The Relationship Among the Unemployment Rate, Inflation and Child Abuse Rate in Malaysia

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ABSTRACT

This paper attempts to shed some lights on the relationship among inflation, unemployment rate and child abuse rate in Malaysia by using data period of 1982 to 2011. This study employs ADF and PP test, Johansen co-integration test and causality test to seek for relationship among the variables. ADF and PP test show all variables are non- stationary in level and stationary in first difference. The Johansen co-integration test explains that the inflation rate and unemployment rate are correlated with the child abuse rate in the long run. The vector error correction model reveals an increase in unemployment rate causes the child abuse rate to increase in the short and long run. The causality test seems to run from the unemployment rate to child abuse rate. However, the findings show that no causality is found between the inflation rate and the child abuse rate. It is hope that the findings will assist Malaysian government to lessen the child abuse rate by controlling the unemployment rate at a minimum rate.

Keywords: Inflation rate, unemployment rate, child abuse rate.

1. INTRODUCTION

Over the past decades, the denial of children's right has been extensively discussed by researchers and policy makers all around the world. There are many different ways to deny the right of the children such as child abuse and negligence. It is aim of this paper to concern on child abuse that has been defined as a child who are below the age of 18 years old that intended or unintended by another party normally their parents, guardians or relatives who involve in emotional abuse, physical abuse, neglect and sexual abuse. Malaysian government considers child abuse as a serious offense and thus child abuse is put under disciplinary regulation act namely; Child Act 2001 and the Penal Code 1997. If the offender is found guilty, he or she may be accountable for a maximum fine of RM50, 000 and a prison term of 20 years, or both depending on the offence. Furthermore, the offender may also be whipped.

According to the Department of Social Welfare (Jabatan Kebajikan Masyarakat), it is about 1,999 cases of child abuse were reported in 2006 and 2,279 total cases of child abuse were stated in 2007 correspondingly. In 2008, the number of child abuse reports in Malaysia has increased to 2,780 cases. This figure includes 529

cases of incest, 952 cases of neglect, 863 cases of physical abuse, 58 cases of abandoned babies and 733 cases of sexual abuse. In Malaysia, Selangor becomes the state that experiences the highest records for child abuse cases since 2001 until 2008.

Year	Total Cases	Monthly Average
2005	2,236	186
2008	5,744	479
2009 (Jan-June)	2,193	313

Source: Jabatan Polis Diraja Malaysia

Figure 1: Child Abuse, Molestation and Rape Reported to the Royal Malaysian Police

Figure 1 shows the statistics data of child abuse, molestation and rape cases collected from Royal Malaysia Police Department (Jabatan Polis Diraja Malaysia) from year 2005, 2008 and 2009 (Jan-June). In 2005, there were 2,236 cases, it substantially increased to 5,744 cases in 2008 and 2,193 cases in a month of January until June 2009 for child abuse, molestation and rape cases. According to Royal Malaysia Police Department, the increasing number of child abuse, molestation and rape cases rapidly over the past few years shows that the cases in Malaysia are getting serious as it approximately at least ten thousand of children are reported as victims per year. According to Catherine and Kevin (2002), increasing number of child abuse cases is a worrying situation because it has led to an erosion of the family institution and country. Apparently the children today are the future generation for the country and they must be nourished to the maximum level by providing a safe and favourable surrounding area (Mariatul, 2010).

There are many factors that contribute to cases of child abuse such as family matters, poverty, pressure, homelessness, community and social violence, lack of quality parenting time, stress and unemployment. Child abuse is related to family problem such as poverty (Crittenden, 1999; Nelson, et al., 1993). According to Grzywacs et al., (2004); Almeida et al., (2005;) Gallo et al., (2006), the stress faced by the parents living in insufficiency is more destructive and lead to the child abuse compared to those who live in the house environment with a better income; it indirectly affects both parents and children physically and mentally. Their observation found that 87.5 per cent respondents chose financial problems as a main factor to commit the child abuse because they are not working and just depending on the spouse's insufficient of income. Most of empirical studies explained the factor of poverty or level of income contributing to an increased number of child abuse rate. Having income loss due to being unemployed is a root to these problems. As supported by Stuckler et al. (2011), stated that an increase in unemployment can cause alcoholism and suicide to increase. Schmitz (2011) estimated the effects of unemployment on health. However the study

mentioned that there is no relationship between unemployment and health. The findings are different from Adam et al (2003) who found strong negative linkage between unemployment and health or health and low income. Tang, (2009) studied the linkage among the unemployment rate, inflation and crime rate in Malaysia and the results revealed that the crime rate is dependent on the unemployment rate.

