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The Relationship between Economic Growth and Child Abuse in Malaysia

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Abstract

The purpose of this study is to examine the effect of economic growth on child abuse by introducing a Kuznets curve of abuse. This study employs the ARDL approach to analyse data on GDP per capita, inflation, unemployment, and the number of child abuse cases in Malaysia from 1988 to 2018. The study has several limitations to be taken into consideration. A lack of data on determinants such as divorce and poverty rates has limited this study in the scope of its analysis. Therefore, including these determinants in further research will build upon the findings of this study. The findings of this study are important for policymakers to formulate appropriate policies and approaches towards boosting economic growth, as higher GDP per capita in the final stages of the given timeframe, can reduce child abuse cases. Economic growth has not been considered by previous studies to be a factor in child abuse. This study introduces a Kuznets curve of abuse that seeks to explain the relationship between income per capita and child abuse cases.

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1. Introduction

The issue of child abuse has been discussed in innumerable studies across various countries and is by no means a new area of research. Child abuse is defined by the NSPCC (2020) as 'the intentional harming of a child by an adult or another child'. In terms of what constitutes a child, the generally accepted definition, and that given by the United Nations Convention on the Rights of the Child (UNCRC) defines a child as anyone under the age of 18 (NSPCC, 2020). Similarly, according to the World Health Organization (WHO) (2020), child abuse can be defined as abuse and neglect that occurs towards children who are under the age of 18. Child abuse as a term takes into account all forms of abuse, including physical and emotional mistreatment, sexual abuse, neglect, etc. Child abuse has been shown to have a negative impact on children's health and development, with adverse long-term and societal consequences, as children who have been abused are more likely to abuse others when they are adults. Abused children also display a higher tendency towards criminality. This issue is of great importance at a societal level due to the potential incidence of serious crime and anti-social behaviour associated with child abuse, the long-term effects of which can cause significant damage in a number of areas. These implications emphasize the importance of further research into this area.

To formulate relevant policies that are aimed at reducing child abuse rates, it is imperative that a meticulous investigation into the factors involved in child abuse be carried out. A vast array of previous studies has identified several relevant factors, including divorce, unemployment, poverty, among others. Frioux (2014), Raissian (2015), Shaari et al. (2015), and Brown and De Cao (2018) observed a relationship between unemployment and child abuse. Unsurprisingly, the loss of gainful employment was shown to have serious repercussions for a family. Incidences of child abuse are often more prevalent within unemployed households, likely due to heightened levels of stress. This implies that a higher unemployment rate, especially during an economic recession, can contribute to a higher number of child abuse cases. A number of studies, such as Shaari et al. (2019), Bywaters et al. (2016), and Cancian et al. (2010) also demonstrated a link between incidences of poverty and child abuse. Findings suggest that families with a low socioeconomic status are more likely to be involved in abuse.

However, none of the aforementioned studies have considered economic growth as a potential determinant of child abuse cases. To explain how economic growth can affect child abuse, this study adopts the Kuznets curve introduced by Kuznets (1955). The hypothesis of the Kuznets curve states that higher income per capita can cause income inequality to increase in the early stages of a given time frame, and as the economy grows and industrialization begins to take place, income inequality deepens. However, in the later stages, higher income per capita will inevitably lead to lower income inequality. This exhibits an inverted U-shape which can be observed in Figure 1 below. This hypothesis has been adapted by Grossman and Krueger (1995) who introduced the environmental Kuznets curve which hypothesizes that higher income per capita can lead to higher environmental degradation in the early stages but lower environmental degradation in the final stages of a given time period, as development occurs.

Therefore, this study attempts to introduce a Kuznets curve of abuse to explain the relationship between income per capita and child abuse cases. This is illustrated by Figure 1. When a country emphasizes increasing productivity in the early stages people are likely to find themselves working longer hours than previously whilst receiving higher financial remuneration. Due to worsened levels of exhaustion, the workers in question are likely vulnerable to experiencing stress. As a result, it is reasonable to assume that these overworked individuals will vent their heightened stress on their children. However, in the later stages of development, as the economy continues to grow, child abuse cases are expected to drop. This situation is influenced by advances in technology which can reduce stress at the workplace.

Flexible working hours can also allow workers more adequate time for recreation and to spend with their children. In addition to that, the validation of the Kuznets curve of abuse may be a positive sign for the nation as rapid development in the country does not appear to cause a higher incidence of child abuse cases. With higher economic growth, the government may expect to generate a greater level of income through taxation. Higher income could be utilized in opening a number of child-care centres in locations such as offices, which would benefit working parents, who would then be able to monitor their children closely. Of course, a positive outcome relies on the appropriate application of this increased funding by governmental organizations. Higher GDP per capita indicates the prosperity of a country. As the poverty rate drops, the probability of children being neglected or abused should be reduced. This was supported by Berger et al. (2017) who stated that child abuse rates fall as income increases. Monahan (2020) also found that income instability in Milwaukee County, particularly in low-income families who are more likely to experience stress, can lead to an increase in cases of child abuse. This implies that the inverse can be assumed, wherein increased income can result in a decrease in child abuse cases.

