The Effect of Income Inequality, Unemployment, and Urbanization on Crime Index in 5 ASEAN Countries

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Abstract

This study aims to determine how the long-term and short-term effects of income inequality, unemployment, and urbanization variables on the crime index in 5 ASEAN countries. The type of research used is descriptive quantitative. Using panel data with a time period of 2012-2022. The object of research is ASEAN-5 countries which include Malaysia, Philippines, Indonesia, Thailand, and Singapore. The data analysis technique in this study uses the ARDL Panel method with testing using Eviews 12. The results show that the income inequality variable in the long term has a positive and significant effect on the crime index, while in the short term it has a positive and insignificant effect on the crime index. Unemployment variable in the long term has a positive and insignificant effect on the crime index, while in the short term it has a negative and significant effect on the crime index. Urbanization variable in the long term has a positive and significant influence on the crime index, while in the short term has a positive and insignificant influence on the crime index.

Keywords: crime index; income inequality; panel ARDL; unemployment; urbanization.

1. Introduction

Security is an important concern for human existence. Security can be jeopardized if social norms, laws, and rules are violated, thereby becoming an opportunity for crime to emerge. Based on a report from the Global Organized Crime Index in 2023, no less than 83% of the human population globally lives in countries with high countries with high crime rates compared to 2021 which is still at 79%. This proves that crime rates are rapidly evolving in response to increasing political, social, economic, and security challenges. The Global Organized Crime Index 2023 report shows that Southeast Asia is the region in Asia with the second highest crime rate after West Asia with a score of 5.82 [1]. The Association of Southeast Asian Nations (ASEAN) is a forum for countries in the Southeast Asian region to cooperate. The founders of this organization are known as ASEAN-5 which consists of Malaysia, Philippines, Indonesia, Thailand, and Singapore. As the founding countries of ASEAN, these five as the founding countries of ASEAN, these five countries are used as role models in the form of policies implemented in dealing with a problem [2]. Therefore, in this study researchers are interested in making ASEAN-5 the country to be studied.

Table 1. Crime Index of 5 ASEAN Countries in 2022 (%)

Country	Year	Rate
Malaysia	2022	55.7
Philippines	2022	42.3
Indonesia	2022	46.1
Thailand	2022	39.3
Singapore	2022	27.6

Source: Numbeo (2023)

Based on table 1 above, it is known that Malaysia is the country with the highest crime rate, while Singapore is the country with the lowest crime rate. The high crime rate is certainly influenced by several causal factors. According to Simanjuntak (1985) in the book Introduction to Human Resource Economics that crime can be caused by demographic (population-related), economic (income inequality, unemployment, and poverty), and social (family, education, politics, and religion) factors [3]. In the book Law and Criminology by Susanti & Rahardjo (2018) it is also stated that urbanization is one of the factors that cause crime [4].

A major problem in economic progress globally today is income inequality. The 2022 world inequality report shows that the richest 10% of people control 52% of all income, while the poorest group of people receive only 8.5% [5]. According to the United Nations Development Program (2013), the countries in Southeast Asia are are the only region in Asia Pacific with a widening gap and have not yet succeeded in reducing the gap. Data on income inequality in 2022 shows that the Philippines has the highest level of income inequality at 44.1%, while Indonesia has the lowest unemployment rate at 38.4% [6].

Apart from income inequality, unemployment is one of the factors that influence the crime rate. This is because unemployment is a major problem in macroeconomics. It is reported from World Bank data that the percentage level of unemployment in 2020 has increased throughout the Southeast Asian Region along with problems in the form of a health crisis caused by Covid-19 which resulted in many companies laying off workers. Unemployment data in 2022 shows that Malaysia has the highest unemployment rate of 3.63%, while Thailand has the lowest unemployment rate of 0.94% [7].

Another factor driving crime is the high rate of urbanization. Statistics from the United Nations (UN) show that the global population is expected to reach 8.3 billion by 2030 and 9.1 billion by 2050, with an estimated 4.9 billion living in cities by 2030 and 6.3 billion by 2050. For this reason, there is a significant difference between countries where most of the population lives in rural areas and countries where most of the population lives in urban areas. As a result of excessive urbanization, urban conditions have become increasingly uncontrollable, leading to the emergence of various new problems including increased crime caused by poverty, high unemployment rates, and increased slum populations. As a result, urbanization is considered as a factor that affects the physical and social growth of cities. From the 2022 urbanization population growth data, Singapore is the country with the largest urbanization growth rate at 3.31%, while Thailand is the country with the lowest urbanization growth rate at 1.52% [8]. For this reason, this research aims to determine the long-term and short-term influence of the variables income inequality, unemployment and urbanization on the crime index in 5 ASEAN countries.

2. Literature Review

2.1. The Differential Structure of Opportunity Theory

The theory developed by Richard A. Cloward and Lloyd E. Ohlin states that delinquency is an activity with the definite goal of gaining wealth through illegal means. A sub-culture of delinquency is formed when there is a gap between culturally desirable goals among lower-class adolescents and the limited opportunities to achieve these goals through legal means [9]. The types of delinquent sub-cultures develop in relation to the in relation to the different illegitimate ways of achieving goals, including goals, among others:

- Conflict sub-culture that exist in unorganized and unstable social environments.
- Criminal sub-culture, which is found in social environments characterized by mostly low-income citizens and high crime rates.

