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Economic Analysis of Poverty Alleviation through Fishery Resources Utilization in Makassar City Coastal Region

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ABSTRACT
This study is conducted aiming to analyze a model through the improvement of human resources quality, the availability of production tools, the existence of local culture and the improvement of economic capability in alleviating poverty and to analyze the implementation of fishery resources variables used to alleviate poverty of coastal communities. This research is done in coastal region of Makassar City. The period used in this study is 4 (four) months. The population in this study is all fishermen categorized in poor. The number of samples is determined by purposive quota sampling to those with poor criterion as described in the background, and based on Slovin formula, the sample is 99 respondents. This analysis technique is used in this study is Partial Least Square (PLS). The result shows that total determination coefficient is 80.84%. This indicates that data variability which is able to be explained by the model is equal to 80.84%, or in other words, the information contained in the data can be explained as many as 80.84% by the model. The result also gives evidence that the improvement of human resources quality, the availability of fishing gears and the existence of local cultures have influence on economic capability and economic capability influences significantly in reducing the number of families under the poverty line.
Keywords: Partial Least Square (PLS), Economic Capability, Quality Improvement, Local Culture, Poor Families

1. Introduction

Poverty is a portrait of a complex and multidimensional phenomenon. Poverty is a chronic problem that has began since the 1960s and the condition was worsened by economic crisis hitting most Asean countries including Indonesia since the middle of 1997 (Multifiah, 2007). Concerning to that situation, the data of Susenas state that the number of poor people in Indonesia got increased in 2004 until 2006, and then it decreased in 2007 until 2010.

Related to the urgency of poverty problem, Poli (2008) has done a study stating that during the New Order regime, Indonesia's development focuses on Economic Development, which is characterized by standardizing high GDP level per capita every year. This pattern is still conventional since it aims to create "trickle down effect" of the development yield to the society widely. Since the government kept focusing on economic growth has made other social problems arisen as something “forgotten”, such as poverty, unemployment, inequality in income distribution, and environmental damage. On the other hand, from external factors, various poverty alleviation programs developed and rolled out by the government is often temporary and the program often positions the society as an object that does not have entrepreneurial potential. Poverty is seen only from economic point of view, then if there is poverty problems happening in many communities, it is often assumed as homogeneous (uniform) problem and to be easily solved by merely relying on venture capital funding.

The development done needs innovation by studying the factors causing poverty in society. For instance, fishery industry that was once considered as inexhaustible resource and these days people do realize that fishery industry is in crisis position (Mc Goodwin, 2001). When this problem is interrelated with the poverty issue, then the new issues faced by coastal communities today are the problem of natural and and human resources management and utilization has not been well managed and able keeping in sustainability. This is caused by the low quality of human resources, because they are not yet equipped with attitudes and skills of informal activities such as strategies in survival (Giovanni, 2005)

Based on the explanation above, the objectives of this study are to analyze a model through the improvement of human resources quality, the availability of production tools, the existence of local culture and the improvement of economic capability in alleviating poverty and to analyze the implementation of fishery resources variables used to alleviate poverty of coastal communities.

2. Literature Riview.

Causes of Poverty rises in the theory of the vicious cycle of poverty that includes six elements, backwardness, underdevelopment, low investment, low productivity, low savings, low real income (Nurkse, 1953). Vulnerability can be seen from the inability of poor families to provide something to deal with the situation

Natural disasters such as the arrival of emergency or illness that befell the family. Vulnerability can be seen from the inability of poor families to provide something to deal with the situation Natural disasters such as the arrival of emergency or illness that befell the family.So far, the efforts made by the Government to mitigate or remove kemiskianan include formulating standard poverty line and compiled the maps kemiskinan.Namun pouch Thus, during this aprouch government in addressing poverty at both national , regional and local general approach is to apply a purely economic seringkalai ignore the role of culture in the context of local kearipan (Karnaij , et al 2000) . Economic backwardness of a
country or society is not only influenced by religious beliefs and customs attitude to life but also dipengeruhi by other variables such as culture (Arraiyah , 2007) . UNDP approach is relatively more konprehensip they include not only the economic dimension but also education and health pivot on pembangunanyang paradigm combines the concept of meeting the basic needs of Paul Streeten and capability theory developed by Amarta Sen (1998)

3.Methodology

Partial Least Square (PLS) was first developed by Herman Wold, he was the teacher of Karl Joreskog, who developed SEM. This model was developed as an alternative for situation in which the theory needed is weak and or indicators available do not meet the measurement of reflexive model. Wold calls PLS as "soft modeling". PLS is a powerful method of analysis because it can be applied at all data scales, does not require a lot of assumptions and sample size does not have to be large. PLS can be used not only to confirm the theory but also to build the relationships that have no theory underlying to be studied in advance and also to test the propositions (Solimun *et al.*, 2009).

