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Correlation Analysis Between Production Level, National Income, Investment, Unemployment and Poverty in Indonesia

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Abstract--Economy development in Indonesia is quite prospective, especially on four variables of both macro and micro economy, such as production level, national income, investment since 2004 until 2018 can be categorized experiencing rapid growth and the level of unemployment and poverty is getting lower. However, collectively, coefficient correlation $r = 0,961$ demonstrates that the influence of rice, corn and soybeans production level are very strong on national income level and coefficient determination $R^2 = 0,924$ or 92,4 % demonstrates that the amount of contribution of influence on rice, corn, and soybeans production level collectively in 92,4% upon national income level, while it gives negative influence on unemployment level which means that more increase in national income level 2,765, it makes lower unemployment level, while investment level is still give positive influence on unemployment level which means unable to influence the level of decrease upon unemployment, however, collectively, the value of coefficient correlation $r = 0,940$ demonstrate that the influence of national income and investment level are collectively very strong and coefficient determination is $R^2 = 8,884$ or 88,4 % which means the contribution of influence on national income and investment level are collectively in 88,4% and level of unemployment gives positive influence on poverty level that means more increase in unemployment also more increase in poverty that is if unemployment increase one score, poverty is also increase in 2,717 on Constanta 83266, while coefficient correlation $r = 0,949$ meaning the influence of unemployment level is very strong on poverty and determination in $R^2 = 0,901$ or 90,1 % demonstrate that the amount of contribution of the influence on unemployment level in 90,1%.

³**Key Words**--Production Level, National Income, Investment, Unemployment and Poverty.

I. INTRODUCTION

Trading development on three main staples such as rice, corn and soybean in Indonesia is quite prospective, however it still experience frequent shortage or unable to fulfill domestic needs and also unable to export based on people and government's expectation, on contrary, sometimes importing goods in order to comply domestic needs even though Indonesia is known throughout the world as a fertile and rich country in natural resources. The growth of development, especially in Indonesia's economy from old to new order until now is quite prospective compare to other countries in the world. However, current problems in Indonesia such as production level is unable to meet domestic needs so that makes high levels in import, unemployment and also poverty in Indonesia from 2004 until 2018 is relatively decreased, still in high level. Therefore, assessment and improvement are extremely needed to

focus on economy development to reduce and eliminate problems. Data of unemployment and poverty in Indonesia for the last 4 years from 2015 to 2018 shown decrease in amount. The decrease in poverty and unemployment level can be seen on the following table:

Table 1 Poverty and Unemployment Rate in Indonesia from 2015 to 2018

Years	Percentage (%)	
	Unemployment Rate	Poverty Rate
2015	6.18	11.13
2016	5.61	10.64
2017	5.50	10.12
2018	5.13	9.84

Source: Ministry of Finance 2018, Data of Central Statistic Bureau.

The decreased of unemployment and poverty level is occurred, however, still high and need a reduction strategy on variables of both macro and micro economy that reduces level of poverty and unemployment such as production enhancement, national income, improvement in investment and so forth. The increase in national income is influencing investment growth which gives considerable impact on the growth of employment opportunity and opening chances to get jobs that able to influence the decrease in poverty and unemployment level. Therefore, researcher is interested to investigate the correlation between variables of production, national income, investment, unemployment and poverty level in Indonesia. Investment in Indonesia offers high development potency because Indonesia is very rich with natural and human resource. However, human resource in Indonesia needs to be improved on its quality whether the competency and also the quality of character. In addition, Indonesia's natural resource urgently needs collective spirits to preserve and control its availability by individuals, society, corporations and also government in order to develop better economy in the future so that the level of poverty and unemployment can be reduced and also eliminated for good so that there will be no poverty and unemployment in Indonesia. Currently, the poverty and unemployment level in Indonesia is significantly decreased; however, compare to other countries in the world, Indonesia still has high level in terms of unemployment and poverty.

II. LIBRARY STUDY

Production

In production, producers demand higher quantity and quality toward their products. Production or economy process to change production factor (input) to be production result (output) or can be defined that production is a sequence process including all activities that can add and create value from goods and service. Production utilizes resources whether natural or human to create commodity or goods. The quantity and productivity of production level can be achieved if production factors are fulfilled based on the needs. Production theory states that the relationship nature between production levels will be achieved by the amount of utilized production factors. There are two production factors; variable production and permanent production. Variable production factor is a production factor depends on output. The higher level in production, the more use of variable production factor utilized including

workforce. According to Indonesia's Science and Technology Journal, Sunartono, 2008 says that the creation of workforce is conducted by flourishing businesses through various policies such as; production, monetary, fiscal, distribution, prices and wages, export – import and the workforce itself. According to Journal (F. Wahyu), demonstrates that there is a strong correlation between gross production level and income.