There are a limited number of studies which investigated the effects of unemployment on the child abuse rate. Nguyen, (2013) however found there is no relationship between the unemployment and child abuse. In fact, recession can be one of the factors influencing child abuse; Workers are laid off; the unavailability of jobs put much pressure on the unemployed people and they will vent their stress on their children. Katherine, et.al., (2010) believed that the 1990-1991 and 2001 recession period has contributed to considerable increases in case of child abuse. It is almost two time increase in abusive head trauma since the recession prevailed which suggesting that child abuse increased subsequent to the occurrence of increase in the unemployment rate. According to the 1975 National Family Violence Survey, families that suffer from unemployment have a rate of child abuse that were significantly higher those in which the husband was working full time. In addition, house environment with low economic status is often linked with stress. To the best of our knowledge, this present study is the first to examine the relationship between the relationship between unemployment, inflation and the child abuse in Malaysia by using the times series data approach. Plus, this paper aims to provide some insightful decision making to Malaysian government in tackling the child abuse problem in Malaysia.

2. LITERATURE REVIEWS

Researchers have been interested to ascertain the economic factors contributing to the child abuse. Various economic factors such as poverty, unemployment rate and inflation have been found to be connected with a rise in child abuse. Several past studies have addressed the issue of the relationship between poverty and child maltreatment (Weissman et al., 2003; Cancian et al., 2008; Drake and Pandey, 1996; Sedlak and Broadburst, 1996; Sedlak, et.al., 2010). While Gillham et al. (1998) and Drake et al., (2011) were concerned the relationship between child maltreatment and unemployment. Various methodologies have been proposed by various researchers and various nation.

Children are being exposed to many forms of abuse. Hence, Gillham et al (1998) was interested to determine the relationship between child physical abuse, child sexual abuse and child neglect and levels of female and male unemployment, single parent density and child poverty. A multiple correlational analysis was

employed and used archival data-registered cases of abuse and neglect and official data for social worker ratio, child population, single parent density, unemployment rates, means-tested clothing grants and free school meals for children. The results revealed that lower and more variables are found to be connected with female unemployment rates. Male unemployment rates were found to be related with total abuse and neglect rates in general. The same types of child maltreatment have also been applied by Sidebotham and Heron (2006) but the factor of neighbourhood poverty is the main focus in this study. The results found that the factor is positively related to all types of child maltreatment.

The relationship between childhood experiences of abuse and neglect and several indicators of socioeconomic well being in adulthood was carried out and found that increased rates of unemployment, poverty and Medicaid usage have long term impact of early victimization. Low socioeconomic status among parents has an impact on the maltreatment perpetration (Zielinski, 2009). The factor of unemployment is also discussed by another researcher such as Millett et al., (2011) who examined the influence of economic recession on child maltreatment rates. In the study, data on unemployment rates and labor force participation as economic factor as they are considered correlated with child abuse and neglect rates using state level data. Empirical growth plots and Ordinary Least Square (OLS) were employed and the findings disclose that a weak and inconsistent correlation between the factors and child maltreatment. This is different from the study by Family Resource Center Report that stated that for every 1% increase in unemployment causing child mistreatment one year later to also increase by at least 0.5% per 1000 children.

According to Weissman et al (2003) who analyzed the linkage between reported and substantiated rates of child abuse and the factors of demographic, health care resources and social services in rural are in the United States. Monthly data were obtained from 1984 to 1993. Univariate correlations and multivariate stagewise regression analysis were employed. The results revealed that rates of single parent families, divorce and elder abuse are significantly related to reported and substantiated child abuse rates and most economic factors such as unemployment rate and income level and health care system factors do not show any contribution to the reported or substantiated abuse rates in multivariate analysis. Family structure plays more important role in determining the child abuse rate as opposed to socioeconomic factors.