PLS approach is based on analysis shift of the estimation measurement of research model parameter on relevant measurement predictions. So the focus should be shifted from only estimation measurement of significance parameter (structural paths and the loading factor) into the prediction validity. The basic testing of significance parameter is resampling (repeated sampling) developed by Geisser (1975) and Stone (1975) with sample predictive technique, that are the synthesis of cross-validation (cross-validation) and function perspective conformity that should be observable or potential observable and this is much more relevant than the artificial estimation of construct parameter (Chin, 1997). PLS aims mainly to estimate the variance of endogenous construct and its variables manifest, it is known as reflexive indicators, with other specificity is construct indicators can also be formed formatively, it is known as formative indicators.

Compared with SEM approach that has been widely used (by applying LISREL and AMOS software), PLS is able to avoid two serious problems, that are:

a) The inadmissible solution, this happens because of the variance-based of PLS instead of covariance, so the matrix singularity problem will never happen. In addition, working on the PLS structural model is recursive, so the problem of un-identified, under-identified or over-identified will not occur.
b) The indeterminacy factor, which is the existence of more than one factor contained in a set of variable indicators. Specially for the indicators that are formative, it does not require any comon factors so that composites latent variables will always be obtained. In this case, the latent variable is linear combinations of its indicators.

The main differences of those two approaches is whether structural equation model is used for testing and theory development or for prediction purposes. For the situation in which the underlying theory is strong and its main purpose is testing and developing a model so that the approach of full information estimation method based on covariates (e.g. Maximum Likelihood or Generalized Least Square) used in SEM is the most appropriate method. This indicates that SEM mainly concerns in testing the theory has great emphasis on structural relationships (i.e. parameter estimation). But if there is uncertainty ofscore factor prediction (factor indeterminacy) then it will cause a decrease in prediction accuracy (Chin, 1997).

PLS is a more appropriate approach for prediction purposes, it is mainly on the conditions in which the indicators are formative. With latent variable as the linear combination its indicators, the predictive value of the latent variables can be easily obtained, so that the prediction on latent variable affected can also be easily done. In contrast to SEM, since the indicator is reflexive so that it is difficult to assess changes latent variable values and in consequences the prediction is hard to be done.

Through this approach, it is assumed that all calculated variants calculated are useful for the explanation. The approach of latent variable estimation in PLS is as exact linear combinations of indicators, so it is able to avoid indeterminacy problem and generate appropriate score component. By using an iterative algorithm consisting of several analysis with ordinary least squares method (ordinary least squares) then identification is not a problem because the model is recursive.

PLS approach is based on the analysis shifts from estimation measurement of parameter model relevant prediction measurement. So the focus of analysis moves from only an estimation and interpretation of parameter

significance into the validity and accuracy of prediction.

The basis used is resampling developed by Geisser & Stone. So that the sample size in PLS may be small, with the estimation as follow:

1) Ten times of the scale with the largest number of formative indicators (ignoring reflexive indicators)
2) Ten times of the structural paths that lead to a particular construct in structural model.

In PLS, latent variables could be a result of its indicator reflection, usually known as refletive indicator. In addition, formative construct can be also formed by its indicator, usually known as formative indicators.

Covariance-based SEM with AMOS or LISREL software can only be able to complete structural equation model in which the latent variable is measured by reflexive model. While construct with reflexive and formative models can be solved by structural equation modeling with variance-based which is PLS, with SmartPLS computer programs (Solimun, *et al.*, 2009).