National Income

The success of economy in one country is assessed by national income, national product, level of employment opportunity, price level and the position of overseas balance of payments. National income is the amount of income accepted by all family's households (FH) in a country from services of production factors owned by one country in a period usually in one year. With high income, someone able to invest stocks in a company and the money will be utilized by the company to build and develop its business and also to pay tax because it is revenue for country. In simple way, the impact of investment upon economy in one country is reflected from its national income and its investment has positive correlation with GDP. In general, it can be stated that if investment increase, GDP tends to increase too, or in contrary, if investment decrease, GDP tends to decrease too.

Investment

Investment expenditures include all domestic expenses conducted by private sector to build new buildings, new machines with its spare parts and the alteration of amount of various supplies in company. The quality of investment in the future must always in first priority. The advantage and profit from the entered investment is highly influenced by its quality in order to push the growth of real sectors that have chain reaction toward high employment absorption on various sectors such as; foods, agriculture, plantation and fishery. According to Journal from Suwarno, Agus (2009) demonstrates that there is reciprocal relationship between (I) Investment and Employment Opportunity (L) if the slow time is long.

Unemployment

Economy in one country is categorized in good condition if one of the factors that is the level of unemployment is low. Unemployment is a macro economy's problem that directly influences human and the hardest problem of all. To most of the people, losing jobs mean decrease in living standard and psychological pressure. Unemployment are the number of people classified in workforce (age 15 to 65) who don't have a job. Wahyu Aditama Putra (2018) shown that partial investment gives significant negative impact on employment, that means higher investment lowering unemployment.

Poverty

Unemployment and poverty are scourge in many countries, including super power country like the United States of America (USA). Every nation and country in the world wishes that poverty is getting lower and even permanently eliminated. Government so far always pays attention to the development program upon these two problems. The result is not yet satisfies all parties although existing social indicators demonstrate repairmen in reducing unemployment and poverty's level. Poverty is a condition or someone's inability to fulfil primary needs

such as foods, water, clothes, house, education and health. In other definition, poverty is a situation where someone is unable to meet his/her basic needs. Subsequently, there are secondary and tertiary needs such as gadgets, vehicles, sport cars, new edition of i-phone. Poverty can be caused by the scarce of tools of basic needs or no access to education and employment. According to a journal from Try Reza Putra (2017) demonstrates that open unemployment and poverty have two ways of causality relationship, seen that responds of open unemployment to poverty is negative, while respond of poverty to open unemployment is varied.

III. RESEARCH METHODOLOGY

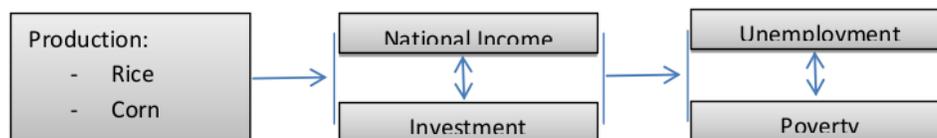
Time and Place of Research

In this research, the utilized data is data on levels of production, national income, investment, unemployment, and poverty in Indonesia. All data is placed in CSB in Jakarta, then, this research is conducted in the head office of Central Statistic Bureau Jakarta and its related agency office that is the trading and industry. The research is conducted on January 2019 until May 2019.

Population and Research Sample

This research wants to expose that by the increase levels in production, national income, and investment in Indonesia can decrease levels of unemployment and poverty in Indonesia, then it is considered that population data of whole data in Indonesia has correlation with those variables. Therefore, researcher determine research population of all data in national level related to research problems in CSB Indonesia office and in related agency. Because of researcher's limitation in time and energy, then research sample is limited to data from the last 15 years start from 2004 to 2018, data about levels of production, national income, investment, unemployment and poverty in Indonesia. **Data Analysis Method**

The framework of thought in analysis that is production level influencing national income and investment, while national income has causality relationship with investment and influencing unemployment and poverty level can be seen on the following diagram:



The framework of analysis that will be utilized is descriptive statistic able to describe general description on research and inferential statistic to test hypothesis that is distribution table of frequency in grouping, histogram graphic and polygon frequency, mean, varian, median, modus, standard deviation, workforce formula, poverty level formula, double and simple linear regressions