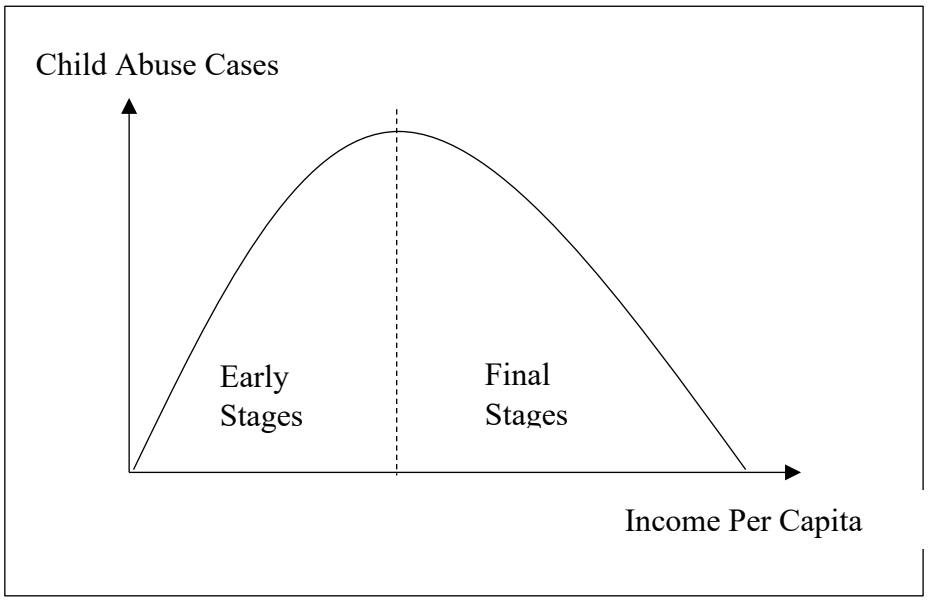

Figure 1: Abusive Kuznets Curve

This study focuses on Malaysia, where a steady increase in child abuse cases has been observed. According to the Department of Social Welfare, Malaysia, child abuse cases in Malaysia exhibited an upward trend over a 21-year period from 1998 to 2019. The country recorded a slight decrease in 2009 when the number of reported child abuse cases fell to below 1,000. Malaysia reported the largest ever number of child abuse cases in 2019 at 6,061. In the absence of meticulous research into the determinants of child abuse, a continuous increase is expected over the following years. It is likely that a great number of child abuse cases go unreported due to various social factors, such as shame, intimidation, a lack of access to police support, etc., with some researchers suggesting that as little as 10% of cases of child abuse are reported (Karlsson & Karkara, 2003; Muda & Alwi, 2012). In terms of measuring the upward trend of cases in Malaysia, we can assume an increase, as methods of recording child abuse rates remained mostly unchanged and constant over the 21-year period, with data taken from police reports and the department of social welfare. It is possible, however, that the introduction of the Child Act of Malaysia, 2001, may have led to an increase in reporting of child abuse cases in later years, as this act required medical doctors, family members, and child care

providers to report a child who is physically or emotionally injured as a result of being illtreated, neglected, abandoned or exposed, or who is sexually abused, to the social welfare officers or police, and this should be taken into account as an external variable which may undermine the accuracy of the reported increase. Cases of child abuse tend to be reported by professionals, such as doctors, teachers, medical staff, who observe children with evidence of abuse, and these cases are generally reported via the child abuse hotline (*Talian Nur*). The definition of child abuse employed by the country has also remained consistent over the same period, following the WHO violence injury and prevention team guidelines established in 1999, so this provides support to the observed increase in the number of reported child abuse cases (Myhealth 2021).

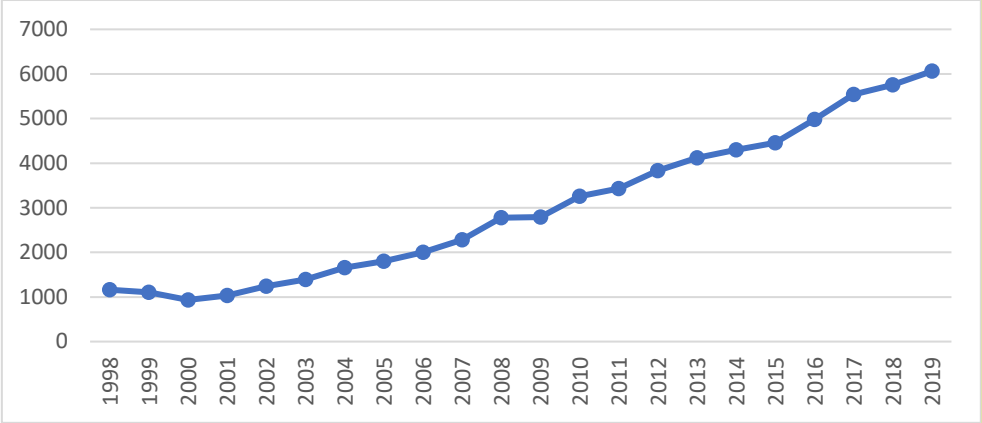

Figure 2: Reported Child Abuse Cases in Malaysia (1998-2019)
Source: Department of Social Welfare, Malaysia