A study in 2008, over six million children was recorded as being at risk of child abuse in the United States. They addressed the factor of income contributing to the child abuse rate despite there are other factors such as poor parental mental health. The study exploited a random assignment experiment comprising various levels of incomes to find out the impact of the factor on the risk of maltreatment

among children. The study found the consistent evidence of an effect of the level of income on the child abuse rates (Cancian et al., 2008).

Emily and Sean (2011) analyzed by using analysis of variance and used state level data from 2006-2008 to examine the social context in which child maltreatment fatalities and conduct a five year follow up the study that found media attention predicted child maltreatment fatalities legislation. The findings show that social factors are very important suggesting that poverty and region are the strongest determinant of child maltreatment fatalities.

Berger (2004) investigated the effects of income, family structure and public policies on several indicators of child maltreatment. The findings revealed that income and family structure has resulted in child maltreatment. The factor of income affects routine medical and dental care, the quality of care giving. Single parent families and families with a biological mother and non biological father, results in lower quality care giving than mother-father families. Nevertheless, single mother families with working mothers has a greater tendency to poor care giving. The results also suggests that higher welfare benefits and lower unemployment rates can save the children from being maltreated.

3. METHODOLOGY

3.1 Stationary Test

Stationary test is employed to determine the non-stationary property of each variable. All variables were tested in levels based on the Augmented Dickey-Fuller (ADF) Test. Consider the equation below:

$$\Delta Y_t = \beta_{1+} \beta_2 t_+ \delta Y_{t-1} + \alpha \sum_{i=1}^{p} \Delta Y_{t-1} + u_t \qquad (1)$$

where Y is the variable, Δ is t the time trend and the difference operator, t is the time trend, P is the number of lagged term and u is the white noise residual of zero mean and constant mean and constant variance. $(\alpha_1, \alpha_2, \beta_1, ... \beta_m)$ is a set of parameters to be estimated. If the stationary test is significant, the variable series is stationary and have no unit root. Thus, the null hypothesis will be rejected, but the alternative hypothesis will be accepted. However, if the stationary test is not significant, the variable series is non stationary and has a unit root; thus, null hypothesis will be accepted. The hypothesis for this study is as follows:

$$H_0: \delta = 0 \quad \text{(unit root/ non stationary)} \qquad (2)$$
$$H_1: \delta \neq 0 \quad \text{(no unit root/ stationary} \qquad (3)$$

The data from 1982 to 2011 were collected to determine the relationship among the unemployment rate, inflation and child abuse rate. Equation 4 expresses the estimating equation used in this study:

$$CAR_t = \beta_0 + \beta_1 UR_t + \beta_2 CPI_t + \varepsilon_t \qquad (4)$$

To obtain the best results, the equation must show all variables to determine the percentage of change in the dependent variable when the independent variable changes approximately by one percent.

$$CAR_t = \beta_0 + \beta_1 \ln UR_t + \beta_2 \ln CPI_t + \varepsilon_t$$
$$(5)$$

3.2 Figures in parenthesis are the critical values

Where:
Ln CPI is the log of consumer price index.
Ln UR is the log of unemployment rate
CAR is child abuse rate
All the data used where extracted from the Malaysian department of social welfare (2009; 2012) and the statistic of World Bank (2012).

3.3 Co-integration Test

This study employs Johansen Co-integration test to examine the long-run relationship among all variables. Consider the following levels of VAR, with X_t defined as the log of consumer price index, unemployment rate and child abuse rate.

$$X_t = c + \sum_{j=1}^{p} \Gamma_j \Delta X_{t-j} + \varepsilon_j$$
$$(6)$$

If the variables in X_t are I(1), the VAR in Eq. (6) is not stationary. If no co-integration exists, statistical inference is impossible by using the usual tests. Given this condition, the difference of the series should be determined and a first difference VAR of the form should be estimated

$$\Delta X_t = c + \sum_{j=1}^{p} \Gamma_j \Delta X_{t-j} + \varepsilon_j \qquad (7)$$

