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Socio-Economic and Property Crime Rate in Indonesia

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Abstract

This study aims to analyze the effects of socio-economic factors (inequality in income distribution, poverty, unemployment, and population) on crime rates in 31 provinces in Indonesia. The article utilizes yearly data published by the Central Bureau of Statistics (BPS-Indonesia) from 2013 to 2022. This study examines the socio-economic effects on crime rates using the two-step System Generalized Method of Moments (SYS GMM). The estimation shows that the lag in the number of property crimes positively and significantly affects property crime in Indonesia. This result indicates a dynamic relationship with the property crime rate. Moreover, poverty, unemployment, and total population positively and significantly affect short- and long-run property crime rates. However, the Gini index shows a positive correlation but lacks significance in both short- and long-term effects. These estimation results recommend that efforts be made to alleviate poverty and ensure equitable income distribution. Poverty and inequality reduction need to be pursued by all parties, especially the government, through initiatives aimed at expanding employment opportunities and sustainably empowering the community's economy.

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INTRODUCTION

Crime is a problem in modern society, where perpetrators fail to abide by the rule of law, leading to possible sentencing with fines, imprisonment, and even the death penalty. Crime significantly impacts people's lives and the environment, and many factors contribute to why someone commits a crime, including economic pressure (Halicioglu, 2010).

Economics understands crime as something that causes an inefficient distribution of resources when an individual is perceived as burdening the community by transferring responsibility for their economic interests to the surrounding community. This action identifies them as hindering the community's happiness (Becsi, 2014). The benefits of crime are assertive factors that encourage individuals to commit crimes (Jeremy Bentham, 1789).

This problem aligns with the application of demand theory to criminal behaviour. Criminals will think rationally and economically, comparing the benefits of committing a crime with the expected costs they will incur, including the risk of punishment, the possibility of social stigma, and other consequences (Becker, 1968b). This rational decision is based on maximizing utility. Crime impacts society's function and stability, and preventing crime is a significant concern in all countries due to its implications and socioeconomic costs (Carboni et al., 2013).

In the crime opportunity theory, variations in people's lifestyles or routine activities can affect opportunities for crime. Crimes occur depending on two factors: Some perpetrators are motivated and willing to engage in crime, and the environment in which the perpetrator lives increases the opportunity for crime (Cohen and Felson, 1979).

According to the Numbeo Index (2023), Indonesia's crime index in 2022 is ranked 70th on the world crime index. This position is far above other Southeast Asian countries, including Vietnam, the Philippines, Singapore, Brunei, and Thailand. Indonesia's crime index has increased from previous years. Although this increase is insignificant, Indonesia's crime index is much higher than Asia's crime index values.

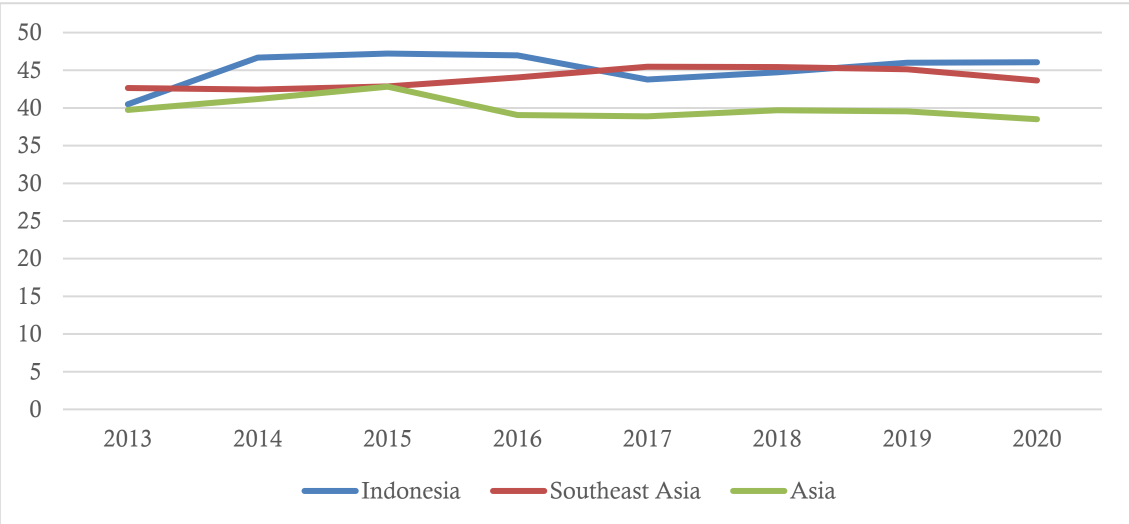

Figure 1. Indonesia, Southeast Asia, and Asia Crime Index (2013-2022)
Source: Numbeo Index, 2023 (Processed).