As many as 2,000 cases were reported each year, an unusually high number, and an alarming trend, necessitating investigation and an improved understanding in order to mitigate the adverse effects for children. Table 1 shows the number of reported child abuse cases by type in 2016 and 2017. The number of physical and sexual abuse cases each increased in 2017 while emotional abuse, negligence, and abandonment dropped. The number of physical cases rose by 291 to 1,594 cases in 2017 compared to the previous year with 1,303 cases. The number of sexual abuse cases soared by 344 to 1,378 cases in 2017 in comparison with 2016. The number of emotional abuse cases dropped by 37 cases from 98 cases in 2016 to 61 cases in 2017. Based on the table, it can be observed that negligence contributed the largest share of the total number of cases at 40% in 2017 and 45% in 2016. Emotional abuse accounted for the smallest share of the total number of cases at 1% in 2017 and 2% in 2016.

Table 1: The Number of Child Abuse Cases by Type

Types of Abuse	**2016**	**2017**
Physical	1,303	1,594
Sexual	1,034	1,378
Emotional	98	61
Negligence	2,245	2,184
Abandonment/ No Parents	145	138
Others	137	67
Total	**4,982**	**5,422**

Source: Department of Social Welfare Malaysia (2019)

According to the World Bank (2020), Malaysia was plunged into recession in 1985 when its economic growth stood at -1.02%. This is generally attributed to the oil crisis at that time and an increase in interest rates. The unemployment rate hit 5.6% at the time. In the following year, a gradual recovery took place when economic growth in the country hit 1.24%. The economy was once again embroiled in recession in 1998 due to the currency crisis. The ringgit fell dramatically. Malaysia's economy fell by 7.36% and then increased by 6.14% in 1999. Figure 3 shows GDP per capita in Malaysia from 1998 to 2019. The figure demonstrates an increase in GDP per capita over the period. A drop of 9.67% was then observed in 1998 followed by an increase of 3.58% in 1999. Malaysia faced an economic recession again in 2009 with economic growth of -1.51%, and GDP per capita dropped by 3.29%. This second recession was the result of the financial crisis that greatly affected the United States' economy. The economy then began to grow with a hefty increase of 7.42% the following year. Based on Figures 2 and 3, it can be observed that Malaysia is in the early stages of the Kuznets curve in which GDP per capita increases can lead to higher child abuse cases.

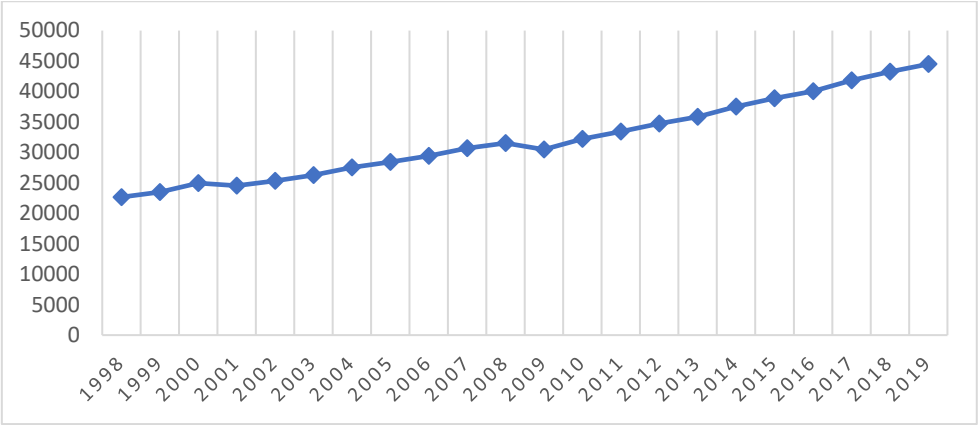

Figure 3: Gross Domestic Product (GDP) Per Capita in Malaysia (1998-2019)
Source: World Bank

Table 2 shows Malaysia's GDP by sector at constant 2015 prices in 2016 and 2017. Based on the table, it can be observed that the services sector contributed the largest share of the total GDP in 2017 at 55.6%, followed by the manufacturing sector (22.3%), and mining and quarrying (8.1%). The construction sector accounted for the smallest share of total GDP at 4.9%.

Table 2: GDP by Kind of Economic Activity at Constant 2015 Prices in Malaysia

Year	**2017 (RM million)**
Agriculture, Livestock, Forestry and Fishing	99,508.78
Mining and Quarrying	105,837.80
Manufacturing	290,463.70
Construction	63,521.68
Services	72,3360.7
Plus : Import Duties	18,076.35
GDP at Purchasers' Prices	**1,300,769**

Source: Department of Statistics, Malaysia

2. Literature Review

Child abuse has become an essential topic of debate among policymakers. Child abuse negatively impacts victims such that it leads to poor health conditions, social and emotional difficulties, and a decline in economic productivity. Wood et al. (2012) investigated the association between local macroeconomic indicators and the admission rates of physical abuse sufferers to 38 pediatric hospitals, based on the database of the Pediatric Hospital Information System in the United States. The results showed that child abuse rates have a significant relationship with the rate of unemployment in major metropolitan areas. However, Linda et al. (2013) showed that economic conditions have no significant relationship with child abuse rates in California, evidenced in her study based on county-level data related to child abuse, gathered from the California Department of Justice from the year 1996 to 2009.