2.2. Critical Criminology Theory

This theory was proposed by David M. Gordon. He stated that crime is a rational response to the operation of the dominant economic system characterized by competition and various economic inequalities. The fact that crime is seen as a lack of fulfillment of life's needs caused by the socio-economy concerned [9].

2.3. Radical Criminology Theory

This theory is based on economic determination which is based on the opinion of Karl Max. Karl Max stated that criminal behavior can be explained through economic terminology and is an extension of social conflict. This is because criminal behavior is a form of rebellion against pressure and exploitation [10]. For this reason, Bonger, a criminologist and sociologist from the Netherlands, stated that crime is a social reality and based on the motivation for its occurrence, crime is divided into 4 types, including economic crime, sexual crimes, political crime, and personal crime.

2.4. Strain Theory

Robert K. Merton expanded on the concept of Anomie proposed by Durkheim in 1938 to look at behavioral deviance in American society. The anomistic structure of society leads to class inequality in social and economic conditions in the United States. This is because they need to have exceptional talent or luck to achieve certain goals, members of the lower class or minorities face many challenges due to the difference between facts and estimates, most of the American population is in a state of Strain. Strain Theory assumes that individuals are inherently law-abiding, but being under great stress makes them commit

crimes, It is this disparity between ends and means that exerts a strain. Members of the underclass/minority are particularly burdened, because they must be really talented or very lucky to achieve the goal [10].

2.5. Economic of Crime and Punishment Theory

This theory was developed by Gary Becker (1968) used his assumption of rationality in the economics of crime and punishment applying it to new and different environments while expanding the boundaries of economics. People who commit crimes must consider several things, such as the likelihood of being caught and convicted, the punishment that might be received, the potential value of the existing crime network, and their short-term need for the proceeds of crime. Job seekers are more likely to choose work over crime if more jobs are available and salaries are higher [11].

2.6. Economic Crisis and Crime Theory

In the report of a workshop held in June 1974 by UNDSRI (United Nations Social Defense Research Institute) which discussed the correlation between economic crisis and crime. Some of the conclusions drawn from the discussion are:
- Economic growth is positively correlated with crime.
- Through the measurement of economic indicators at the macro level that are reflected in unemployment, business sluggishness, and loss of purchasing power, there is a sharp increase in the crime rate [9].

2.7. Anomie Theory

The theory of anomie was first proposed by Emil Durkheim, a French sociologist. In simple terms, Durkheim wanted to show that the causes of crime are not only influenced by microeconomic conditions, but also macroeconomic conditions, such as poverty, unemployment, economic instability, and so on. For example, the Great Depression in America led to the country's macroeconomic conditions collapsing, unemployment everywhere and led to higher crime rates because everyone wants to fulfill their needs even if they have to do it in different ways [10].

2.8. Cummulative Causation Theory

This theory was developed by Gunnar Myrdal (1898-1987) who proposed a cumulative cause and effect theory that explains why differences in the level of development in different regions of the country become more larger. There are two consequences of development by developed countries, namely backwash effects and spread effects. Backwash effects are unfavorable outcomes. That the development of more developed regions can create conditions that hinder the growth of more underdeveloped regions. Of the two effects above, according to Myrdal, backwash effects are the strongest. That is, development in rich regions inhibits the growth of poor regions more. This will also encourage crime because of the dissatisfaction felt by the poor [12].

2.9. Social Disorganization Theory

Social disorganization theory was developed by an American psychologist, Clifford Shaw in 1929 and was published in 1942 in collaboration with with his assistant Henry McKay. Social disorganization theory focuses on the spread of high-crime areas that are associated with the the integration of conventional values caused by urbanization, overcrowding, increased immigration, and population, increased immigration, and rapid industrialization [13].

2.10. Ecology Theory

This ecological theory was proposed by Uri Bronfenbrenner in 1979 who looking for sources of crime from the human and social environment, such as population density, population mobility, rural-urban relations, especially urbanization, and areas of crime and slum housing [14].

2.11. Crime Index

Etymologically, criminology comes from the words "crime and logos". Crime means crime and logos means science. Criminology can be interpreted as a science that studies crime. Meanwhile, according to Hardianto (2009) crime has two meanings, namely formal-judicial and sociological. Crimes in formal-judicial terms refer to all behavior that is contrary to the majority of humans, dangerous, and violates the law and criminal law. Sociologically, it is all forms of speech, actions, and behaviors that are economically or politically detrimental to society [15]. Fluctuations or ups and downs in the crime rate can be seen through the crime index. The crime index is the percentage of increase or decrease in crime rate during a year compared to a certain year (base year).