Based on the classification of crimes in Indonesia, the highest crimes are crimes against property rights (non-use of violence and crimes with violence). This is shown by data from the Indonesian Central Bureau of Statistics in 2013-2021, an average of 61,333 cases of crimes against property occurred per year. This is because crime against property is correlated with welfare and social problems such as unemployment, economic inequality, and population. Crime against property with violence is a crime that is classified as high in the hierarchy because apart from being related to crimes against property, it also involves physical crimes.

In its classification, crimes against property involving violence include violent looting using firearms and sharp weapons. Meanwhile, property crime without violence includes theft, theft by weighting, theft of motor vehicles, vandalism, destruction of goods, arson, and collection. Non-violent property crime is the most common classification of crime each year. Although the risk from property crime is passive, the phenomenon is highly patterned and not random, resulting in a higher risk of being exposed to property crime than to some other crime classifications.

The high number of crime incidents in Indonesia is also influenced by the effect of time or past crime incidents. A criminal who has been sentenced will return to doing the same action or actions after serving a sentence for a certain period (recidivism) (Khairani and Ariesa, 2019); Firdaus and Afif, 2021).

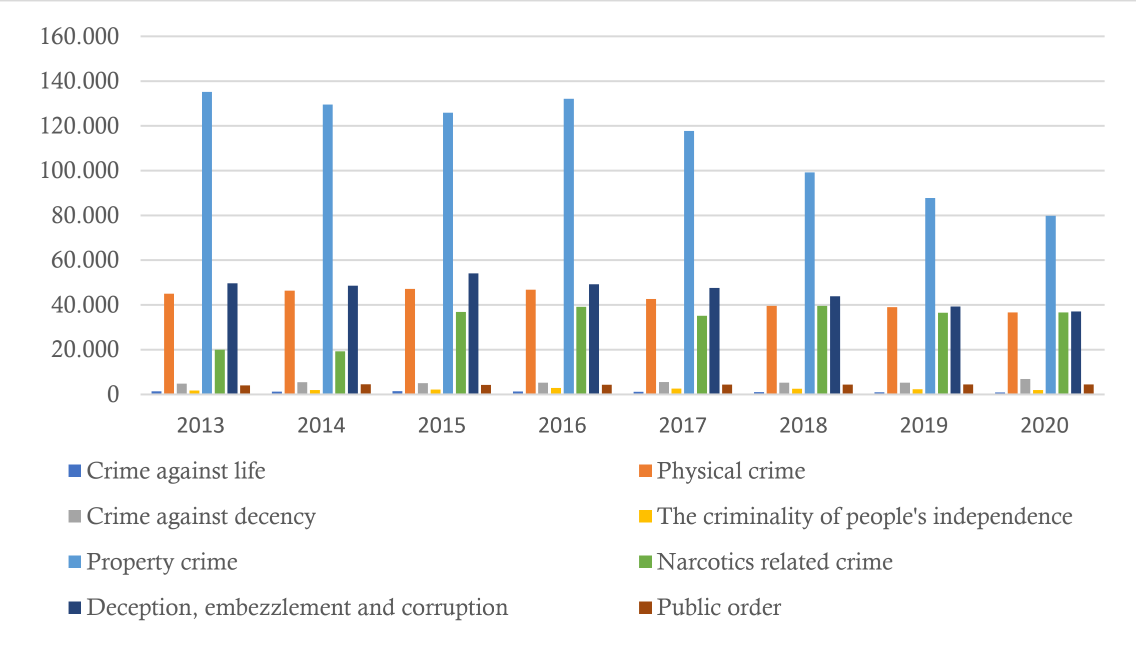

Figure 2. Number of Crime Incidents According to Crime Classification in Indonesia (2013-2020)
Source: Indonesian Crime Statistics, 2023 (Processed).

Many researchers have conducted investigations on crime, but research examining the impact of socio-economic variables on crime, especially property crime in Indonesia, is still limited. Therefore, this article aims to enhance empirical findings by measuring the impact of socio-economic problems such as income inequality, poverty, unemployment, and high population rates on property crime in 31 provinces of Indonesia.

Property crime is correlated with welfare and social problems. Property crime will increase along with problems such as inequality in income distribution, poverty, unemployment, and social structure (Bharadwaj, 2014). Every time a crime is committed, each individual can be influenced by internal and external factors (Putra et al., 2020); Rahman et al., 2018). Indonesia, which currently has a population of 272.78 million people, is projected to increase yearly in 2021 (BPS, 2022). A high population will lead to a high response rate (Putra, 2020). Where indirectly, there will be poverty and inequality among the people because people cannot finance expenses for their basic needs. Of course, this will become a serious problem when people commit illegal acts to fulfil their needs.

Distribution and crime has been widely studied. Three theories predict how income inequality will increase crime. They are Becker's economic theory of crime (1968), the theories of anomie proposed by Merton (1938) and the theories of social disorganization introduced by Porter, Porter and Cappellan (2015).

Crime will increase when there is a more significant gap between the rich and the poor, where economic considerations drive certain crimes. The activity and drive to do so are created by worsening income inequality, which hurts and harms opportunities to generate income from legal activities, indirectly increasing crime (Kelly, 2000).