The steps in testing the empirical research PLS-based model with SmartPLS software (Solimun *et al.*, 2009 and Chin, 1997) are as follow:

The PLS analysis result can be seen graphically as below

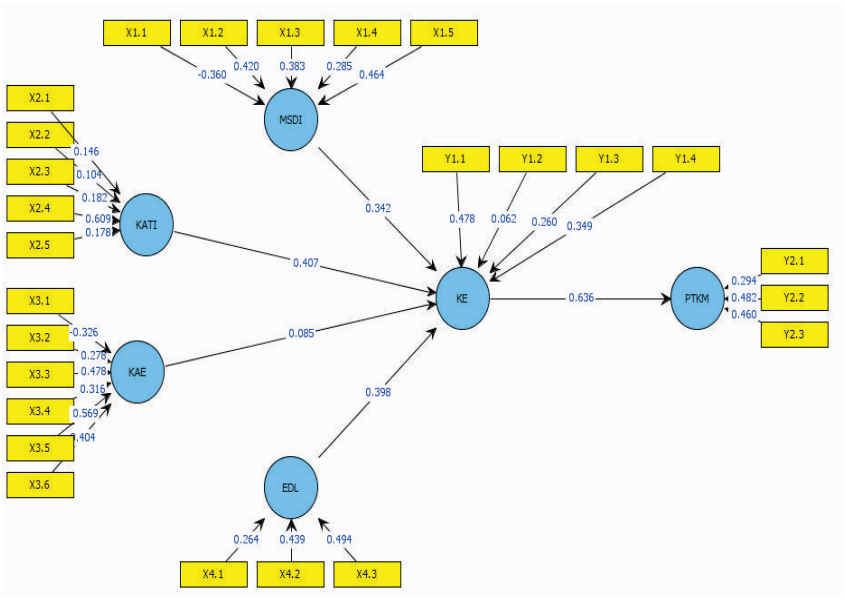

Figure 1. PLS Mediation Analysis Result

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1.Specifications Model

Analysis of variables relationship path consists of:

a) Outer model, the specification of latent variable and its indicator relationship, also called as outer relation or measurement model, that defines construct characteristics with its manifest variable. Model indicators reflexive equation can be written as follows:

$$x = \Lambda_x \xi + \varepsilon_x$$
$$y = \Lambda_y \eta + \varepsilon_y$$

Where x and y are the indicators for the latent exogenous variables (ξ) and endogenous (η). While Λ_x and Λ_y is loading matrix that describes such simple regression coefficient linking latent variable to its indicators. Residual measured by ε_x and ε_y can be interpreted as a error measurement or noise.

Formative indicator model equation can be written as follows:

$$\xi = \pi_\xi x + \delta_x$$
$$\eta = \pi_\eta y + \delta_y$$

Where ξ, η, x, and y are equal to the previous equations. π_ξ and π_η are like multiple regression

coefficient from the latent variable on its indicators, whereas δ_x and $\delta_y$are regression residuals.
In the picture of PLS above, outer model or measurement model is obtained from the explanation below:

- The Improvement of Human resources Quality (X1) with reflective indicators

$$X_{11} = \lambda_{11}X_1 + \delta_{11}$$
$$X_{12} = \lambda_{12}X_1 + \delta_{12}$$
$$X_{13} = \lambda_{13}X_1 + \delta_{13}$$

- The avalailability of Fishing Gears variable (X2) with reflective indicators

$$X_{21} = \lambda_{21}X_2 + \delta_{21}$$
$$X_{22} = \lambda_{22}X_2 + \delta_{22}$$
$$X_{23} = \lambda_{23}X_2 + \delta_{23}$$

- The Economic Capability variable (Y1) with reflective indicators

$$Y_{11} = \lambda_{31}Y_1 + \delta_{31}$$
$$Y_{12} = \lambda_{32}Y_1 + \delta_{32}$$
$$Y_{13} = \lambda_{33}Y_1 + \delta_{33}$$
$$Y_{14} = \lambda_{34}Y_1 + \delta_{34}$$
$$Y_{15} = \lambda_{35}Y_1 + \delta_{35}$$

- The Reduction of Poor Familles latent variable (Y2) with reflective indicators

$$Y_{21} = \lambda_{41}Y_2 + \delta_{41}$$
$$Y_{22} = \lambda_{42}Y_2 + \delta_{42}$$
$$Y_{23} = \lambda_{43}Y_2 + \delta_{43}$$
$$Y_{24} = \lambda_{44}Y_2 + \delta_{44}$$
$$Y_{25} = \lambda_{45}Y_2 + \delta_{45}$$
$$Y_{26} = \lambda_{46}Y_2 + \delta_{46}$$

b) Inner model (structural model) is the specification of latent variables relationship (structural model). In the picture of PLS model above, the inner models obtained are as follow:

$$Y1 = \gamma_1 X1 + \gamma_2 X2 + \zeta_1$$
$$Y2 = \beta_1 Y1 + \gamma_2 X1 + \gamma_2 X2 + \zeta_2$$

2. Evaluation Model

Model measurement or outer models with reflexive indicators is evaluated by convergent and discriminant validity of the indicators and composite reliability for all indicators. While the outer model with formative indicators are evaluated based on its substantive content by comparing the amount of relative weight and viewing the significance of relative weight.