Integration vectors give rise to the stationary variable. If this is the case, the VAR in Eq. (7) can be written as

$$X_t = c + \sum_{j=1}^{p} \Gamma_j \Delta X_{t-j} + \prod X_{t-1} + \varepsilon_t \qquad (8)$$

In Eq. (8), ΙΙ is a rank *r* matrix that can be divided as

$$\Pi = \alpha\beta'$$
(9)

where α is a 3 × *r* loading matrix and β is a 3 × *r* matrix of co-integrating vectors, *r* being the number of co-integrating vectors. Following the Johansen procedure, the number of co-integrating vectors were tested by using the co-integrated VAR as in Eq. (8). The Vector Error Correction Model (VECM) includes the error correction model which is to examine dynamic behaviour of the model. The VECM explains the examined model is adjusting in each time period towards its long run equilibrium. It shows that the disequilibrium will converge to long run equilibrium state. The VECM is also to see the relationship between the variables in the short run.

3.4 Granger Causality Test

The Granger causality test is applied to examine the causal relationship between two variables. If the p values of the variable *Y* significantly contribute to forecast the value of another variable *X*, then *Y* has a Granger causal relationship with *X* and vice versa. The test is based on the equation below.

$$Y_i = \gamma_0 + \sum_{z=1}^{p} \gamma_z Y_{t-z} + \sum_{i=1}^{q} \lambda_i X_{t-1} + \mu_t$$
(10)
$$X_i = \varphi_0 + \sum_{z=1}^{p} \delta_z X_{t-z} + \sum_{i=1}^{q} \psi_i Y_{t-1} + \varepsilon_t$$
(11)

where Y_l and X_l are the tested variables, μ_t and ε_t are the error terms, and *t* is the time period *z* and *i* are the number of lags. The null hypothesis is $\lambda_i = \psi_i = 0$ for all *i*. In the alternative hypothesis that $\lambda_i \neq 0$ and $\psi_i \neq 0$ for at least some *i* if the coefficient λ_i are significant but ψ_i are not significant, then *X* is Granger causal to *Y*. However, if both coefficients are significant, then causality runs both ways.

4. FINDINGS

The empirical results of the study are discussed in this study. The annual data from 1982 to 2011 are used for all three variables namely CPI, unemployment rate and child abuse rate. Unit root test based on Augmented Dickey-Fuller (ADF) and Philips Perron (PP) test are conducted to measure the stationarity property of the time series data. Subsequently, Johansen Co-integration test is applied to examine the existence of a long run relationship among inflation, unemployment rate and child abuse rate. Vector error correction model is performed to confirm the impact of inflation and unemployment rate on child

abuse rate. Granger causality test is to see the direction of the relationship among the three variables.

Table 1: Unit Root Tests

Model	Variables	Intercept		Intercept +Trend	
		Level	First Difference	Level	First Difference
ADF	ln CPI	-0.274	-4.053*	-1.453	-43.963**
		(0.917)	(0.004)	(0.823)	(0.022)
	ln UR	-1.236	-3.612**	-2.172	-3.563**
		(0.645)	(0.012)	(0.486)	(0.052)
	CAR	-1.849	-5.540*	-1.926	-5.507*
		(0.3547)	(0.000)	(0.618)	(0.004)
PP	Ln CPI	-0.287	-4.079*	-1.779	-3.990**
		(0.915)	(0.017)	(0.689)	(0.021)
	Ln UR	-1.583	-3.474**	-2.417	-3.493**
		(0.478)	(0.017)	(0.364)	(0.051)
	CAR	-2.554	-5.588*	-2.771	-5.56*
		(0.107)	(0.000)	(0.212)	(0.000)

Note: *, ** and *** indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% significance level.

Table 1 shows the results of unit root test of ADF and PP test. The results indicate that all variables are non-stationary in levels and stationary in first differences for both of the tests. Thus, we can proceed to the long run co-integration analysis. With these findings, Johansen co-integration test can be implemented to examine the existence of a long run relationship.