3. Method

The type of research used is quantitative research. Research quantitative aims to show the development of research hypotheses by using research tools to collect data. Based on the type of data used in this research, namely secondary data. The data used are

data on the level of income inequality, unemployment, and urbanization from 5 countries, namely Malaysia, Philippines, Indonesia, Thailand, and Singapore The data used in this study was collected from calculations by Numbeo, the World Income Inequality Database, the World Bank, and the Global Organized Crime Index, from 2012-2022.

The data analysis technique used is the Panel Autoregressive Distributed Lag (ARDL). Panel ARDL aims to analyze the effect of independent variables on the dependent variable over time, both in the long run and short run. The ARDL approach is used because of its flexibility in controlling variables with different levels of integration. The general Panel ARDL model used in this study is:

$$Y_{it} = a_0 + a_1 Y_{it-1} + a_k Y_{it-p} + b_0 X_{it-1} + b_j X_{it-q} + e_{it} \tag{1}$$

4. Results and Discussion

4.1. Descriptive Statistics

Descriptive statistics are a description of the data that can be seen from the average value, standard deviation, maximum, and minimum on each of the variables studied. The dependent variable in this study is the Crime Index and the independent variables are Income Inequality, Unemployment, and Urbanization. The results are as follows:

Table 2. Descriptive Analysis Results

Descriptive Analysis	Crime Index	Income Inequality	Unemployment	Urbanization
Mean	43.02727	40.99818	3.009091	1.840545
Maximum	70.90000	46.30000	4.600000	3.310000
Minimum	15.80000	37.00000	0.300000	-4.170000
Std. Dev	14.54241	2.161317	1.274431	1.016941
Number of Observations	55	55	55	55

Source: Output Eviews 12

Based on the table above:

- From the table above, the distribution of crime index variable data shows a minimum value of 15.80% which is Singapore's figure in 2016, a maximum value of 70.90% which is Malaysia's figure in 2012, with an average value of 43.02% and a standard deviation of 14.54%. These results show that the average crime index in each ASEAN-5 country is relatively small by looking at the proximity of the average and minimum values. While the variance of the data is relatively small by looking at the standard deviation value which is smaller than the average value.
- The table above also shows the distribution for the income inequality variable. This variable is measured by looking at the Gini index number. The data distribution shows a minimum value of 37.00% which is Thailand's figure in 2019, a maximum value of 46.30% which is the Philippines' figure in 2012, with an average value of 40.99%, and a standard deviation of 2.16%. The results show that the average income inequality in each ASEAN-5 country is relatively small by looking at the proximity of the mean and minimum values. While the variance of the data is relatively small by looking at the standard deviation value which is smaller than the mean value.
- The data distribution of the unemployment variable shows a minimum value of 0.30% which is the number belonging to Thailand in 2013, a maximum value of 4.60% which is the number belonging to Singapore in 2021, with an average value of 3.00%, and a standard deviation of 1.27%. The results show that the average unemployment in each ASEAN-5 country is relatively large by looking at the proximity of the average and maximum values. Meanwhile, the data variance is relatively small by looking at the standard deviation value which is smaller than the average value. The data distribution shows a minimum value of 0.30% which is the number belonging to Thailand in 2013, a maximum value of 4.60% which is the number belonging to Singapore in 2021, with an average value of 3.00%, and a standard deviation of 1.27%. The results show that the average unemployment in each ASEAN-5 country is relatively large by looking at the proximity of the average and maximum values. Meanwhile, the data variance is relatively small by looking at the standard deviation value which is smaller than the average value.
- The urbanization variable shows a minimum value of -4.17% which is the number belonging to Singapore in 2021, a maximum value of 3.31% which is the number belonging to Singapore in 2022, with an average value of 1.84%, and a standard deviation of 1.01%. The results show that the average urbanization growth in each ASEAN-5 country is relatively large by looking at the proximity of the average and maximum values. While the variance of the data is relatively small by looking at the standard deviation value which is smaller than the average value.

4.2. Stationarity Test

In this study, the approaches used are ADF-Fisher Chi-square and PP-Fisher with individual intercept and trend. The following are the results of the panel unit root test:

Table 3. Stationarity Test

Variable	Level & First Diff	Intercept/Trend	Prob.		Conclusion
			ADF - Fisher Chi-square	PP - Fisher Chi-square	
Crime Index	Level	Intercept	0.0007	0.0013	I (0)
		Interc. & Trend	0.0031	0.0280	
	First Diff.	Intercept	0.0013	0.0000	
		Interc. & Trend	0.1555	0.0003	
Income Inequality	Level	Intercept	0.1060	0.0056	I (0)
		Interc. & Trend	0.0642	0.0039	
	First Diff.	Intercept	0.0032	0.0002	
		Interc. & Trend	0.0903	0.0046	
Unemployment	Level	Intercept	0.0210	0.0875	I (0)
		Interc. & Trend	0.0007	0.0000	
	First Diff.	Intercept	0.0000	0.0000	
		Interc. & Trend	0.0017	0.0001	
Urbanization	Level	Intercept	0.8320	0.6693	I (I)
		Interc. & Trend	0.0151	0.0006	
	First Diff.	Intercept	0.0001	0.0002	
		Interc. & Trend	0.0010	0.0430	

Source: Output Eviews 12

Based on table 3, shows that the urbanization variable is at the first difference level (1(1)) with a probability value smaller than the 5% significance value. Meanwhile, the Crime Index, Income Inequality, and Unemployment variables are at the level (I(0)) with probability values of 5% and 10% significance values, respectively. The results of this unit roots test indicate the presence of a mixture of I(0) and I(1), which confirms that the use of the ARDL panel model is appropriate for this study.

