5.0	5.5	22
Thailand	5.2	5.2	4.3	4.3	2.6	4.7	43
Indonesia	4.4	4.8	4.0	4.1	4.2	4.5	52
Brunei	5.4	4.5	3.9	4.8	N/A	4.3	60
Vietnam	4.3	3.8	3.7	3.4	3.0	3.9	79
Philippines	4.2	2.9	2.9	3.1	1.9	3.4	97
Laos	4.8	3.8	2.8	3.3	N/A	3.3	102
Cambodia	3.5	3.7	3.7	3.4	1.6	3.1	106
Myanmar	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: World Economic Forum, 2018

Note: Myanmar is not included in the ranking, N / A: Data not available

## METHOD

This study used a mixed method by combining qualitative and quantitative in order to complement each other the description of the study result about the phenomenon under study and to strengthen the research analysis (Sugiyono, 2011). The focus of this research in this qualitative approach to answer the first problem formulation was the model of provision and management of the Semarang - Solo toll road by observing the Public private partnership Model unit in the provision and management of Semarang - Solo toll road infrastructure. Data collection techniques that will be carried out are by using three techniques at once, namely interviews, observation, and documentaries.

Analyzing the costs and benefits of providing Semarang - Solo toll road infrastructure using a quantitative approach with data analysis techniques of Return on investment and payback period. Analyzing research to be able to answer the second problem formulation by using investment appraisal, Return of investment and payback period. Payback period is the time period required to return the investment value through the revenues generated by the investment project.

## RESULTS AND DISCUSSIONS

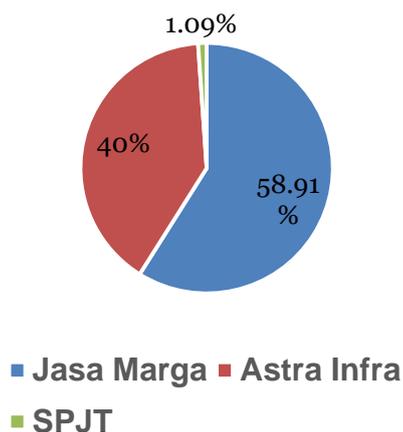
The form of cooperation for the Semarang-Solo Toll Road is the Build Operate Transfer (BOT) agreement. The actors in the collaboration for the construction of Semarang-Solo Toll road infrastructure are PT Jasa Marga (Persero) Tbk, PT Astra Infra, and PT SPJT (PT. Sarana Pembangunan Central Java). Management time for 45 years for the construction of the Semarang-Solo Toll Road, consisting of the asset types of the Semarang - Solo Toll Road Section 45 years (concession period), Supplementary Buildings of the Toll Road for 20 Years, Guard Rail (fence) & Similar Security Facilities for 10 years, Other Toll Road Equipment for 10 years, Toll Road Lighting Facilities for 10 years, and Toll Gate Electrical Installations & Facilities for 10 years.

In the handover stage, the deadline for the build operate transfer (BOT) agreement is not stipulated in a standard manner in the provisions of the law. After the concession period ended, which is 45 years for the Semarang-Solo toll road, the cooperation carried out in the construction of the Semarang-Solo toll road benefits the government in providing public facilities, especially the Semarang-Solo toll road.

The organizational structure at PT Trans Marga Central Java uses a line system that is commonly used in simple and small institutions or companies. Based on the description, it can be

concluded that the organizational structure aims to determine the relationship between functions, parts or positions as well as authority and responsibility in an organization and is used as a benchmark to assess how the responsibility and authority of each section.

PT Trans Marga Jateng (TMJ) was formed in 2007 in accordance with the Company Establishment Deed No. 84 of 2007. PT TMJ is the concession owner of the Semarang-Solo toll road of 72.64 km long with a concession period of 45 years. PT TMJ is a joint venture of PT Jasa Marga (Persero) TBK together with PT Sarana Pembangunan Jawa Tengah (PT SPJT) with share ownership, as follows (source: Trans marga JATENG, 2019): The shares owned by PT Jasa Marga (Persero) Tbk. by 50.91%, PT Astra Tol Nusantara (ASTRA Infra) by 40%, PT Trans Optima Luhur 8.00%, and PT Sarana Pembangunan Jawa Tengah (PT SPJT) 1.09%.