Increased income inequality causes an increase in the number of robberies in some geographic regions (neighbourhoods where the rich) (Metz and Burdina, 2016). As the income gap widens, wealthy households become more attractive targets for low-income thieves. Thus, the possible profit from crime increases while the cost of crime does not change, leading to increased property crime. The difference in income between the rich and the poor can be used to measure crime rates in different areas (Ehrlich, 1996).

In addition, the theory of anomie argues that the greater the inequality felt by society, the higher the tension, which causes the tremendous encouragement of people with low status to commit crimes. In addition, the social disorganization theory explains that crime occurs when social control mechanisms are weakened. Poverty, racial heterogeneity, housing mobility, and family instability weaken a society's ability to organize its members. In this case, inequality is associated with crime because it is related to poverty. Regions with high inequality tend to have high poverty levels (Kelly, 1997 and 2000).

Gordon and Gordon (1973) argue that capitalism and inequality can cause crime. Gordon views criminal behaviour as part of the structure of capitalist society and is the impact of socio-economic conflicts resulting from that structure. As a result, crime is the result of the efforts of the poor to create a better life for themselves.

In other previous studies conducted by Stack (1984), reducing societal inequality cannot reduce crime. Hendri (2019) found that the Gini index has a positive and significant correlation with crime in 33 provinces in Indonesia from 2007-2011. However, the relationship is not linear but forms an inverted U. In a specific range, increasing income inequality will encourage crime. However, after reaching this maximum point, crime will decrease again. Metz and Burdina (2016) found that inequality in income distribution is one of the factors causing crime. Income inequality creates more significant incentives for people in poorer neighbourhoods to steal from people wealthier neighbourhoods, increasing property crime.

People will commit crimes only if the costs exceed the benefits obtained. So that people who live in poverty have far greater opportunities to commit crimes (Sharkey, Besbris and Friedson, 2018). Crime is a way for the poor to obtain economic goods which cannot be obtained legally. For those living in poverty, the goods they get from crime are more valuable than the risk they will accept. Nilsson and Estrada (2005), using panel data from 1973-2000, found that the relative number of poor people strongly influenced both the overall crime rate and the crime rate against property in Sweden. Larsson and Larsson (2007) found that the poor are more vulnerable to property crimes related to vehicles than other property crimes. Papaioannou (2017) used panel data from 1910-1939 and explained that the expansion of poverty was the leading underlying cause of crimes against property in British colonial areas in Asia.

The microeconomic model of crime predicts that an increase in the unemployment rate will reduce the opportunity cost of crime, increasing crime (Becker, 1968a); (Ehrlich, 1996); (Freeman, 1999). Empirical evidence on the relationship between unemployment and criminal activity has been the subject of many studies. Criminologists draw on rational choice theory, assuming individuals know the costs and benefits of criminal activity in their immediate environment. Potential criminals consider the information in deciding whether to engage in or refrain from illegal activity. Consequently, when the profits anticipated by criminals exceed the opportunity costs, the aggregate crime rate will increase ((Becker, 1968b). Unemployment increases the property crime rate because crime becomes more attractive than other means of obtaining monetary income (Mcshane M william III, 2003).

Long-term unemployment or those who are unemployed for more than 15 weeks will be the reason for increased crime rates against property in the United States (Chamlin and Cochran, 2004). Unemployment positively and significantly affects property crime (burglary, car theft, and bicycle theft) in Sweden (Edmark, 2005). According to Chang (2012), developing and developed countries have unemployment problems because unemployment is unavoidable. The government needs to overcome unemployment because it has the potential to cause other problems, such as crime and poverty.

Recher (2019) shows that unemployment does not affect property crime in aggregate in Croatia. Research conducted by Armin (2020) involving 31 provinces in Indonesia in 2013-2017 shows that the unemployment variable has a negative and insignificant effect on crime in Indonesia. Anser et al. (2020) found that unemployment has a direct and significant relationship with crime. Elzati and Adnan (2020) show that poverty and unemployment are the two main categories which have a significant relationship with crime rates in all regions in Riau Province in 2018.

The relationship between population size and the crime rate is explained by Wirth (1938) in their theory known as urbanism or social control. He argues that areas with large populations will lose social bonds when living among foreigners. The effect can be to cause an increase in the crime rate as the population size of an area increases. There is a measure or causal process explaining the population size or population that encourages crime. First, the social control perspective emphasizes that population growth weakens social control mechanisms, leading to more crime. This happens because when an area has a large population, the area will be free from individual tendencies and begin to limit the quality of social interaction. Therefore, bonds of solidarity that were once produced no longer inhibit social deviance or crime (Bennetf, 1991). The second is a structuralist perspective centred on the causal impact of population size on the quantity of social contact. When the total population increases, crime will double Interaction (Mayhew and Levinger (1976).