4.3. Optimum Lag Test

Determination of the optimum lag in this study uses the Akaike Information Criteria (AIC) approach. Selection of the best lag by looking at the smallest AIC value. The results of the optimal lag test can be seen as follows:
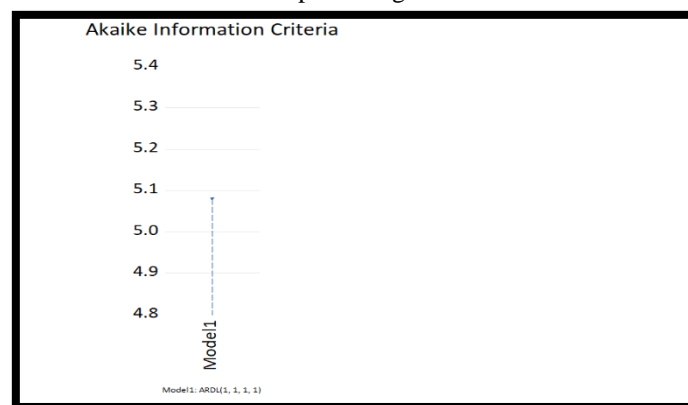

Figure 1. Optimum Lag Test Results Source: Output Eviews 12

The figure above shows that there is only one model in testing the optimal lag that can be used. Therefore, the best lag selection by looking at the AIC value above, the lag used is (1,1,1,1). This means that CRIME or Crime Index has 1 lag, INEQ or Income Inequality has 1 lag, UNEMP or Unemployment has 1 lag, and URBAN or Urbanization has 1 lag.

4.4. Panel Cointegration Test

The cointegration test is used to see whether or not in each dependent and independent there is cointegration in the long run. The following are the results of the cointegration test with Kao's test:

Table 4. Cointegration Test (Kao)

ADF	t-Statistik	Probabilitas
	-1.596211	0.0552
Residual variance	17.69517	
HAC variance	18.72556	

Source: Output Eviews 12

This table presents the results of the cointegration test using the Kao test which shows the prob value of 0.0552. This means that the probability value (0.0552) is at a significant value of 10% (0.1) and if the statistical value of the negative slope coefficient is -1.596211, then the data is considered cointegrated or there is a long-term relationship, so it is stated that all variables used are cointegrated. Thus, it is stated that there is cointegration between income inequality, unemployment, and urbanization with crime index in 5 ASEAN countries in the long run.

4.5. ARDL Panel Model Estimation Results (Autoregressive Distributed Lag)

Below are the results of testing the ARDL Panel for each independent variable on the dependent variable:

Table 5. Output of ARDL Panel Test

Variabel	Coefficient	Std. Error	t-Statistic	Probability
		Long term		
INEQ	0.921549	0.448054	2.056783	0.0495
UNEMP	0.989567	0.621165	1.593082	0.1228
URBAN	21.56452	1.332978	16.17770	0.0000
		Short term		
COINTEQ01	-0.517072	0.264924	-1.951773	0.0614
D(INEQ)	1.262951	1.848634	0.683181	0.5003
D(UNEMP)	-2.753432	1.012373	-2.719779	0.0113
D(URBAN)	0.306069	16.66980	0.018361	0.9855
C	-15.69395	8.376592	-1.873548	0.0719

Source: Output Eviews 12

Based on table 5 the general form of the estimation model obtained is as follows:

$$CRIME_{i,t} = a_0 + a_1 INEQ_{i,t-1} + a_2 UNEMP_{i,t-1} + a_3 DEN_{i,t-1} + \qquad (2)$$

$$\beta_1 INEQ_{i,t-1} + \beta_2 UNEMP_{i,t-1} + \beta_3 URBAN_{i,t-1} + e_{it}$$

By entering the parameter coefficient of each variable contained in Table 4.4, the ARDL (1,1,1,1) estimation model is as follows:

$$CRIME_{5,11} = -15.69395 + 1.262951_{5,11-1} - 2.753432_{5,11-1} + 0.306069_{5,11-1} + 0.921549_{5,11-1} \qquad (3)$$
$$+ 0.989567_{5,11-1} + 21.56452_{5,11-1} + e_{5,11}$$

Based on the table above:
- The CointEq (ECT) value that the coefficient is negative and significant, where the probability value is 0.0614 and the coefficient value is -0.517072. Thus, the value has shown a negative and significant result with a value of 0.0614 < 10%

alpha. This implies that the Panel ARDL model is accepted and a country-by-country panel test can be conducted. Similarly, the ECT coefficient illustrates that if a shock occurs, it takes 6.204864 months or 6.2 months of adjustment time to return to the equilibrium position before the shock.