Table 2: Co-integration tests

Rank	Max-Eigen Statistic	Critical value (Eigen) at 5%	Trace Statistic	Critical value (Trace) at 5%
r*= 0	26.885	21.132	35.145	29.797
r ≤ 1	8.158	14.265	8.260	15.495
r ≤ 2	0.102	3.841	0.102	3.842

Note: L.R test indicates three co-integrating equations at the 0.05 level

Before the Johansen co-integration test is carried out, Johansen co-integration procedure is run to determine the optimal lag structure for the vector auto-regression (VAR) system. The Akaike's Information Criterion (AIC) is used to select an appropriate lag structure. Lag two is the best and selected in this analysis. Table 2 shows the results of Johansen co-integration test. T-trace statistic value and Max-Eigen statistic value suggest that the null hypothesis of

no co-integration vector is rejected at 5% significant level. On the other hand, there is one co-integrating equation, suggesting that the long-run equilibrium relationship among the unemployment rate, inflation and child abuse rate do exist. After obtaining one co-integrating equation, VECM can be performed.

Table 3: Vector Error Correlation Model (VECM)

Dependent variable: Δ CAR

Variables			Δ ln CPI	Δ ln UR	
	Constant	ECT_{i-1}			
Coefficients			-462.539	147.239*	-6.192*
	-1.667*				

Dependent variables: Δ ln UR

Variables			Δ ln CPI	Δ CAR	
	Constant	ECT_{i-1}			
Coefficients			-2.099	-0.002	-0.047
	-0.246				

Dependent variables: Δ ln CPI

Variables			Δ ln UR	Δ CAR	
	Constant	ECT_{i-1}			
Coefficients			-0.020	-0.000	-0.030*
	-0.007				

*, ** and *** indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% significance level.

Table 7: Granger Causality based on VECM

Dependent variables	χ^2-statistics		
	ln UR CAR	ln CPI	
CAR	9.640773*	2.840271	-
Ln CPI 2.70988	3.7888	-	
Ln UR 2.8261	-	0.9538	

Note: The χ^2-statistics tests joint significance of the lagged values of the independent variable. The *, **, *** denote the significance at 1%, 5% and 10% level. The optimal lag orders (k) is 2 and was determined by using AIC

Table 3 indicates VECM test. The findings reveal that the value of lagged error-correction terms (ECT_{i-1}) is negative and statistically significant. Therefore, it can confirm that the long run relationship from co-integration test does exist and there is also a long run causality running from inflation and the unemployment rate to the child abuse rate in Malaysia. Furthermore, the results also suggest that inflation does not influence the child abuse rate. The unemployment rate is significant at 1%, implying that the child abuse rate is positively influenced by the unemployment rate. An increase in the unemployment rate can cause the child abuse rate to increase in the short and long run.

The Granger causality results are reported in table 7. The results show that unemployment rate does Granger cause child abuse rate with no feedback effect in Malaysia. Consumer price index does not have any influence on child abuse rate and vice versa. Thus, an increase in inflation will not increase child abuse rate in Malaysia. Inflation rate and the unemployment rate do not have any mutual relationship.

5. CONCLUSION

This paper is to examine the relationship among inflation rate, the unemployment rate and child abuse rate in Malaysia through co-integration and causality analysis. At first we perform ADF and PP test and all variables are non-stationary in level and stationary in first difference. The Johansen co-integrating test explains that the macroeconomic variables namely inflation and unemployment coalesced with the child abuse rate to achieve the steady state equilibrium in the long run. The vector error correction model confirms that there is an effect of inflation and the unemployment rate on the child abuse rate in the long run. The Granger causality test shows that the unemployment rate has an influence on the child abuse rate. A rise in the unemployment rate can cause an increase in the child abuse rate for the period of 1982 to 2011. This paper can help formulate policies to reduce the child abuse rate in Malaysia. The policymaker should control the unemployment rate as we are now aware that the unemployment rate can contribute to a child abuse case.

Although this study has achieved its aims, there were still inevitable constraints. Firstly, the study only used inflation rate and the unemployment rate as the influences on the child abuse rate. There are other appropriate variables that can be considered in this study such as cost of child abuse, cost of living, and poverty rate and women participation in labor force.

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