Research by Chamlin & Cochran (2004) also states that population size significantly influences the number of violent and property crimes. Population size is the best predictor of violent and property crime rates. The number of people living in poverty can indirectly cause high crime. Poverty is a driving factor for crime. Someone will be willing to do various ways to meet their basic needs, including criminal acts. Paylor and Smith (2010) identified that the main factors that can cause poverty are unemployment, overpopulation, unequal distribution of resources in the global economy, lack of education, and low employment opportunities. The high unemployment rate will affect the crime rate indirectly because, with an increasing population, it will be more difficult for people to find work. Without a job and the means to obtain their daily bread, people resort to alternative solutions that are not always legal .

A high population in an area can be associated with a high crime rate (Putra et al., 2020). Cities with higher populations have higher crime rates than cities with lower populations (Iii, 2004); (Chamlin and Cochran, 2004). The variable population size best predicts violent and property crime rates. The total population significantly affects crime rates in Indonesia (Putra et al., 2020); other previous studies conducted by Elzati and Adnan (2020) found that increased crime rates were affected by population declines. After statistical tests, most areas with high population levels do not significantly impact the crime rate.

However, this research attempts to investigate this issue and chooses Indonesia as a case study because this country is one of the countries with the highest population in the world.

RESEARCH METHODS

This study uses panel data for provincial-level research in Indonesia (31 provinces) from 2013 to 2020. The analysis technique in this study uses quantitative analysis using the Generalized Method of Moment (GMM) method. The GMM model has two estimators: the Arellano-Bond estimator (GMM differences) and the Arellano-Bover/Blundell-Bond estimator (GMM system). In contrast, the FD GMM and SYS GMM estimators have two models: the one- and two-step models. Estimation using two-step is more efficient for heterogeneity and autocorrelation (Roodman, 2009).

Dynamic panel data has two characteristics. First, it possesses a dynamic structure where the equation model includes at least one lag of the dependent variable on the right side. Second, it exhibits a panel structure where the data has cross-section and time series dimensions. The dynamic panel data model describes the correlation between economic variables, many of which are dynamic. Economic variables are influenced not only by contemporaneous variables but also by variables from previous periods. In general, the dynamic panel data model can be written as follows (Baltagi, 2005):

$$y_{it} = \delta y_{i,t-1} + x'_{it}\beta + u_{it} \quad \text{.......................(1)}$$

where, δ = scalar, x'_{it} = The matrix is of size 1 x K, β = The matrix is of size K x 1, u_{it} = Error term. In this case, u_{it} assumes a one-way component error model, which can be written as follows:

$$u_{it} = \mu_i + \nu_{it} \quad \text{...(2)}$$

where, μ_i = Is an individual effect that is assumed to be $\mu_i \sim IID(0, \sigma_\mu^2), \nu_i$ = Is the error term that assumes $\nu_{it} \sim IID(0, \sigma_\nu^2)$.

In the dynamic panel regression model equation (1), the coefficient β is the short-term effect of changes in x_{it}. Where β is also known as the short run multiplier short-run multiplier. Meanwhile $(\frac{\beta}{1-\delta})$ is the long-term effect of changes in x_{it} or also known as the long-run multiplier (Matyas, 1999).

The panel data model that includes the dependent variable *lag* has several things that are out of sync with the classical assumptions. Among them is the existence of autocorrelation as a result of the lag variable *lag* variables $y_{i,t}$ namely $y_{i,t-1}$ between the independent variables and heterogeneity due to differences in the units of analysis. Since $y_{i,t}$ is a function of μ_i, then $y_{i,t-1}$ is also a function of μ_i. Thus, $y_{i,t-1}$ correlates with the independent variables and the *residual error term*. This will cause bias and inconsistency in the OLS estimator and other conventional estimators, even though ν_{it} is not serially correlated (Baltagi, 2005). Even when using GLS, bias conditions will still occur. Moreover, when the sample size is increased, it cannot eliminate the correlation in the estimator.

So another way to eliminate bias is to use *fixed effect* or *within-transformation* estimator. However, this estimator will encourage correlation or bias in panel data within a short time. In addition, the solution to increasing the number of samples will also not be able to eliminate the correlation. As a result, the fixed effect estimator remains inconsistent**.** So a consistent estimator should be between the OLS estimator and the fixed effect.

To overcome the inconsistency problem in the model, Anderson (1982) proposes using the Instrumental Variable (IV) estimation method by instrumenting variables correlated with errors. First difference can eliminate heterogeneity by eliminating individual effects (μ_i) and replacing it with $\Delta Y_{i,t-2} = (Y_{i,t-2} - Y_{i,t-3})$ or with $Y_{i,t-2}$ as the instrument for $\Delta Y_{i,t-1} = (Y_{i,t-1} - Y_{i,t-2})$. Where this instrument will not be related to $\Delta\nu_{it} = (\nu_{i,t} - \nu_{i,t-1})$, as long as ν_{it} are not correlated with each other serially. So that in the T-period, there are $(Y_{i,1}, Y_{i,2}, \ldots, Y_{i,T-2})$ a set of instrumental variables. This makes the number of instrument variables contained in the instrument variable matrix as much as $\frac{(T-2)(T-1)}{2}$.