- In the long run, the income inequality variable has a positive and significant effect on the crime index where the probability value is 0.0495 < alpha 5% with a coefficient value of 0.921549, which means that income inequality affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. Based on these results, it is also explained that if there is a 1% increase in income inequality, it causes an increase in the crime index by 0.921549%. In the short term, the income inequality variable has a positive and insignificant effect on the crime index where the probability value is 0.5003 > 5% alpha with a coefficient value of 1.262951. This result shows a positive trend although it is not significant, so if the income inequality variable experiences a 1% increase, it will cause an increase in the crime index by 1.262951%.

- In the long run, the unemployment variable has a positive and insignificant effect on the crime index where the probability value is 0.1228 > alpha 5% with a coefficient value of 0.989567, which means that if the unemployment variable in Malaysia, Philippines, Indonesia, Thailand, and Singapore has no effect on the crime index. This result shows a positive trend although it is not significant, so when there is a 1% increase in unemployment, it will cause an increase in the crime index by 0.989567%. In the short term, the unemployment variable has a negative and significant influence on the crime index where the probability value is 0.0113 < 5% alpha with a coefficient value of -2.753432, which means that unemployment affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. Based on these results it is also explained that if there is a 1% increase in unemployment then it causes a decrease in the crime index by 2.753432%.

- In the long run, the urbanization variable has a positive and significant effect on the crime index where the probability value is 0.0000 < 5% alpha with a coefficient value of 21.56452, which means that urbanization affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. Based on these results it is also explained that if there is a 1% increase in urbanization, it causes an increase in the crime index by 21.56452%. In the short term, the urbanization variable has a positive and insignificant effect on the crime index where the probability value is 0.9855 > alpha 5% with a coefficient value of 0.306069. This result shows a positive trend although not significant, so when there is a 1% increase in urbanization will cause an increase in the crime index by 0.306069%.

4.6. ARDL Panel Test Results by Country

The ARDL panel test output per country is as follows:

Table 6. Malaysia Country ARDL Panel Output

Variabel	Koefisien	Std. Error	t-Statistik	Probabilitas
COINTEQ01	-1.364311	0.016989	-80.30507	0.0000
D(INEQ)	6.354949	0.886186	7.171120	0.0056
D(UNEMP)	-2.783215	0.610186	-4.561254	0.0198
D(URBAN)	28.77053	121.3634	0.237061	0.8279
C	-27.52698	572.2999	-0.048099	0.9647

Source: Output Eviews 12

Panel ARDL results for Malaysia show that only income inequality and unemployment variables have a significant effect on the crime index with a prob value > 5% alpha. However, income inequality has a positive effect and unemployment has a negative effect. Where income inequality has a probability value of 0.0056 < 1% alpha with a coefficient value of 6.354949. This means that if there is an increase in income inequality by 1%, it will cause an increase in the crime index by 6.354949%.

The unemployment variable has a probability value of 0.0198 < alpha 5% with a coefficient value of -2.783215. This means that if there is an increase in unemployment by 1%, it will cause a decrease in the crime index by 2.783215%. The Cointeq01 value has shown a negative and significant result with a value of 0.0000 < 0.05, which means that the ARDL Panel model is accepted. The ECT coefficient illustrates that Malaysia tends to adjust relatively long with a coefficient value of -1.364311. If a shock occurs, it takes 16.371732 months or 16.4 months of adjustment time to return to the equilibrium position before the shock.

Table 7. Philippines Country ARDL Panel Output (Source: Output Eviews 12)

Variabel	Coefficient	Std. Error	t-Statistic	Probability
COINTEQ01	-0.816367	0.077476	-10.53702	0.0018
D(INEQ)	-0.165362	3.139860	-0.052665	0.9613
D(UNEMP)	-1.927177	9.178062	-0.209976	0.8471
D(URBAN)	-38.53625	816.6942	-0.047186	0.9653
C	-38.67851	513.7870	-0.075281	0.9447

The ARDL Panel results for the Philippines show that none of the independent variables have a significant effect on the crime index with probability values > alpha 1%, 5%, and 10%. And all independent variables have a negative effect. The ECT coefficient illustrates that the Philippines tends to adjust relatively quickly with a coefficient value of - 0.816367. This means that if a shock occurs, it takes an adjustment time of 9.796404 or 9.8 months to return to the equilibrium position before the shock.

Table 8. Indonesia Country ARDL Panel Output

Variabel	Coefficient	Std. Error	t-Statistic	Probability
COINTEQ01	-0.410132	0.001839	-223.0030	0.0000
D(INEQ)	4.258959	1.740482	2.447000	0.0919
D(UNEMP)	-4.535057	0.946596	-4.790911	0.0173
D(URBAN)	-34.06074	154.1385	-0.220975	0.8393
C	-18.05327	48.88401	-0.369308	0.7364

Source: Output Eviews 12

Panel ARDL results for Indonesia show that only income inequality and unemployment variables have a significant effect on the crime index with prob values < 5% and 10% alpha. However, income inequality has a positive effect and unemployment has a negative effect. Where income inequality has a probability value of 0.0919 < alpha 10% with a coefficient value of 4.258959. This means that if there is an increase in income inequality by 1%, it will cause an increase in the crime index by 4.258959%.