Additionally, Henry et al. (2018) investigated how childhood abuse affects adulthood financial strain. They also investigated the degree to which substance abuse and depressive symptoms among adolescents, decreased educational achievement, and the first birth timing mediate this effect. Using data from a longitudinal panel study (Rochester Intergenerational Study, Rochester, New York) collected between 1988 and 2016 involving 496 parents, the results showed that child abuse, directly and indirectly, had an impact upon the subsequent financial strain of a victim, during their adulthood. Additionally, as indicated by Fang et al. (2012) in their incidence-based study on the average lifetime costs for each child abuse victim, and the total lifetime costs relative to each new case of child abuse in 2008, prevention efforts are crucial for addressing the high incidence of child abuse, considering that the financial burden of child abuse is significant. Based on the sensitivity analysis, a figure of $585 billion was estimated as the total impact from resulting losses to productivity. A similar result was reported by Fang et al. (2015) in their subsequent study based in the Pacific Region and East Asia, in which the economic burden of child abuse was found to be significant. Following these findings, the researchers emphasized the need to respond to and prevent child abuse in the region.

A similar study by Letouneau et al. (2018) estimated the economic impact, on the United States, of child sexual abuse (CSA) based on the best accessible secondary data in developing the cost for each case estimate. The findings estimated 20 new fatal CSA cases and 40,387 newly confirmed non-fatal CSA cases in the year 2015, whereas the CSA economic burden of lifetime was around $9.3 billion. Meanwhile, on average, the lifetime cost involving fatal CSA victims was found to be $1,128,334 for each female victim and $1,482,933 for each male victim. Notwithstanding, on average, the cost of lifetime involving non-fatal CSA victims is $282,734 relative to each female victim and $74,691 relative to each male victim, despite the lack of data on productivity losses. Peterson et al. (2018) echoed these findings by investigating the annual economic burden, on the United States population, of child abuse by using updated estimation data. Based on the updated data, the results showed that the intangible costs to victims and the community have led to a considerable increase in the approximate cost of child abuse when compared to the previous data. Given the significance of the economic burden of child abuse, the cost of evidence-based interventions can be displaced while they are used to mitigate the incidence of child abuse.

To relatively establish the number of CSA cases in Botswana, Ramabu (2020) utilized the data and descriptions given by specialist informants based on the available data on CSA, which the researcher acquired from the records of the Botswana police services, including statistics from 2013 to 2016. Based on the data, there were 97 cases of child rape (0.2%) in 2013 with a total of 901 children reportedly falling pregnant, which was around ten times as many as the number of rape cases. It should be noted that a total of 1,058 children also did not attend school during the same year, 2013. The study deduced that CSA contributed to an

escalation in the social and economic problems faced by Botswana. Additionally, Berger et al. (2012) explored the factors of the economy and the consequences of child abuse as well as child neglect based on theoretical and empirical findings from various fields of studies in advanced industrial countries. The results from the study showed that economic resources significantly influence the risk of child neglect and child abuse, despite the elusive nature of causal evidence thus far. The existing data on child neglect and child abuse shows that these crimes have inflicted enormous costs to both victims and society in the long run, indicating a need for greater efforts to mitigate child abuse.

In another study, Azi and Saluhu (2016) investigated how child abuse affects school children's academic performance as well as its implication on the economy of Nigeria. Based on their findings, 24.6 percent of Nigerian children were abused every year, thus affecting the Nigerian economic growth adversely. Apart from that, Millet et al. (2011) investigated the extent of relationships between the rates of unemployment, the participation of the labor force, and the use of food stamps with child abuse as well as child neglect (CAN) aggregate rates derived from seven state-level data in the United States. The results from bivariate correlation and OLS regression analyses showed an inconsistently weak association that involves the economic indicators with the rates of maltreatment. Additionally, in a very recent and similar study, Fontaine and Pines (2020) investigated the extent to which the relationship that involves macroeconomic recessions with child abuse cases contradicts the income inequality level in 48 states in the United States. The data were acquired from the National Child Abuse and Neglect Data System (NCANDS), focusing on child abuse cases between 2004 and 2013, and a fixed-effect regression technique was employed in the study. Based on the results, involuntary job losses significantly influenced the increase in physical abuse cases compared to other kinds of child abuse. The study further revealed that the case reports had a significant impact on physical abuse and others, which reportedly were the highest in the states with a considerably low level of income disparity. Such situations could be due to the worse reemployment opportunities in the states with low inequality where the families' stress levels are higher in addition to job loss uncertainty. Pasian et al. (2020) in the context of Brazil discussed how negligent families are similar and different from other families based on risk and socioeconomic elements of child neglect, involving 90 parents with children between 6-8 years old. The outcome rendered poverty not an influential factor towards child neglect; however, poverty is demonstrated as an extremely favorable circumstance that expresses neglect.