However, this method only produces consistent but inefficient parameter estimates because the *Instrumental Variable* model does not take advantage of available moment conditions and still leaves problems related to the correlation between independent variables and the difference from the predicted value (Δv_{it}).

Arellano and Bond (2013) suggested the Generalized Method of Moment (GMM) as a more efficient approach than Anderson (1982) assessment. The GMM method can overcome violations of assumptions on data such as autocorrelation and heterogeneity and is one method that can control endogeneity because of the ease in determining appropriate instrument variables to deal with endogeneity problems. Although the Arellano-Bond GMM estimator has been efficient, (Blundell and Bond, 1998) suggest using the GMM System or the Blundel-Bond GMM estimator which are claimed to be more efficient than the previous estimator. This is due to the use of additional level information, namely the moment conditions and the level instrument matrix variables in addition to the First difference by combining the moment conditions and the instrument variable matrices. So in estimating, there are two estimates used, namely; First-Difference GMM and System GMM.

So that when the research variable is entered into the equation, it will be as follows:

$$(CR)_{i,t} = \alpha + \beta_0(CR)_{i,t-1} + \beta_1(GNR)_{i,t} + \beta_2(PRO)_{i,t} + \beta_3(UNE)_{i,t} + \beta_4(PG)_{i,t} + u_{it} \quad \text{......} (3)$$

Table 1. Definitions of variables

Variable	Definition
Property Crime	Number of criminal cases against property rights
Lag of Property Crime	The Logarithm of the number of criminal cases against property in the previous period
Income Inequality	Income inequality distribution ratio.
Poverty	Percentage of the population living below the poverty line
Unemployment Rate	Comparison of the number of unemployed and the number of the labour force, which is calculated in per cent
Population	The total number of Indonesian residents who have lived in Indonesian territory for approximately six months

Source: BPS – Statistics Indonesia, 2023

RESULTS AND DISCUSSION

Before entering the results and discussion, a flowchart will be shown to clarify using the Generalized Method of Moment (GMM) method.

Gurajati (2012) explains that in analyzing panel data, the classic assumption test is not always needed because panel data can minimize bias likely to appear in the analysis.

To determine the validity of instrument variables whose number exceeds the number of parameters estimated in model (overidentifying restrictions conditions), a Sargan test can be performed. The null hypothesis (H0: z = 0) is the discovery of valid overidentifying restrictions in the model.

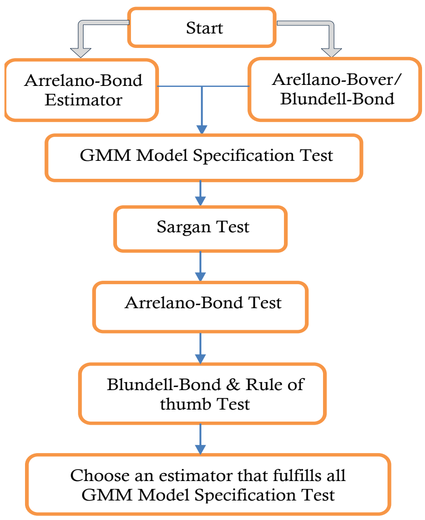

Figure 3. Generalized Method of Moment (GMM) Model
Source: Gujarati, 2012

Decision-making uses a significance level of 5 per cent or a probability value 0.05. If the test finds a probability value above 0.05, H0 fails to reject. However, Ha fails to reject if the test finds a probability value below 0.05. With the following hypothesis testing: H0: The condition of overidentifying restriction in model estimation is valid; Ha: The condition of overidentifying restriction in model estimation is not valid.

The Arellano bond autocorrelation test was carried out to test the consistency of the estimation obtained from the GMM process. The Arellano-Bond null hypothesis is that there is no autocorrelation in estimation model. Decision making uses a significance level of 5 per cent or a probability value 0.05. If the test finds a probability value above 0.05, H0 fails to reject. However, Ha fails to reject if the test finds a probability value below 0.05. With the test hypothesis: H0: There is no autocorrelation in the estimation model; Ha: There is autocorrelation in the estimation model.

In determining consistency, a consistent model is indicated by the p-value of the autocorrelation test (m1) being significant and the p-value of the autocorrelation test (m2) not being significant. Several rules must be observed in this model:

$$Y_{it} = \beta_0 Y_{it-1} + \beta_1 X'_{it} + \varepsilon_{it} \quad \text{.........................(4)}$$

If the dependent variable in the equation as above is persistent and approximates a random walk (that is, β_0 ≥ 1) applying the GMM difference estimator results in a biased and inefficient estimate of β_0 in the finite sample, and this is especially dangerous when T is short. Bundell and Bond (1998) attribute the poor performance of the difference GMM estimator in this case to the use of poor instruments. To overcome this, the system GMM is used.