The unemployment variable has a probability value of 0.0173 < alpha 5% with a coefficient value of -4.535057. This means that if there is an increase in unemployment by 1%, it will cause a decrease in the crime index by -4.535057%. The Cointeq01 value has shown a negative and significant result with a probability value of 0.0000 < 0.05, which means that the ARDL Panel model is accepted. The ECT coefficient illustrates that Indonesia tends to adjust relatively quickly with a coefficient value of - 0.410132. This means that if a shock occurs, it takes an adjustment time of 4.921584 or 5 months to return to the equilibrium position before the shock.

Table 9. Thailand Country ARDL Panel Output

Variabel	Coefficient	Std. Error	t-Statistic	Probability
COINTEQ01	-0.146428	0.020567	-7.119573	0.0057
D(INEQ)	0.081196	0.269530	0.301251	0.7829
D(UNEMP)	-5.102946	23.93009	-0.213244	0.8448
D(URBAN)	45.66289	2235.990	0.020422	0.9850
C	-1.487751	60.40434	-0.024630	0.9819

Source: Output Eviews 12

Panel ARDL results for Thailand show that none of the independent variables have a significant effect on the crime index with a probability value > alpha 5%. The Cointeq01 value has shown a negative and significant result with a value of 0.0057 < alpha 5%, which means that the Panel ARDL model is accepted. The ECT coefficient illustrates that Thailand tends to adjust relatively quickly with a coefficient value of -0.146428. This means that if a shock occurs, it takes an adjustment time of 1.757136 or 1.8 months to return to the equilibrium position before the shock.

Table 10. Singapore Country ARDL Panel Output

Variabel	Coefficient	Std. Error	t-Statistic	Probability
COINTEQ01	0.151877	0.006998	21.70162	0.0002
D(INEQ)	-4.214988	4.883285	-0.863146	0.4515
D(UNEMP)	0.581235	6.782470	0.085697	0.9371
D(URBAN)	-0.306084	0.362717	-0.843866	0.4607
C	7.276750	20.67582	0.351945	0.7482

Source: Output Eviews 12

Panel ARDL results for Singapore show that no independent variable has a significant effect on the crime index with a probability value > alpha 5%. The Cointeq01 value shows a positive and significant result with a value of 0.0057 < 5% alpha. The ECT coefficient illustrates that Singapore is relatively fast in terms of adjustment with a coefficient value of 0.151877. This means that if a shock occurs, it takes an adjustment time of 1.822524 or 1.8 months to return to the equilibrium position before the shock.

4.7. Discussion

4.7.1. Influence of Income Inequality on Crime Index

In the long run, the income inequality variable has a positive and significant effect on the crime index where the probability value is $0.0495 < \text{alpha } 5\%$ with a coefficient value of 0.921549, which means that income inequality affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. Based on these results, it is also explained that if there is a 1% increase in income inequality, it causes an increase in the crime index by 0.921549%. In the short term, the income inequality variable has a positive and insignificant effect on the crime index where the probability value is $0.5003 > \text{alpha } 5\%$ with a coefficient value of 1.262951. This means that if the income inequality variable experiences a 1% increase, it will cause an increase in the crime index by 1.262951%.

The results in the long run are in accordance with the research hypothesis and in accordance with the theory put forward by Richard A. Clowerd in the theory of Differential Opportunity Structure, Robert K. Merton in the theory of Strain, David M. Gorden in the theory of Critical Criminology, and Karl Max in the theory of Radical Criminology which explains that crime or criminal acts generally occur in social environments characterized by most of the citizens having low income. Individuals who are unsuccessful in their lives will be more depressed when faced with the success of the community around them. And if the higher the inequality in the area, the greater the pressure experienced by individuals and the greater the opportunity for individuals to commit crimes.

This is also in line with the research of Buba, et al. (2018) with the title Income inequality and property crime in selected southern and eastern european countries [16]. Zaman & Khan's research (2021) entitled Dynamics of crime rate, income inequality and urbanization across regimes in Pakistan [17]. And research conducted by Lobont, et al. (2017) entitled The effect of socioeconomic factors on crime rates in Romania: A macro-level analysis. The results of this study state that income inequality has a positive and significant effect on crime [18]. This is because large income differences between rich and poor groups often lead to a sense of injustice and frustration among the community, income inequality in ASEAN has a positive and significant impact on crime because less well-off groups have more limited access to education, employment, and health services. This can lead to criminal behavior as a form of venting.

The results in the short term show that income inequality has a positive and insignificant effect on crime. These results are in accordance with research conducted by Edwart and Azhar (2019) entitled The Effect of Education, Population Density, and Income Inequality on Criminality in Indonesia [19]. As well as research conducted by Sukma and Marta (2024) with the title Determinants of Property Crime Rates in Indonesia [20]. These results also show a weak or insignificant relationship between income inequality and crime. This means that other factors, such as education levels, domestic investment, and infrastructure development also play an important role in reducing crime rates [21].