**Figure 1.** shares owned Trans marga JATENG  
Source: Trans marga JATENG, 2020

Trans Marga JATENG in managing the Semarang-Solo Toll Road is required to reach Financial Close within a period of no later than 6 (six) months from the Effective Date. The funding is contained in Article 5 of the PPJT for the management of the Semarang-Solo Toll Road. PT. Trans Marga JATENG in submitting a valid copy of the Borrowing Agreement to PT. Jasa Marga without charging PT. Jasa Marga, within 30 (thirty) days from the achievement of Financial Close. To the government's knowledge, PT. Trans Marga JATENG in managing the Semarang-Solo Toll Road and lenders can open a special account to save funds, which are obtained from the capital of PT. Trans Marga JATENG in managing the

Semarang-Solo Toll Road and / or from loans and assignments of third parties to Independent Checking Engineers who are authorized to examine the use of funds in the account for Construction.

**Cost Benefit Analysis**

**A. Return Of Investment (ROI)**

**Table 4.** Calculation Return Of Investment (ROI)

Years	Net Profit After Tax	Total Asset	ROI (%)
2010	3.389.051.430	2.213.006.714.522	0.15
2011	17.488.402.481	1.781.740.939.154	0.98
2012	138.150.926.786	2.682.556.359.298	5.15
2013	161.962.127.692	3.407.470.487.494	4.75
2014	226.151.065.309	3.725.251.372.846	6.07
2015	180.152.381.868	4.038.493.666.571	4.46
2016	142.263.681.642	5.604.826.991.567	2.54
2017	262.258.041.230	6.237.975.619.604	4.20
2018	419.262.505.122	6.347.295.256.507	6.61

Calculation Table of Return Of Investment (ROI)

Explanation: Net Profit and Total assets (in million rupiah).

Based on table 2, Return on Investment has an average value of 0.03879696. The minimum value of Return on Investment is 0.15%. Meanwhile, the maximum value of Return on Investment is reached a maximum value of 6.61%. Return On Investment (ROI) of Trans Marga JATENG Semarang in 2010 was worth 0.15%. This is since the company's net profit is greater than its total assets.

In 2014, Return On Investment (ROI) of Trans Marga JATENG Semarang increased by 6.07%. An increase of 6.07% from the previous year, the increase in Return On Investment (ROI) is influenced by the company successfully establishing cooperation. The implementation of Good Corporate Governance (GCG) is a key aspect in the success of company management to overcome problems in 2010 so that in 2011 Trans Marga JATENG Semarang succeeded in increasing Return On Investment (ROI) and then 2018 Return On Investment (ROI) of Trans Marga JATENG Semarang rose 6.61% from the previous year.

**B. Payback Period**

This method calculates how fast the investment is made in each period. The

investment costs for the Semarang-Solo toll road can be seen in table 5 below:

**Table 5.** Payback Period

n	a	b	c	pp
7	819484	811827	994772	7.041854109

Explanation:

n = The last year in which the amount of cash flow still cannot cover the initial investment

a = Total initial investment

b = The cumulative amount of cash flows in year ken

c = The amount of cumulative cash flows in year n+1

Or  $c - b =$  total cash flow in year n+1

Based on the calculation result, the Payback Period for investment capital is 7 years from the opening of the Semarang-Solo toll road to the public. The results of this analysis are expected to have alternatives with a shorter period. The use of this analysis is only recommended to obtain additional information to measure how quickly the return on invested capital is.

## CONCLUSIONS

The form of cooperation for the Semarang-Solo Toll Road is the Build Operate Transfer (BOT). The actors of the collaboration are PT Jasa Marga (Persero) Tbk, PT Astra Infra and PT SPJT (PT. Sarana Pembangunan Jawa Tengah). Management time for 45 years with a higher Return On Investment (ROI) value in the year 2018 reached 6.61%, the better the construction of Semarang-Solo toll road infrastructure and this affects the payback period for investment capital which is 7 years.

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