The autoregressive model must be estimated using the pooled least square approach and fixed effects. The pooled least square estimate for β_0 should be considered an upper-bound estimate, while the fixed effect estimate should be considered a lower-bound estimate. Suppose the Difference GMM estimate obtained is close to or below the Fixed Effect estimate. In that case, the previous estimate is biased downwards due to weak instruments, and the system GMM estimator is more likely to be used.

In detecting the weakness of the instrument variables used, it can be seen by looking at the results achieved by the autoregressive coefficient through the GMM estimator with alternative estimators (pooled least squares and fixed effects). This shows that the value of a consistent or unbiased estimator is between PLS and FE.

Table 2. GMM Specification Test Results on One-Step FD GMM

AR Test	**Z**	**Prob > z**
AR1 (m1)	-2.1408	0.0323
AR2 (m2)	-1.4227	0.1548
Sargan Test	Chi2 95.73723	Prob > Chi2 0.0000
Parameter (Lag CR)	Coefficient	p-value
One-Step FD GMM	0. 2972736	0.004
pooled least square	0.8254467	0.000
Fixed effect.	0.5932586	0.000

Source: Data Processed, 2023

Based on the specification test rules of the GMM estimation model, a specification test is carried out on the First Difference GMM estimation model. Where three essential rules must be met to choose a GMM model, from the statistical test results in Table 2, the results of the Sargan test on One-Step FD GMM show a probability value of 0.0000 so that H0 is rejected, meaning that the instrument used is not valid. Thus, the One-step FD GMM estimation model fails the first specification test, the Sargan test.

Furthermore, the consistency test with the Arellano-Bond Test shows a probability value of m1 of 0.0323, so it rejects H0, which is significant at the 5 per cent significance level. The probability value of the m2 test is 0.1548 fails to reject H0, which is not significant at the 5 per cent significance level, meaning that there is no autocorrelation in the estimation model. As a result, the One-step FD GMM satisfies the second specification test.

In addition, to determine if there is bias in the estimation model, the results of the One-step FD GMM estimation model are compared with those of other estimators. The estimator lag (CR) value for the One-Step FD GMM is 0. 2972736, the pooled least square estimator value is 0.8254467, and the estimator lag (CR) value for the fixed effect is 0.5932586. It can be said that the value of the One-Step FD GMM estimator is below the value of the fixed effect estimator, so it is downward biased. As a result, the One-step FD GMM estimator could not be used in this study because it did not meet the three requirements of the GMM model specification test.

Table 3. GMM Specification Test Results on Two-Step FD GMM

AR Test	**Z**	**Prob > z**
AR1 (m1)	-3.0202	0.0025
AR2 (m2)	-1.3658	0.1720
Sargan Test	Chi2	Prob > Chi2
	26.40818	0.8517
Parameter (Lag CR)	Coefficient	p-value
Two-Step FD GMM	0.3048467	0.000
pooled least square	0.8254467	0.000
Fixed effect.	0.5932586	0.000

Source: Data Processed, 2023

From the statistical test results in Table 3, the results of the Sargan test on Two-step FD GMM show a probability value of 0.8517, so it fails to reject H0, meaning that the instrument used is valid. In this way, the Two-step FD GMM estimation model meets the first specification test, the Sargan test. Furthermore, the consistency test with the Arellano-Bond Test shows a probability value of m1 is 0.0025, so it rejects H0, which is significant at the 5 per cent significance level. The probability value of the m2 test is 0.1720, so the failure to reject H0 is insignificant at the 5 per cent significance level, meaning there is no autocorrelation in the estimation model. As a result, the Two-step FD GMM satisfies the second specification test. In addition, to determine if there is bias in the estimation model, the results of the Two-step FD GMM estimation model are compared with those of other estimators. The estimator lag (CR) value for the Two-step FD GMM is 0.3048467, the pooled least square estimator value is 0.8254467, and the estimator lag (CR) value for the fixed effect is 0.5932586. It may be stated that the value of the Two-Step FD GMM estimator is below the value of the fixed effect estimator, indicating a downward bias. Consequently, the Two-step FD GMM estimator could not be used in this study as it did not meet the three GMM model specification test requirements.

Table 4. GMM Specification Test Results on One-Step SYS GMM

AR Test	**Z**	**Prob > z**
AR1 (m1)	-3.7509	0.0002
AR2 (m2)	-1.3476	0.1778
Sargan Test	Chi2	Prob > Chi2
	140.8061	0.0000
Parameter (Lag CR)	Coefficient	p-value
One-Step SYS GMM	0.6600504	0.000
pooled least square	0.8254467	0.000
Fixed effect.	0.5932586	0.000

