An Analysis of the Effects of Electrical Energy Distribution on the Economic Growth of Kota Medan

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Abstract- The Electrical power distribution is both crucial and critical in Medan, Republic of Indonesia. With the expansion of the city, the energy demand rises at the unprecedented rate, sixty percent above the originally planned five years ago, in some of rapid industrially growing regions. As such, this study aims to determine, assess and analyze the distribution of electrical power in the city of Medan. Also, a study was undertaken to determine, assess and analyze the effect of the electric power distribution to local economic growth in Medan; method used in this study is quantitative descriptive using SEM. The data collection techniques used in the form of questionnaires, observation and documentation. Analysis of the data used is descriptive and verification, where verification studies conducted by testing the hypothesis that test the causal relationship between exogenous variables on endogenous variables. Based on the results shown that (1) electric power distribution in the city field based on the perception of employees are in the range of categories quite agree in terms of both, but in different real conditions, which occur due to the availability of rolling blackouts that there cannot meet, (2) effect electric power distribution positive and significant on economic growth area. This gives a general description that the distribution of electric power as economy capable of supporting a sizeable impact on economic growth, it is almost because various industrial and business activities currently in need of electrical power so it becomes a major component in terms of the economy.

Keywords: Electric Power Distribution, Economic Growth.

Introduction

Electric power distribution has been extensively studied in all references given in this paper. However, no study is done for the City of Medan which for the last six years has been repeated electricity black-outs due to acute shortage of electricity supply. Under this constraint, a study has been conducted to establish the effects of electricity distribution on the economic growth in Medan. Sibarani (2002) as in Fig. 1 shows the effects of electricity distribution on the regional economic growth. However his study had also not covered the regional expansion of the City of Medan.

With the plan that Medan should grow industrially and the population should not experience black outs as frequent as it is now on average three (3) hours per day, it as of paramount importance that a conclusive study be carried out to establish this (electric energy distribution's impact on economic growth).
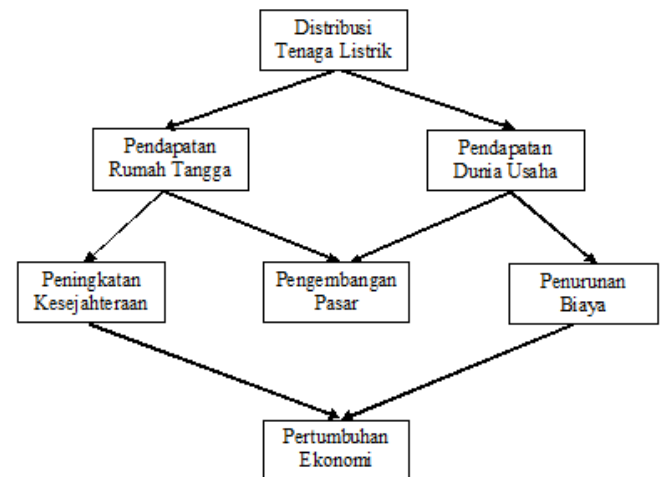
Distribusi Tenaga Listrik = Electrical Energy distribution, Pendapatan Rumah Tangga= Household income, Pendapatan Usaha = Business Income, Peningkatan Kesejahteraan= Inprovement of well being, Pertumbuhan Ekonom=Economic Growth

Fig.1. Infrastructure's effects on economic on economic growth (Ref: Sibarani, 2002)

We examine the consumers as in Fig. 2.
In 2006 there were 385.775 consumers, from 419.988 families, while in 2011 there were 481.336 consumers from 512.875 families. The distribution is not homogeneous and not evenly distributed.

Fig.2. Graphical Comparison between total families and electric energy consumers in Medan.
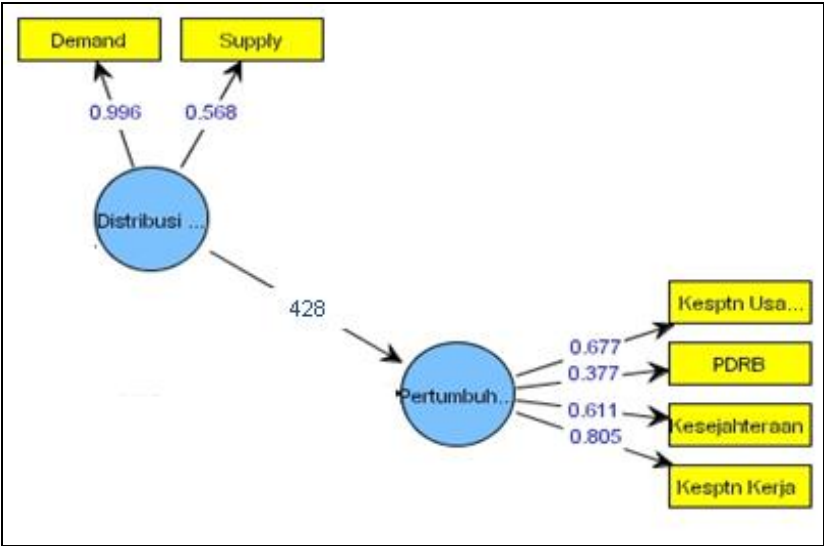

Fig.3. Structural Equation Modelling (SEM) Model

Modeling

Structural Equation Modelling is used in this project for establishing the relationship between variables, electric power distribution and economic growth in the city of Medan.

Structural Equation Model (SEM) is based on Fig. 3.

Where we obtain $\eta = 0,428^{*}\xi + Errorvar = 0,163, R^2 = 0,416$

Results

TABLE.1. Test on the influence of Electric Power Distribution on the Economic Growth in Medan

Structural	Coefficient	$t_{calculated}$	t_{table}	Description
$\rho\eta_2\xi$	0,183	6,887	1,971	Ho is rejected: positive and significant between electric distribution (η_1) on regional economic growth (η_2)

Based on the above table, we establish that electric distribution has a significant influence (0,183) on regional economic growth (6,887>1,971).

Conclusion

Detailed study as in Junaidy's thesis is now summarised as follows: Across the board covering all levels of population, it is established that the electric power distribution is no doubt both crucial and critical for economic growth in the City of Medan. Therefore, it is necessary to plan the distribution of electrical energy in the light of continuous regional planning for Medan's development. The blackout scenarios are no more welcome if the Medan plans to grow industrially and economically.

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