Based on this review, it can be concluded that insufficient literature on child abuse relative to economic growth using the Kuznets curve has driven the researchers to undertake this study.

3. Methodology

This study employs the ARDL approach to examine the effect of economic growth on child abuse in Malaysia and also to support the hypothesis of the Kuznets curve of abuse. Data on the number of child abuse cases, the number of people in unemployment, and consumer price index were collected and analyzed from 1988 to 2018. The data on the number of child abuse cases were collected from the Department of Social Welfare Malaysia while the data on total unemployment and consumer price index were collected from the Department of Statistics Malaysia. The data on GDP per capita were collected from the World Bank. This study estimates the effect of economic growth on child abuse in Malaysia using the ARDL procedures introduced by Pesaran et.al (2001). The study adopts the Kuznets curve model which illustrates the non-linear relationship between income per capita and inequality. Therefore, the econometric equation for the abusive Kuznets curve as follows:

$$CA_t = \alpha + \beta_1 GDP_t + \beta_2 GDP_t^2 + \varepsilon_t \quad (1)$$

Where CA represents child abuse and GDP represents income per capita. α represents the CA-intercept. . β_1 and β_2 are the parameters. ε represents the error term. The non-linear model exhibits an inverted U-shape. The data on the variables are transformed into the logarithms to have a linear regression model. Thus, the model is as follows:

$$\ln CA_t = \emptyset + \partial_1 \ln GDP_t + \partial_1 \ln GDP_t^2 + u_t \quad (2)$$

This study also uses some control variables based on previous literature, namely unemployment and inflation. Therefore, the model specification as follows:

$$\ln CA_t = \delta + \rho_1 \ln GDP_t + \rho_2 2\ln GDP_t + \rho_3 \ln CPI_t + \rho_4 \ln UN_t + \mu_t \quad (3)$$

Where lnCA represents the log of child abuse, GDP represents the log of GDP per capita, CPI represents the log of consumer price index (CPI), and lnUN is the log of unemployment.

Table 3: Variable Description

Variable name	Proxy	Symbol	Unit measurement
Child Abuse	The number of child abuse cases	CA	Number of cases
Economic Growth	Gross Domestic Product Per Capita (constant Local Currency Units (LCU).	GDP	Malaysian ringgits
Inflation	Consumer Price Index (CPI)	CPI	Index
Unemployment	The number of unemployed people	UN	Number of people

Before we can use the ARDL approach, a unit root test must be conducted to examine the stationary of the time series data. This is because the data used for all of the variables might have a unit root. If this problem exists, our estimation of the regression model might be false, leading to an inaccurate conclusion and policy implementation. There are many approaches to examine the stationary of the data, such as Augmented Dickey Fuller (ADF), Phillips Perron (PP), Kwiatkowski Phillips Schmidt Shin (KPSS), etc. However, the ADF approach is widely utilized in previous studies. The model is as follows:

$$\Delta Y_t = \beta_1 + \beta_2 + \delta Y_{t-i} + \alpha_i \sum_{i=1}^{m} Y_{t-i} + \varepsilon_t \quad (4)$$

Where Y is the variable, is the difference operator, t is the time trend, and is the white noise residual. The hypothesis for the unit root test is as follows:

H_0: $\delta = 0$ (Y has unit root)
H_0: $\delta \neq 0$ (Y has no unit root)

The next step in the ARDL procedure is that to employ the bound testing approach to see whether there is a co-integrating relationship among the variables. The approach is suitable for a small sample size. It can also estimate a long-run linear regression model in the presence of co-integration among the variables. Several other co-integration methods can be employed, such as Engle-Granger (1987) and Johansen (1988), to examine the stationarity of the data. However, the other methods require all the variables are integrated in the same order. The order

of integration for the ARDL approach can be purely I(0) and I(I) or mixed. Therefore, the null hypothesis (H_0: $\delta_1 = \delta_2 = \delta_3 = \delta_n = 0$) of this study indicates that there is no-integration, and thus this means that there is no long-run relationship. The alternative hypothesis (H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_n \neq 0$) of this study indicates there is a long-run relationship. The equation to be tested is as follows:

$$\Delta \ln CA_t = \alpha_0 + \delta_1 \ln CA_{t-1} + \delta_2 \ln GDP_{t-1} + \delta_3 2\ln GDP_{t-1} + \delta_4 \ln CPI_{t-1} + \delta_5 \ln UN_{t-1} + \sum_{i=1}^{p} \partial_1 \Delta \ln CA_{t-i} + \sum_{i=1}^{p} \partial_2 \Delta \ln GDP_{t-i} + \sum_{i=1}^{p} \partial_3 \Delta 2\ln GDP_{t-i} + \sum_{i=1}^{p} \partial_4 \Delta \ln CPI_{t-i} + \sum_{i=1}^{p} \partial_5 \Delta \ln U_{t-i} \varepsilon_t \quad (5)$$