Structural model or inner model is evaluated by looking at the percentage of variance explained that is R^2 for dependent latent constructs by using the measurement of Stone-Geisser Q Square test and also view the amount of structural path coefficients. The stability of these estimations are evaluated by using t-statistic test obtained through bootstrapping procedure.

a) **Outer Model (Measurement Model)**

Because of all latent variables in this study use formative indicator measurement model, which is assuming that the indicators are not correlated each other so that internal consistency reliability and validation are required. Hence, to test the validity and reliability of latent variables, the researcher only emphasizes the nimological and or criterion related validity.

b) **Inner Model (Structural Model)**

Goodness of Fit Model is measured using R-square of dependent latent with the same interpretation of regression; Q-Square predictive relevance for the structural model how good the observation value generated by the model and the parameter estimation. If the value of Q-square is > 0, it indicates that the model has predictive relevance. Otherwise, if the value of Q-Square is ≤ 0, it indicates the model lacks of predictive relevance. Q-Square calculation is performed using the formula of:

$$Q2 = 1 - (1 - R_1^2)(1 - R_2^2) \ldots (1 - R_p^2),$$

In which R_1^2, R_2^2 ... R_p^2 are the R-square of endogenous variable in the model equations.

3. Hypothesis Testing (Structural Model)

The hypothesis testing (β, γ, and λ) is done with Bootstrap resampling method developed by Geisser & Stone. Test statistic used is the t-statistic or t test. Thus, data assumption is distributed freely, does not require normal distribution assumption, and does not require large number of samples (recommended the minimum

sample of 30).

However, in PLS model, it is assumed that the relationship should be linear. The method used is Curve Fit with parsimony principle, which requires linearity if linear model significance is < 0.05 ($p < 0.05$) or if the entire model may be non-significant ($p > 0.05$).

4. Result and Discussion

a) Instrument Testing

The following tables presents the validity and reliability testing of research instruments for each variable. Table 1 shows that all correlation values of each indicator and the items are above 0.3. Thus, the overall indicators and question items are valid. While from Cronbach alpha values , it obtains 0.6 for all variables so that it can be concluded that the instruments of data research are valid.

Table 1. Instruments Validity and Reliability Testing

Indicator	X1		X2		X3	
1	**X1.1**	0.740	**X2.1**	0.725	**X3.1**	0.751
2	**X1.2**	0.662	**X2.2**	0.850	**X3.2**	0.829
3	**X1.3**	0.676	**X2.3**	0.712	**X3.3**	0.817
4	**X1.4**	0.742	**X2.4**	0.779		
5	**X1.5**	0.724	**X2.5**	0.797		
6						
Cronbach Alfa	0.751		0.830		0.834	
Indicator	**Y1**		**Y2**			
1	**Y1.1**	0.839	**Y2.1**	0.824		
2	**Y1.2**	0.430	**Y2.2**	0.791		
3	**Y1.3**	0.824	**Y2.3**	0.793		
4	**Y1.4**	0.828				
Cronbach Alfa	0.716		0.698			

Table 1 above shows that the correlation values for all items are greater than 0.3 so that it can be concluded that all research instruments are valid. Reliability test is indicated by Cronbach alpha values. The results show that Cronbach alpha values for all variables are greater than 0.6 indicating that all research instruments are reliable. Because the research instruments are proven to be valid and reliable, therefore further analysis can be conducted.

b) Testing Goodness of Fit Model

Goodness of Fit testing of structural model on inner model by using predictive-relevance value (Q^2). R^2 values of each endogenous variable in this study are as follow:

1) for Y1 variable, R^2 is obtained for 0.274,

2) for Y2 variable, R^2 is obtained for 0.561

Predictive value-relevance is obtained by the formula:

$Q^2 = 1 - (1 - R_1^2) (1 - R_2^2) \ldots (1 - R_p^2)$

$Q^2 = 1 - (1- 0.677) (1- 0.407)$

$Q^2 = 0.8084$

Calculation results show predictive-relevance value of 0.8084 or 80.84%. Predictive-relevance value of 80.84% also indicates that the diversity of data can be explained by the model for 80.84%, or in other words, the model can explain as many as 80.84% the information contained in the data. Furthermore, the remaining 19.16% information is explained by other variables (which is not contained in the model) and error. From the above phenomenon worthy models are said to have predictive value relevant.

c) Linearity Assumption Testing

In PLS analysis, there is linearity assumption that is required to be fulfilled before the analysis conducted. The assumption requires the variables relationship should be linear. Linearity assumption uses Curve Fit that indicates the linearity should meet one of these two possibilities: (1) significant linear model (linear

model sig < 0.05) and or (2) non-significant linear model and all models that may also non-significant (linear model significance > 0.05 and other than linear model significance > 0.05). The test results in the appendix show the values of linear model are < 0.05 so that the model is said to meet up the linearity assumption defined.

d) Outer Model Testing

Loading factor values indicate the weight of each indicator as a measure of each latent variable. Indicators with the highest loading factor indicates that those indicators are as the strongest or the most dominant variable measurements. The results are presented in the following table:

Table 2. Outer Loading Values of Each Variable

Indicator	X1		X2		X3	
1	**X1.1**	0.378*	**X2.1**	0.158^{ns}	**X3.1**	0.275*
2	**X1.2**	0.428*	**X2.2**	0.101^{ns}	**X3.2**	0.441*
3	**X1.3**	0.376*	**X2.3**	0.179*	**X3.3**	0.482*
4	**X1.4**	0.299*	**X2.4**	0.611*		
5	**X1.5**	0.462*	**X2.5**	0.171*		
6						
Indicator	**Y1**		**Y2**			
1	**Y1.1**	0.500*	**Y2.1**	0.296*		
2	**Y1.2**	0.048^{ns}	**Y2.2**	0.481*		
3	**Y1.3**	0.218*	**Y2.3**	0.459*		
4	**Y1.4**	0.376*				

Description: *) indicates significant weight and ns states non significant weight (p-value < 0.05)

Based on the table above it can be seen that

1. The Improvement of Human Resources Quality variable (X1) is measured by five indicators, which are Job Training (X1.1), Counseling (X1.2), Apprenticeship (X1.3), Mentoring (X1.4) and Exclusive Training (X1.5). From the highest outer weight, it is obtained that Mentoring (X1.4) is the most dominant in constructing variable X1.
2. The Availability of Fishing Gears variable (X2) is measured by four indicators which are Fishing Gear Type (X2.1), Fishing Gear Capacity (X2.2), Working Capital (X2.3), Investment Credit (X2.4) and Grant (X2.5). From the highest outer weight, it is obtained that Investment Credit (X2.4) is the most dominant in constructing variable X2.
3. The Local Cultures variable (X3) is measured by three indicators, which are Mutual Assistance (X3.1), Ritual Ceremony (X3.2) and Siri' Napacce (X3.3). From the highest outer weight, it is obtained that Siri' Napacce (X3.3) is the most dominant in constructing variable X3.
4. The Economic Capability variable (Y1) is measured by four indicators which are Saving (Y1.1), Revenue (Y1.2), Education (Y1.3) and Network (Y1.4). From the highest outer weight, it is obtained that Saving (Y1.1) is the most dominant in constructing variable Y1.
5. The Reduction of Poor Families variable (Y2) is measured by three indicators which are Economic Condition (Y2.1), Family Health (Y2.2) and Education/ Religious Level in Family (Y2.3). From the highest outer weight, it is obtained that Family Health (Y2.2) is the most dominant in constructing variable Y2.

e) Partial Least Square (PLS)

f) Direct Effect Testing

Inner model testing (structural model) essentially is to test the hypotheses in this study. Hypothesis testing is done by t-test (T-statistic) for each direct effect partially. The complete analysis results in PLS analysis results can be found in the Appendix. The following table presents the results of hypothesis testing of direct effects:

Table 3. PLS of Direct Effect Testing

Variables Correlation	Coeffi-cient	T-Statistic	P-value	Conclusion
The Improvement of Human Resources Quality (X1) on Economic Capability (Y1)	0.344	5.793	0.000	Significant
The Availability of Fishing Gears (X2) on Economic Capability (Y1)	0.418	6.371	0.000	Significant
Local Cultures (X4) on Economic Capability (Y1)	0.425	7.068	0.000	Significant
Economic Capability (Y1) on the Reduction of Poor Families (Y2)	0.638	12.827	0.000	Significant