1. Descriptive Statistic: table of distribution and graphic

2. Simple and double **linear regression model: $Y = a_0 + a_1 x_1 + a_2 x_2 + \dots + a_n x_n + e$** , where $a_0 =$ Constanta, $a_1, a_2, \dots, a_n =$ coefficient regression and $x_1, x_2, \dots, x_n =$ independent variable, $y =$ dependent variable, $e =$ error
3. Coefficient correlation and coefficient determination
4. Counting the amount unemployment rate: $(A.WF - A.HJ) \times 100 \%$, where
 $A.WF =$ Amount of Work Force, $A.HJ =$ Amount Have Jobs
5. Poverty Line Formula : $GK = GKM + GKNM$
 $PL =$ Poverty Line
 $PLF =$ Poverty Line Food
 $PLNF =$ Poverty Line Non Food

- Percentage Formula of Poor Population:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^\alpha$$

Where: $\alpha = 0$

$z =$ poverty line

$y_i =$ average of expenses per-capita per-month of population below poverty line

$(i = 1, 2, 3, \dots, q)$, $y_i < z$

$q =$ amount of population below poverty line

$n =$ the amount of population

IV. DISCUSSION

Data of production level of rice, corn, soybeans, national income, investment, unemployment and poverty in Indonesia from 2004 until 2018 will be analyzed its correlation between those variables by utilizing simple linear and double linear regressions.

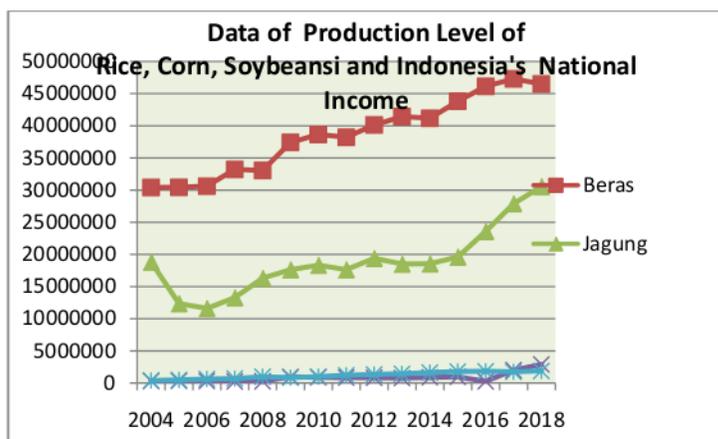
Table-1 Data of Production Level of Rice, Corn, Soybeans and Indonesia's National Income

Years	Rice (Ton)(x_1)	Corn (Ton)(x_2)	Soybeans (Ton)(x_3)	National Income (Billions Rp) (y)
2004	30410000	18840000	318929	403400
2005	30440000	12369482	335106	495200
2006	30620000	11610000	320205	638000
2007	33220000	13290000	252027	707800
2008	33060000	16320000	277281	981600
2009	37430000	17630000	974001	848800
2010	38640000	18330000	907000	995300

2011	38220000	17640000	851000	1210600
2012	40140000	19390000	843000	1338100
2013	41430000	18510000	780000	1438900
2014	41180000	18550000	892001	1635400
2015	43820000	19610000	963000	1793600
2016	46130000	23580000	274317	1822100
2017	47300000	27900000	2009160	1750300
2018	46500000	30560000	2900000	1894700

Source of data: CSB Jakarta

Data from table above can be drawn its graphic as follows:



Data from table and graphic above demonstrate that rice production from 2004 to 2018 is more increase, corn production from 2006 to 2018 is also more increasing, soybeans production from 2004 to 2018 in average growth and national income also from 2004 to 2008 is also more increase. From data analysis outcome, obtained regression equation $Y = -2129 + 0,092 X_1 - 0,012 X_2 - 0,012 X_3$, $X_1 =$ rice $X_2 =$ Corn $X_3 =$ Soybeans and $Y =$ National Income, regression demonstrate that rice production level gives positive impact on national income which means every increase one score in rice production level, also more increase in national income of 0,092 in Constanta -2129, while corn and soybean production level send negative impact on national income which means that corn and soybean production unable to influence the increase of national income, however, collectively coefficient correlation $r = 0.961$ demonstrate that the influence of rice production levels of rice, corn and soybeans collectively very strong on national income and coefficient determination $R^2 = 0,924$ or 92,4 % demonstrate that the amount of contribution of impact on production levels of rice, corn, and soybeans collectively 92,4% upon national income level because source of national income from all factors owned by a country such as level of production, tax, export, investment