According to Pesaran (2001), if the F-statistic is higher than the upper bound, this indicates that the null hypothesis is rejected, and thus there is co-integration. A long-run relationship does exist. However, if the F-statistic is lower than the lower bound, the alternative hypothesis is rejected, and thus there is no co-integration. The long-run relationship does not exist. If the F-statistic falls between the lower and upper bounds, this means that the result is inconclusive. It cannot be decided whether there is co-integration. If there is co-integration among the variables (economic growth, economic growth 2, child abuse, inflation, and unemployment), then the next step of the ARDL approach can be performed with a lag selection. The selection is based on the Akaike Information Criterion (AIC). After that, the ARDL model as follows can be estimated.

$$\ln CA_t = \alpha_0 + \sum_{i=1}^{p} \beta_1 \ln CA_{t-i} + \sum_{i=1}^{p} \beta_2 \ln GDP_{t-i} + \sum_{i=1}^{p} \beta_3 2\ln GDP_{t-i} + \sum_{i=1}^{p} \beta_4 \ln CPI_{t-i} + \sum_{i=1}^{p} \beta_5 \ln UN_{t-i} + \varepsilon_t \quad (6)$$

Next is to estimate the short-run effects of economic growth, inflation, and unemployment on child abuse in Malaysia. Therefore, the ECM model to be estimated is as follows:

$$\Delta \ln CA_t = + \sum_{i=1}^{p} \emptyset_1 \ln CA_{t-i} + \sum_{i=1}^{p} \emptyset_2 \ln GDP_{t-i} + \sum_{i=1}^{p} \emptyset_3 2\ln GDP_{t-i} + \sum_{i=1}^{p} \emptyset_4 \ln CPI_{t-i} + \sum_{i=1}^{p} \emptyset_5 \ln UN_{t-i} + \emptyset_6 ECT_{t-i} + \varepsilon_t \quad (7)$$

Where $\emptyset_1$ to $\emptyset_5$ are the short-term dynamic coefficients, and $\emptyset_6$ is the coefficient of the speed of adjustment to the long-run equilibrium.

4. Findings

This part discusses the results of several tests, namely unit root, co-integration, ARDL, diagnostic, CUSUM and CUSUM square tests. The results of the descriptive test are reported in Table 4. The table shows descriptive statistics on the selected variables, namely inflation, economic growth, economic growth 2, unemployment and child abuse. Economic growth shows the highest mean while inflation has the lowest mean. Economic growth also has the highest maximum value compared to the other variables. Economic growth 2 has the lowest maximum value, standing at 3.0609.

Table 4. Results of Descriptive Statistics

Mean	Inflation	Economic Growth	Economic Growth 2	Unemployment	Child Abuse
Mean	2.7276	10.1840	3.0135	3.5548	7.3597
Median	2.6625	10.1764	3.0132	3.4000	7.2356
Maximum	5.4408	10.6732	3.0609	7.2000	8.6192
Minimum	0.5833	9.5751	2.9523	2.4000	5.2523
Std. Dev.	1.2432	0.3006	0.0297	0.9007	0.8174
Skewness	0.4023	-0.2898	-0.3424	2.5785	-0.4866
Kurtosis	2.5487	2.2831	2.3223	10.5891	3.1133
Jarque-Bera	1.0993	1.0977	1.1991	108.7433	1.2397
Probability	0.5772	0.5776	0.5491	0.0000	0.5380
Sum	84.5571	315.7025	93.4196	110.2000	228.1511

Note: Child abuse is measured as the log of the number of child abuse cases, inflation as measured as the log of consumer price index (2010 = 100). Unemployment is measured as the log of the number of people in unemployment. Economic growth is measured as the log of GDP per capita and Economic growth 2 is measured as the log of GDP per capita to the second power.

Table 5 shows the results of the unit root test based on ADF. The tests were conducted for intercept and intercept with the trend. From the results, it can be learned that the ARDL approach can be used in this study. This is because the results depict a mixed order of integration. For intercept, Inflation and unemployment are stationary at the significance level of 1% in the level while economic growth, economic growth 2, and child abuse are not stationary at any significance levels. However, at the first difference, all of the variables are stationary at the significance level of 1%. For intercept with the trend at level, the results show that only inflation is stationary in the significance level of 1% while the other variables are not stationary at any significance levels. Nevertheless, in the first difference, all of the variables become stationary at various significance levels. Economic growth and economic growth 2 are significant at the significance level of 5% while the other variables are significant at the significance level of 1%.

Table 5. Results of Unit Root Test

	Intercept		Intercept and Trend	
Variable	Level	First Difference	Level	First Difference
Inflation	-4.6625***	-6.7867***	-5.2691***	-6.6643***
	(0.0008)	(0.0000)	(0.0009)	(0.0000)
Economic Growth	-1.6156	-3.9111***	-2.7055	-3.9878**
	(0.4625)	(0.0059)	(0.2415)	(0.0212)
Economic Growth 2	-1.8505	-3.8175***	-2.7658	-3.9456**
	(0.3500)	(0.0074)	(0.2198)	(0.0232)
Unemployment	-4.3060***	-4.7969***	-4.0470	-4.6371***
	(0.0021)	(0.0006)	(0.0182)	(0.0049)
Child Abuse	-2.4971	-5.8412***	-2.3129	-6.0588***
	(0.1265)	(0.0000)	(0.4129)	(0.0001)

Note: *** and ** are significant at 1% and 5% respectively. The values in parentheses are probability values. Child abuse is measured as the log of the number of child abuse cases, inflation as measured as the log of consumer price index (2010 = 100). Unemployment is measured as the log of the number of people in unemployment. Economic growth is measured as the log of GDP per capita and Economic growth 2 is measured as the log of GDP per capita to the second power.