The insignificant results suggest that changes in income inequality take a long time to start affecting social dynamics and criminal behavior. Therefore, in the short term, individuals and society have not yet felt the full impact of income inequality, so there has not been a significant increase in crime rates. Furthermore, government interventions also play a major role in reducing crime in their respective countries, such as providing social assistance, subsidies, or poverty alleviation programs. These effective social policies can reduce the pressures associated with income inequality that can drive individuals from underprivileged groups to commit crimes as a way to improve their welfare.

For the ARDL Panel results by country alone. Philippines, Singapore, and Thailand show insignificant results for income inequality on crime index. The Philippines has a negative and insignificant effect because the Philippines diversified its economy by developing a stronger industrial sector to create productive employment opportunities that allow anyone to gain access to multiple sources of income. Therefore, when the economy offers more opportunities, criminal activity as a way to address inequality may be reduced. Singapore also has an insignificant negative effect because Singapore has a very strict legal system and effective law enforcement, so income inequality remains low despite income inequality. In addition, Singapore's culture also emphasizes social harmony and stability, which does not affect crime as much as in other countries. Meanwhile, Thailand has a positive and insignificant effect because the Thai government has implemented various social and economic policies aimed at reducing the impact of income inequality. One of them is by revitalizing the economy. In addition, the provision of assistance by the state to low-income households and micro-entrepreneurs such as the OTOP (One Tambon One Product) program that encourages the development of typical products in each village or community to be traded in domestic or international markets, indirectly helps improve living standards and reduce poverty.

4.7.2. Influence of unemployment on crime index

In the long run, the unemployment variable has a positive and insignificant influence on the crime index where the probability value is $0.1228 > \text{alpha } 5\%$ with a coefficient value of 0.989567, which means that if the unemployment variable in Malaysia, Philippines, Indonesia, Thailand, and Singapore has no effect on the crime index. Based on these results, it is also explained that if there is a 1% increase in unemployment, it causes an increase in the crime index by 0.989567%. In the short term, the unemployment variable has a negative and significant influence on the crime index where the probability value is $0.0113 < \text{alpha } 5\%$ with a coefficient value of -2.753432, which means that unemployment affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. Based on these results, it is also explained that if there is a 1% increase in unemployment, it causes a decrease in the crime index by 2.753432%.

The results of this study are not in accordance with the theory put forward by Gery Becker in the Economic theory of Crime and Punishment as well as Emil Durkheim in the theory of Anomie and the theory of Economic Crisis and Crime which states that the causes of crime are not only influenced by microeconomic conditions but also macroeconomics, such as poverty, unemployment, economic instability, and so on.

The results of this study are in line with research conducted by Hachica and Triani (2022) with the title The Effect of Education, Unemployment, and Population Density on Criminality in Indonesia [22]. As well as research conducted by Jeke et al. (2021) with the title Crime and economic development in South Africa: a panel data analysis, which states that unemployment has a positive but insignificant effect on crime [23].

The positive but insignificant effect here is because unemployed people have the knowledge not to plunge directly into crime. In addition, many educated unemployed people contribute to the increasing unemployment rate. According to data from the PBB (2021), the highest unemployed are those who are educated, which includes 89,353 thousand people, or 58.28 percent of the total unemployed, including high school, diploma, and college graduates. The lowest open unemployment rate is 41.72 percent of those with junior high school education and below. Generally, people with higher education have more rational thoughts about how to earn money so they will not commit criminal acts [24]. In addition, ASEANAPOL (ASEAN Chiefs of National Police) is a forum for police chiefs of ASEAN countries to formulate and combat transnational crime. Thus, with these policies, the impact of unemployment does not have a significant influence on crime.

Increased criminality can be caused by other factors and people who are unemployed do not mean going straight to crime but will think further ahead to get income such as opening business opportunities and others. This research is also in line with Harahap's (2014) research which states that the level of unemployment has a positive but insignificant effect on crime, where people who are not working do not immediately think of committing crimes [25]. In addition, unemployment does not always lead to crime because of the role of the government that provides assistance or informal work to meet their needs without turning to crime. In addition, an increase in unemployment may result in increased community policing as more people stay at home, reducing opportunities for crime [26].

The results in the short term show that unemployment has a negative and significant effect on crime. Therefore, if the unemployment rate rises, then crime will fall. Conversely, the more unemployment decreases, the more crime will increase. This is in accordance with research conducted by Nurfatmawati and Nurhayati (2023) with the title Analysis of Economic Factors Affecting Crime in West Sumatra Province in 2018-2021 [27]. As well as research conducted by Kasim and Hendra (2023) with the title The Effect of Unemployment and Poverty on Criminal Acts in Tolitoli Regency for the Period 2012-2021, which shows that the high unemployment rate is caused by several factors, including the existence of new graduates from universities who are selective in finding work, many graduates are reluctant to take jobs because they are considered not in accordance with their educational background [28]. As a result, these graduates are not only unemployed but also not working at all. People who are highly educated and unemployed will have more rational thinking, have the ability to try other ventures, and tend to avoid unlawful activities, making them less likely to commit crimes.