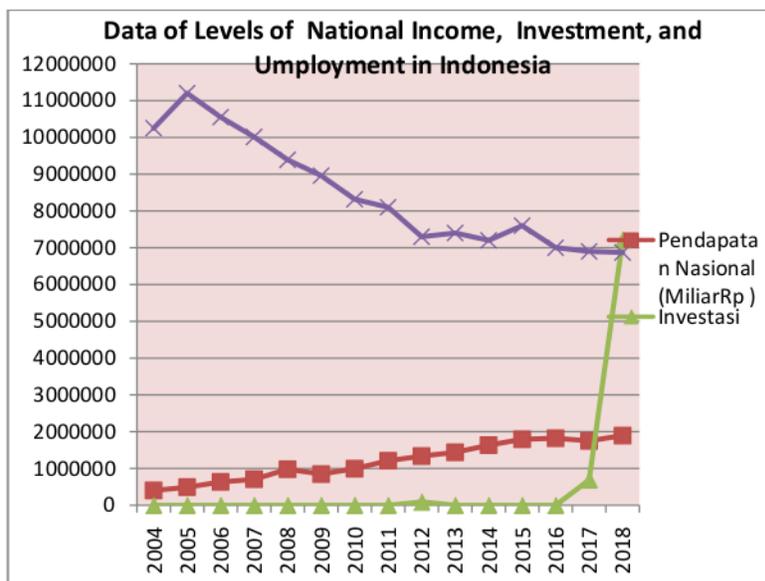
and so forth. Rice production level can increase national income because the employment of Indonesians in provinces and counties mostly are farmers. They have to do paddy farming because the main staple is rice and also it becomes basic material for home and big industries. While, corn and soybeans are season plants and only become basic material for local and giant industries.

Table 2 Data of Level of National Income, Investment and Unemployment in Indonesia

Years	National Income (Billions Rp) (x_1)	Investment (BillionsRp)(x_2)	Unemployment (people) (y)
2004	403400	37140.4	10250000
2005	495200	50577.4	11200000
2006	638000	162767.2	10550000
2007	707800	34878.7	10010000
2008	981600	20363.4	9390000
2009	848800	37799.9	8960000
2010	995300	60626.3	8320000
2011	1210600	76000.7	8100000
2012	1338100	92182,0	7300000
2013	1438900	128150.6	7400000
2014	1635400	156126.3	7200000
2015	1793600	179465.9	7600000
2016	1822100	216238.1	7000000
2017	1750300	692800	6900000
2018	1894700	7213000	6870000

Source of data: CSB Jakarta

Data from table above can be drawn its graphic as follows:



Data from table and graphic demonstrate that from 2004 to 2016 can be stated as flat and from 2016 to 2018 has very high increase, national income from 2004 to 2018 more increase, while unemployment level from 2006 to 2018 is more decrease. From analysis outcome, obtained regression equation $Y = 11754 - 2,765 X_1 + 0,038 X_2$, X_1 = National Income, X_2 = Investment and Y = Unemployment, demonstrate that national income level gives negative impact on unemployment level which means every increase in national income level 2,765 more decrease in unemployment level, while investment level still give positive impact on unemployment level which means unable to influence the decrease in unemployment level, however, collectively the value of coefficient correlation $r = 0,940$ demonstrate that the influence of levels of national income and investment collectively very strong and coefficient determination $R^2 = 8,884$ or 88,4 % which means contribution of influence on levels of national income and investment collectively 88,4%. Data given from the table shown that national income and investment are quite high compare to other counties in the world and level of unemployment is also decrease, however, the unemployment is still high caused by high fertility rate that push growth in workforce. Other factor is the big number of foreign investments that employ their own workforce influencing the displacement of local workforce become unemployment. The effect of unemployment can be classified into poverty because still lot of employees in Indonesia who received minimum wages is just enough to fulfil basic needs and have no spare to save and when they got fired or unemployment they automatically become poor.

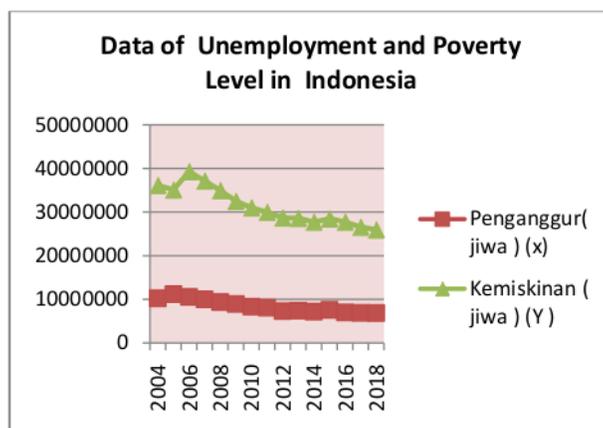
Table 3 Data of Unemployment and Poverty Level in Indonesia

Years	Unemployment (people) (x)	Poverty (people) (Y)
2004	10250000	36150000
2005	11200000	35100000