Next, a co-integration test was conducted, and the results are reported in Table 6. This study employs the bound test approach. The results show that the F-statistic is 4.5615 which is higher than the upper bound value at the significance level of 5%. This suggests that there is a co-integrating relationship among the variables (economic growth, economic growth 2, inflation, child abuse and unemployment). If the F-statistic falls within the lower and upper bounds, the result is inconclusive. However, if the value falls below the lower bounds at any significance levels, this means that there are no co-integrating relationships among the variables. Then, a long-run estimation test can be performed to examine the impact of economic growth on child abuse in Malaysia.

Table 6: Results of Bound Test

F-statistic		
4.5615**		
Critical Value	Lower Bound	Upper Bound
10% significant level	2.45	3.52
5% significant level	2.86	4.01
1% significant level	3.74	5.06

Note: ** is significant at 5%

After determining the co-integrating relationship among the variables, then a long-run relationship can be estimated using the ARDL approach. The results of the long-run relationship are reported in Table 7. Lag 1 was selected in this study. From the table, it can be observed that economic growth can significantly affect child abuse in the long run as it is significant at 10%. The coefficient value is 38.8680. This suggests that a 1% increase in economic growth can lead to a rise of about 39% in child abuse in the long run. The results also show that the other variables are not significant. Thus, it can be inferred that economic growth 2, inflation and unemployment do not have any significant effect on child abuse in the long run.

Table 7: Estimated Long-Run Coefficients Using ARDL Approach

Variable	Coefficient	Std. Error	t-statistic	Prob.
Economic Growth	38.8680*	21.4118*	-1.8153*	0.0838*
Economic Growth 2	375.7614	220.9993	-1.7003	0.1038
Inflation	-0.0493	0.0978	-0.5040	0.6195
Unemployment	-0.0990	0.1578	-0.6270	0.5374
Constant	744.3409	448.5351	1.659493	0.1119

Note: * is significant at 10%. Child abuse is measured as the log of the number of child abuse cases, inflation as measured as the log of consumer price index (2010 = 100). Unemployment is measured as the log of the number of people in unemployment. Economic growth is measured as the log of GDP per capita and Economic growth 2 is measured as the log of GDP per capita to the second power.

Then, a short-run estimation test using the ARDL approach was carried, and the results are reported in Table 8. The value of ECT is negative and in the range of 0 to 1. It is also significant. This confirms the long-run relationship among the variables. Additionally, the model can converge to the long-run equilibrium quickly after a short-run shock. From the table also, it can be learned that higher economic growth can significantly affect child abuse. A 1% increase in economic growth can lead to about a 29% rise in child abuse cases. It is significant at the 5% significance level. This implies during this period the country focuses primarily on productivity. During this period households are generally busy working to the extent that they

are stressed and exhausted, and may find it difficult to strike a balance between work commitments and caring for their family. This may lead to child abuse. However, higher economic growth 2 can result in lower child abuse cases. This suggests that the abusive Kuznets curve hypothesis can be supported, that in the early stages higher economic growth can increase child abuse cases. In the final stages, higher economic growth can reduce child abuse cases. This may be because people adjust and develop strategies to manage their family and work. Another factor may be that in these stages, the country has an improvement in technology that can lead to reduced levels of stress at the workplace. The results also show that inflation can significantly affect child abuse in the short run. A 1% increase in inflation can cause child abuse to drop by 0.06%. This shows that a higher cost of living may lead to an increase in rates of poverty. Poverty can then result in heightened stress among a population, and as a result child may be more widely abused. Unemployment is found to have no significant effect on child abuse in Malaysia.

Table 8: Estimated Short-Run Coefficients Using ARDL Approach

Variable	Coefficient	Std. Error	t-statistic	Prob.
Economic Growth	28.8621**	13.0423**	2.2130**	0.0381**
Economic Growth 2	-244.0496*	131.6310*	-1.8540*	0.0778*
Inflation	0.0614*	0.0335*	1.8304*	0.0814*
Unemployment	0.2324	0.1610	1.4436	0.1636
ECT	-0.6499***	0.2057***	-3.1577***	0.0047***

Note: *** and ** are significant at 1% and 5% respectively. Child abuse is measured as the log of the number of child abuse cases, inflation as measured as the log of consumer price index (2010 = 100). Unemployment is measured as the log of the number of people in unemployment. Economic growth is measured as the log of GDP per capita and Economic growth 2 is measured as the log of GDP per capita to the second power.