4.7.3. Influence of urbanization on crime index

In the long run, the urbanization variable has a positive and significant effect on the crime index where the probability value is 0.0000 < 5% alpha with a coefficient value of 21.56452, which means that urbanization affects the crime index in Malaysia, Philippines, Indonesia, Thailand, and Singapore. If the urbanization variable increases, it will cause an increase in the crime index by 21.56452. Based on these results it is also explained that if there is a 1% increase in urbanization, it will cause an increase in the crime index by 21.56452%. In the short term, the urbanization variable has a positive and insignificant effect on the crime index where the probability value is 0.9855 > alpha 5% with a coefficient value of 0.306069. That is, if the urbanization variable increases, it does not cause an increase in the crime index.

The results in the long run are in accordance with the research hypothesis and in line with the Cummulative Causation theory developed by Gunnar Myrdal, Social Disorganization Theory proposed by Clifford Shaw and Henry McKay. And also in accordance with the Ecological theory proposed by Uri Bronfenbrenner. This theory focuses on high-crime areas that are associated with the integration of conventional values caused by urbanization, overcrowding, increased immigration, and rapid industrialization.

The results of this study are also in line with research conducted by Zaman and Khan (2021) entitled Dynamics of crime rate, income inequality and urbanization across regimes in Pakistan [29]. Kuciswara's research (2018) entitled The effect of urbanization, poverty level, and income inequality on crime in East Java Province [30]. And research conducted by Sharif, et.al. (2016) entitled An economic disaster correlation with crime and its determinants, a temporal analysis and case study of Pakistan [31]. The results of these studies state that urbanization has a positive and significant effect on crime. Various social problems have been caused by urbanization, one of which is crime that occurs in all urban areas in both developed and developing countries. As unemployment continues to rise and coupled with increasing poverty among the urban poor, unimaginable levels of global urbanization are now occurring in many areas around the world. Crime is not uniform, but varies geographically. Property crimes are more common in some places, but ongoing people crimes also known as violence are more common in others.

The movement of people from villages to cities is called urbanization, which causes urban areas to become denser. Urbanization promotes industrialization and economic growth. Job creation, poverty alleviation, and local business development

are planned in urban areas as people in urban areas seek employment. Many villagers flock to urbanization to change their fortunes. However, the low quality of the villagers' labor force and the high competition for formal sector jobs as urban dwellers have better human resources compared to villagers force them to work in the informal sector. However, many of them are unemployed or underemployed. Urban population growth in cities is increasing from year to year, but is not accompanied by the development of facilities and infrastructure to support socio-economic life. This causes various complex problems such as the many acts of crime that occur in urban areas. The positive relationship between the level of urbanization and crime reflects that urbanization is the cause of reduced employment opportunities in urban areas which can encourage individuals to commit crimes.

The results in the short term show that urbanization has a positive and insignificant effect on crime because people who have just moved to the city are usually still in the process of adaptation, so in a short time they still maintain social values. Therefore, the effect of urbanization on crime takes a longer time to be significant.

For the ARDL Panel results by country. Malaysia, Thailand, Singapore, Indonesia, and Philippines show insignificant results on crime. Malaysia and Thailand have a positive and insignificant effect on crime because urbanization is often associated with economic improvement and better job opportunities in cities such as encouraging household consumption, investment, and government spending that drives economic expansion [32]. Meanwhile, the Philippines, Indonesia, and Singapore have a negative and insignificant effect. This is because Singapore has a very strict and efficient law enforcement, so this country is known for its zero tolerance policy towards crime because the government managed to integrate strict security so that urbanization does not directly affect crime [33]. In the Philippines and Indonesia when urbanization declines, economic growth in urban areas slows down and employment opportunities also decline and many people will face economic hardship which encourages criminal activity.

5. Conclusion

Based on the results of the analysis and discussion that has been carried out regarding the effect of income inequality, unemployment, and urbanization on the crime index in 5 ASEAN countries, the following conclusions can be drawn:

- Income inequality in the long run has a positive and significant effect. While in the short term, it has a positive and insignificant effect on the crime index for five ASEAN countries simultaneously. For each country, Malaysia and Indonesia have a positive and significant effect, Philippines and Singapore have a negative and insignificant effect, while Thailand has a positive and insignificant effect on the crime index.
- Unemployment in the long run has a positive and insignificant effect. Meanwhile, in the short term, it has a negative and significant effect on the crime index for 5 ASEAN countries simultaneously. For each country, Malaysia and Indonesia have a negative and significant effect, Philippines and Thailand have a negative and insignificant effect, while Singapore has a positive and insignificant effect on the crime index.
- Urbanization in the long run has a positive and significant effect. While in the short term has a positive and insignificant effect on the crime index for 5 ASEAN countries simultaneously. For short-term countries, Philippines, Indonesia, and Singapore have a negative and insignificant effect, while Malaysia and Thailand have a positive and insignificant effect on the crime index

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