2006	10550000	39300000
2007	10010000	37170000
2008	9390000	34960000
2009	8960000	32530000
2010	8320000	31020000
2011	8100000	30010000
2012	7300000	28710000
2013	7400000	28600000
2014	7200000	27730000
2015	7600000	28510000
2016	7000000	27760000
2017	6900000	26580000
2018	6870000	25950000

Source of data: CSB Jakarta

Data from table above can be drawn it's graphic as follows:



Data taken from the above table and graphic exposed that from 2006 to 2018, the rate of unemployment and poverty is experiencing a decrease in big number. From analysis outcome, obtained regression equation $Y = 83266 + 2,717 X$, where X = unemployment, Y = poverty shown that unemployment gives positive impact on poverty level which means more increase in unemployment makes more increase in poverty that is if unemployment increases one score, poverty also increases 2,717 on Constanta 83266, while coefficient correlation $r = 0,949$ which means the impact of unemployment level is very strong on poverty level and coefficient determination $R^2 = 0,901$ or 90,1 % demonstrate that the amount of contribution on the impact of unemployment level is 90,1 or 90,1% shown that the amount of contribution on the impact of unemployment level is 90,1% on poverty level. From interview outcome toward employees who said that if they got fired or terminated from work, they automatically

categorized as the group of poor. They directly unable to fulfil basic needs because during their work, they have no spare money to save because their minimum wages are not enough to meet basic needs so that not enough money to be saved. Population data shown that there is no balance between work opportunity and workforce and it causing unemployment rate is still high and as a result also makes poverty high.

V. CONCLUSION AND SUGGESTIONS

Conclusion

From the analysis outcome of double regression shown that rice production level gives positive impact on national income which means that every increase one score in rice production level also increases in national income 0,092 on Constanta 2129, while level of corn and soybean production gives negative influence on national income level which means that com and soybean production are unable to influence the increase of national income, but collectively coefficient correlation $r = 0,961$ shown that the influence of production level of rice, corn and soybeans collectively is very strong on national income level and coefficient determination $R^2 = 0,924$ or 92,4 % shown that the amount of contribution of influence on production level of rice, corn and soybeans collectively 92,4% on national income, while national income level gives negative impact toward unemployment which means every increase in national income 2,765 makes more decrease on unemployment level, while investment level still send positive influence toward unemployment which means unable to influence the decrease of unemployment level, however, collectively the value of coefficient correlation $r = 0,940$ shown that the influence of levels of national income and investment collectively is very strong and coefficient determination $R^2 = 8,884$ or 88,4 % which means contribution of influence of levels national income and investment collectively 88,4% and unemployment level gives positive influence on poverty level which means more increase in unemployment also more increase in poverty that is if unemployment increase one score, poverty also increases 2,717 on Constanta 83266, while coefficient correlation $r = 0,949$ which means the influence of unemployment level is very strong on poverty level and coefficient determination $R^2 = 0,901$ or 90,1 % shown that the amount of contribution of influence of unemployment level is 90,1%.

Suggestions

1. Suggestion to government to minimize import on rice, and eliminate it immediately because Indonesia has massive rice field and the level of fertile land is very good and has huge potency to improve its rice production.
2. Government's policy is extremely needed because problems that commonly encountered by farmers are harvest loss because of flood or drought. Regions that hit by flood can be built canal of water disposal and region that frequently experienced harvest loss can be built dam or irrigation by the government so that the paddy production from farmers has more increase or better so that Indonesia becomes one of world's rice exporter.
3. Corn and soybean farmers can be given workshops and community in order to be continuous corn and soybean farmers' guidance annually in all over provinces or counties in Indonesia because lands in Indonesia are very compatible with corns and soybeans throughout Indonesia.
4. It is expected to people, individual, organizations and government to design strategy to decrease the levels of unemployment and poverty, for example, people have more awareness in efforts to decrease the fertility rates or

birth rates by family planning program. Government also has policy to motivate farmers by limiting import and increasing export on those three commodities and its policy to support farmers by providing fertilizers, technology, low tax, and so forth.

5. Government is encouraged to regulate infrastructure investment on areas that difficult reach by transportation during rainy seasons. There are several counties and villages in Indonesia experienced successful harvest and sometimes unsuccessful harvest that make big loss to farmers and their got broken products because they don't sale those agricultural products to the cities, especially products that can't last for long.
6. It is encouraged to create entrepreneurship trainings to produce foods from rice, corn and soybeans for both home industries and the big ones that create opportunity to export their products and creating employment opportunity that can reduce levels of unemployment and poverty in Indonesia.

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