To check whether the model is good, several diagnostic tests are conducted, such as serial correlation, stability, heteroscedasticity and Jarque-Bera. The results are reported in Table 9. The results of all of the diagnostic tests are not significant. Therefore, the null hypotheses are accepted, and thus the model does not suffer any issues. Hence, the findings of this study are reliable.

Table 9: Results of Diagnostic Tests

Test statistic	F-statistic	Probability
Serial Correlation	0.68	0.54
Ramsey RESET stability	4.58	0.05
Heteroscedasticity	1.13	0.38
Jarque-Bera	1.55	0.46

To examine the stability of the model, CUSUM and CUSUMQ tests were performed, and the results are illustrated in Figure 4. The alternative hypothesis states that if the graph plotted falls within the boundaries, it can be concluded that the model is stable. If the graph plotted falls outside the boundaries, the model is stable. However, the results for this study show that the alternative hypothesis is accepted. Thus, the model is stable.

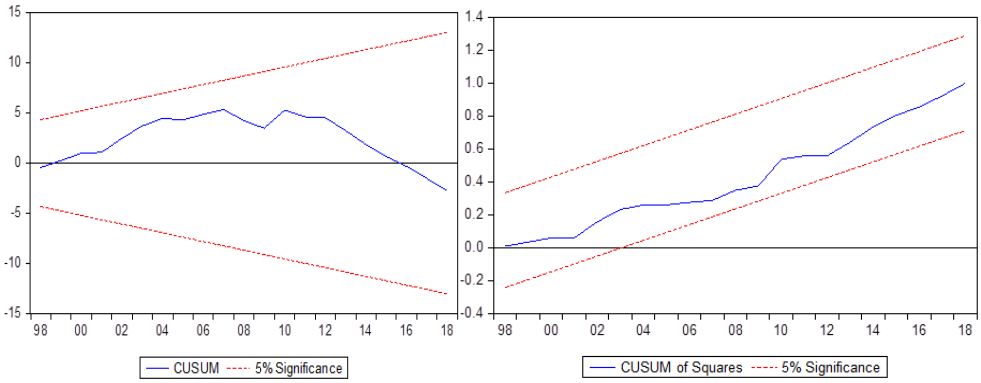

Figure 4: Results of CUSUM and CUSUMQ tests

CUSUM and CUSUMQ graphs are plotted to ensure that the model is consistent, and the results are shown in Figure 1. It can be seen that the plots fall within the boundaries based on Figure 1. This shows that it is stable in the model.

5. Conclusions

The issue of child abuse has been widely discussed of late, with the rapid rise in the number of incidences causing alarm. The situation necessitates government action on a society-wide level to mitigate a potentially profoundly damaging outcome in both the short and long term. For this reason, this study has been conducted to investigate the presence of the Kuznets curve of abuse in Malaysia, by employing the ARDL approach. Data ranging from 1988 to 2018 were collected and analyzed. The ARDL estimation reported both short-run and long-run regression between the number of child abuse cases as a dependent variable and GDP per capita, inflation, unemployment as independent variables. The outcomes are much more revealing in the short run as compared to the long run. In the long run, only economic growth shows a positive and significant impact on the number of child abuse cases in the country. Meanwhile, the results in the short run indicate the presence of the Kuznets curve of abuse in the country. Besides, inflation can also have a positive and significant influence on the number of child abuse cases in Malaysia. These findings are consistent with the findings of Shaari et al. (2015) and (2019). The unemployment rate did not significantly affect child abuse in either the long or short term. In the case of unemployment effects, these findings differ from those of Shaari et al. (2015).

Based on these outcomes, this research suggests several policy recommendations. The validation of the Kuznets curve of abuse may be a positive sign for the nation as rapid development in the country does not appear to cause a higher incidence of child abuse cases. With higher economic growth, the government may expect to generate a greater level of income. A part of this increased income could be utilized in the opening of a number of child-care centres in locations such as offices, which would benefit working parents who would be able to closely monitor their children. In terms of inflation, it would be advisable that the present government take appropriate measures to control inflation through contractionary fiscal and monetary policy. With lower inflation, this would result in a reduced financial burden for all groups within the country, with a particular benefit for those people from lower-income groups. This could be effective in realizing a reduction in the number of cases of abuse that are reported within lower-income groups, which occur, at least in part, due to the strain of financial difficulties.

Although this study has achieved its preliminary objective, it still has its limitations. A lack of data on some variables, such as divorce and poverty rates is one such limitation of this

study. Like other previous studies, especially on foreign workers, data on illegal foreign workers have not been included, meaning that a segment of the population goes undetected, and this limits to some degree the accuracy of results obtained. Similarly, this study cannot deal with unreported cases of child abuse. This might lead to some level of inaccuracy in the findings of this study. Nevertheless, this study aims to raise the issue for further investigations and discussions. Despite the likelihood of unreported child abuse cases, this study attempts to draw attention to an important issue and address a worrying trend. Additionally, data on child abuse from other countries are generally not easily available. Therefore, for future research, data on divorce and poverty rates should be included to produce more representative results and firmer conclusions. The scope of any future study can be expanded to include other countries, including the members of ASEAN. This expansion will facilitate our observation of the effects of economic growth on child abuse across a larger section of the globe.

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