Source: Data Processed, 2023

Based on the specification test rules of the GMM estimation model, a specification test is carried out on the System GMM estimation model. Where three essential rules must be met to choose a GMM model, from the statistical test results in Table 4, the results of the Sargan test on one-step SYS GMM show a probability value of 0.0000, so H0 is rejected, meaning that the instrument used is invalid. Thus, the One-step SYS GMM estimation model fails the first specification test, the Sargan test. Furthermore, the consistency is tested with the Arellano-Bond Test. In the One-Step SYS GMM, it is known that the probability value of m1 is 0.0002, so it rejects H0, which is significant at the 5 per cent significance level. The probability value of the m2 test is 0.1778, so the failure to reject H0 is insignificant at the 5 per cent significance level, meaning there is no autocorrelation in the estimation model. Subsequent tests were carried out to see whether the instrument used was biased by comparing the results of the One-Step SYS GMM parameters with the results of the pooled least squares parameter and the fixed effect. The estimator lag (CR) value for the One-Step SYS GMM is 0.6600504, the Pooled Least Square estimator value is 0.8254467, and the estimator lag (CR) value for the Fixed Effect is 0.5932586. It can be stated that the One-Step SYS GMM estimator value is between the pooled least square and fixed effect estimator values. However, as a result, in this study, the One-step SYS GMM estimator could not be used because it did not meet the three requirements of the GMM model specification test.

Table 5. GMM Specification Test Results on Two-Step SYS GMM

AR Test	**Z**	**Prob > z**
AR1 (m1)	-3.3083	0.0009
AR2 (m2)	-1.3709	0.1704
Sargan Test	Chi^2	Prob > Chi^2
	26.72317	0.9755
Parameter (Lag CR)	Coefficient	p-value
Two-Step SYS GMM	0.654021	0.000
Pooled least square	0.8254467	0.000
Fixed effect.	0.5932586	0.000

Source: Data Processed, 2023

From the statistical test results in Table 5, Sargan test results on Two-step SYS GMM show a probability value of 0.9755, so it fails to reject H0, meaning that the instrument used is valid. In this way, the Two-step SYS GMM estimation model meets the first specification test, the Sargan test. Furthermore, the consistency is tested with the Arellano-Bond Test. It is known that the probability value of m1 is 0.0009, so it rejects H0, which is significant at the 5 per cent significance level.

The probability value of the m2 test is 0.1704, so the failure to reject H0 is insignificant at the 5 per cent significance level, meaning there is no autocorrelation in the estimation model. As a result, the Two-step SYS GMM satisfies the second specification test. In addition, to determine if there is bias in the estimation model, the results of the Two-step SYS GMM estimation model are compared with those of other estimators. The estimator lag (CR) value for the Two-step SYS GMM is 0.654021, the pooled least square estimator value is 0.8254467, and the estimator lag (CR) value for the fixed effect is 0.5932586. It can be said that the value of the Two-Step SYS GMM estimator is consistent and unbiased because it is between the value of the pooled least square estimator and the fixed effect. Therefore, the Two-step SYS GMM estimator is appropriate to be used as an estimator in research because it fulfils all the criteria for determining the best estimator.

Research estimation testing was carried out by using the Two-Step SYS GMM approach. In addition to this model to meet the best model criteria, the Two-Step model is more efficient and has a robust standard error for heterogeneity and autocorrelation compared to One-Step

(Roodman, 2009). The results of the analysis of short-term (short run) and long-term (long run) effects using the Two-Step SYS GMM model can be described in the following Table of estimation results:

Table 6. Model estimation results using the Two-Step SYS GMM Approach

CR	Short Run Effect		Long Run Effect	
	Coef.	**Pr(>|z|)**	**Coef.**	**Pr(>|z|)**
CR | L1.	0.65402101***	0.000	-	-
GNR	0.00160406***	0.000	0.0979451	0.388
PRO	0.04318067***	0.000	0.1362758	0.060
UNE	-0.05579445***	0.000	-0.1913249	0.347
PG	1.5676931***	0.000	2.615981***	0.000
_cons	-12.29886***	0.000	-	-
legend: * p<.05; ** p<.01; *** p<.001				

Source: Data Processed, 2023

Based on Table 6, CR (Criminal Rate) as the dependent variable has the first lag with a p-value of 0.000, which is significant at the 5 per cent level. These results indicate that in the analysis, year (t) is still influenced by year (t-1) so that this model has a dynamic relationship with a coefficient value of 0.65402101 or every 1 per cent increase in the lag variable in the crime rate will significantly affect the crime rate by 65.40 per cent assuming other variables remain constant or ceteris paribus.

In the short run, inequality in income distribution (GNR) has a positive correlation and significantly affects the crime rate in Indonesia with a coefficient of 0.00160406 or 0.16%. Conversely, in the long run, the positive correlation has no significant impact on the crime rate in Indonesia. This explains why short-run income inequality encourages individuals to commit crimes to respond to economic needs and goods. In the short run, the activity or incentive to commit crimes due to high-income inequality is created by frustration or jealousy (Kelley, 2000).