According to the table and figure above, the results of hypothesis testing direct influence in the inner model are as follows:1.Direct effect testing of the Improvement of Human Resources Quality (X1) on Economic Capability (Y1) gives the inner weight coefficient of 0.344 with T-statistic value of 5.793, and p-value of 0.000. Since T-statistic value is > 1.96, and p-value is <0.05 so there is a significant direct effect of the Improvement of Human Resources Quality (X1) on Economic Capability (Y1). 2.Direct effect testing of the Availability of Fishing Gears (X2) on Economic Capability (Y1) gives the inner weight coefficient of 0.418 with T-statistic value of 6.371, and p-value of 0.000. Since T-statistic value is > 1.96, and p-value is < 0.05 so there is a significant direct effect of the Availability of Fishing Gears (X2) on Economic Capability (Y1). 3. Direct effect testing of the Local Cultures (X3) on Economic Capability (Y1) gives the inner weight coefficient of 0.425 with T-statistic value of 7.068, and p-value of 0.000. Since T-statistic value is > 1.96, and p-value is < 0.05 so there is a significant direct effect of Local Culture (X3) on Economic Capability (Y1).Direct effect testing of Economic Capability (Y1) on the Reduction of Poor Families (Y2) gives the inner weight coefficient of 0.638 with T-statistic value of 12.827, and p-value of 0.000. Since T-statistic value is > 1.96, and p-value is < 0.05 so there is a significant direct effect of Economic Capability (Y1) on the Reduction of Poor Families (Y2).

The following table presents the results of hypothesis testing indirect effect.

Table 4. PLS. Model of Indirect Effect Testing

Variables Correlation			Indirect Effect Coefficient	Conclusion
Independent	Dependent	Moderating		
X1	Y2	Y1	0.219	Significant
X2	Y2	Y1	0.267	Significant
X3	Y2	Y1	0.271	Significant

Based on the table above, there are six indirect effect with the following results:

1. Indirect effect testing of the Improvement of Human Resources Quality (X1) on the Reduction of Poor Families (Y2) through Economic Capability (Y1) gives indirect effect coefficient of 0.219. Since the direct effect that constructs indirect effect are both significant, it can be concluded that there is significant indirect effect of the improvement of human resources quality on the reduction of poor families through economic capability.
2. Indirect effect testing of the Availability of Fishing Gears (X2) on the Reduction of Poor Families (Y2) through Economic Capability (Y1) gives indirect effect coefficient of 0.267. Since the direct effect that constructs indirect effect are both significant, it can be concluded that there is significant indirect effect of the availability of fishing gears on the reduction of poor families through

economic ability.

3. Indirect effect testing of Local Culture (X3) on the Reduction of Poor Families (Y2) through Economic Capability (Y1) gives indirect effect coefficient of 0.271. Since the direct effect that constructs indirect effect are both significant, it can be concluded that there is significant indirect effect of local culture on the reduction of poor families through economic ability.

5.Conclusion

Based on results above, some conclusions can be obtained as follow:

1. Found that the quality of human resources to the economic capacity, the coefisien inpositive, indicating the higher the increase in human resources willlend to the higher economic capacity. Fenomena quantitativaly very important region of the coastal city of makassar, is the streng of the quality of human resources pruductivity can be increased. Implemantation of variable human resources, fishing gear involmant in economic activity, seashell, as well as the ability of economic, poverty allevation except variables proved significant involment in economic activity.
2. Perception of poverty sosioeconomic say that a good education throught training is one of the strategi used to allviate poverty. Coastal city of makassar isgrowing by the presece of the traning undertaken by the goverment even if only once a year, this causing mindset can change between involvement in economic activity on the abof low, income, high and low value means involovment in economic activity does not effect the value of the high and low economic capacity means is agrees whith teory " Siri'Na Pacce" that reski come from good, but reski is must be sought, this means that only hard work triying to improve productivity. Of local cultur on the ability of the economic indicates the higher economic capacity and whit increasing public produktivitas between economic ability to alleviate poverty.The coefisien is positif indicating that the higher the ability of the economic will result in graeter variability in come or consuption is feasi

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