There has been no progress on equitable income distribution in Indonesia. This is because the government's equalization efforts have not worked optimally because of the slow pace of bureaucracy. In economic restrictions, they have to meet basic needs to survive, so some poor people choose illegal and risky jobs but generate income and generate more income when compared to legal work (Armin and Idris, 2019). Meanwhile, in the long run, the suggestion to commit crimes resulting from income inequality may decrease so that the effect will no longer be significant. This could be caused by external factors not included in this study.

Poverty (PRO) has a positive correlation. It significantly affects the property crime rate in the short run, with a coefficient value of 0.04318067 or an effect of 4.32% in a state of ceteris paribus. However, in the long run, the effect of poverty on the crime rate is not significant, even though the correlation is 13.63%. Becker (1968) argues that people will commit crimes only if the costs are lower than the benefits.

Those who live below the poverty line tend to have difficulty meeting primary needs (clothing and food). They will take shortcuts, such as committing a crime, to make ends meet. Therefore, those who live in poverty have more significant opportunities to commit crimes. Because the goods they get from the proceeds of crime have a more excellent value than the risk they will receive. When the poverty rate decreases, crime against property will also decrease. This will have a good impact on the social and economic life of the community. The country's improving economy will make it easier for people to meet their daily needs and not commit crimes.

However, the variable unemployment rate (UNE) has a negative and significant relationship to Indonesia's number of property crimes in the short run. Every 1 per cent increase in the open unemployment rate will decrease the property crime rate by 5.57%. Likewise, in the long run, it was found that the unemployment rate has a negative but not significant relationship. This finding does not follow the theory explaining a positive and significant relationship between unemployment and crime. This happens because Indonesia has many socioeconomic phenomena.

The high unemployment rate is caused by several factors, including the large number of new university graduates who struggle to find suitable jobs and the large number of undergraduate graduates who are hesitant to accept jobs due to concerns about perceived inequality in their degrees and competencies. As a result, these graduates are unemployed and not working at all. This is one of the reasons why unemployment in Indonesia in this study is not following existing theories. Based on data from the Indonesian Central Statistics Agency, the number of unemployed in Indonesia is dominated by a young population with a total of 2.54 million people. This figure is equivalent to 30.12% of the total national unemployment. In addition, when viewed from the highest level of educational attainment, the number of open unemployed graduates of Diploma/Higher Education is much higher when compared to the unemployed who have never/did not finish elementary school. Data for 2022 shows that the number of unemployed D3/S1 graduates reached 1,120,128, while the unemployed who never/did not finish school were only 462,671.

People who have education and knowledge will be less likely to commit crimes. This is because they know that crime is an activity that violates and harms society economically, and they know what consequences they will receive if they commit a crime. However, increasing the unemployment rate is still not a wise step in reducing the property crime rate in Indonesia.

In the short-run effect, the population variable (PG) has a positive correlation and significantly affects the crime rate in Indonesia with a coefficient value of 1.5676931. Where every 1 per cent of population growth will affect the crime rate by 156.76 per cent, assuming other variables remain constant or ceteris paribus. Likewise, in the long run, the population has a positive correlation and significantly affects the crime rate in Indonesia. The ratio of the influence of population in the long run and short run is 1.6 or 166.86%.

This finding proves several theories explaining the relationship between population size and crime rate. Population size is the best predictor of violent and property crime rates. A high population in an area can be associated with a high crime rate (Putra et al., 2020). A higher population in an area will result in fewer jobs and later cause unemployment and income inequality between working and unemployed workers. Finally, things like this encourage someone to commit crimes. The population is one of the factors that can trigger criminal acts because areas with a large population tend to experience economic problems, welfare, food needs, and a lack of security levels which lead to criminal acts

CONCLUSION

The economic factor is strong enough to encourage someone to commit a crime. Given the significant impact of income inequality and poverty on the crime rate in Indonesia, efforts are needed to alleviate poverty and ensure equitable income distribution. Poverty and inequality reduction needs to be carried out by all parties, especially the government, by seeking to expand employment opportunities and Sustainably empower the community's economy. The government needs to maintain pro-people economic activities to drive down the poverty rate in Indonesia. Efforts to reduce inequality and poverty must also be followed by improving the access of people experiencing poverty to production factors appropriately because the success of poverty alleviation programs depends on identifying targeted groups and areas.

A country, including Indonesia, cannot be separated from residents who have settled for a certain period. Differences in population numbers and growth between regions lead to an imbalance in human resources (HR) which causes various demographic, social, and economic problems such as economic inequality, poverty, unemployment, and even crime. The government and the community are expected to work together again in activating family planning (KB) programs to control fertility and population in Indonesia, aiming to overcome various problems caused by the high population. Furthermore, to improve the quality of Indonesia's large population, improvement and equity in education, health, and community services are needed.

The crime data used for this study comprises the rates of violent and non-violent property crimes. Further research is expected to investigate several other crime classifications in Indonesia, such as fraud, embezzlement, corruption, etc. Further analysis is needed to explore the dynamic relationship between socioeconomic factors and criminality in Indonesia.

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