

Female Labour Force and Child Abuse in Malaysia Using ARDL Approach

(Tenaga Buruh Wanita dan Penderaan Kanak-Kanak di Malaysia Menggunakan Pendekatan ARDL)

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ABSTRACT

Economic growth plays an important role in determining the number of female labour force. As economic growth intensifies, the number of female labour force increases simultaneously. However, the rise in the number of female labour force can lead to an increase in the number of child abuse cases. Therefore, this study is essential to explore the relationship between female labour force and child abuse cases in Malaysia. This study employs the ARDL bound testing approach and the results show that a higher number of female labour force can contribute to a higher child abuse case in Malaysia. Therefore, policies on female labour force should be formulated to cushion its effects on child abuse cases.

Keywords: female labour force; child abuse; ARDL

ABSTRAK

Pertumbuhan ekonomi berperanan penting dalam menentukan jumlah penyertaan tenaga buruh wanita. Apabila pertumbuhan ekonomi semakin kukuh, bilangan buruh wanita akan juga turut bertambah pada masa yang sama. Namun begitu, pertambahan jumlah penyertaan tenaga buruh wanita boleh menyebabkan berlakunya peningkatan kepada bilangan kes penderaan kanak-kanak. Justeru itu, kajian ini adalah penting untuk mengkaji hubungan di antara penyertaan tenaga buruh wanita dengan kes penderaan kanak-kanak di Malaysia. Kajian ini menggunakan pendekatan ujian sempadan ARDL dan dapatan kajian menunjukkan bahawa penyertaan tenaga buruh wanita yang tinggi boleh menyumbang kepada peningkatan kes penderaan kanak-kanak di Malaysia. Oleh itu, dasar berkaitan dengan tenaga kerja wanita perlu dirangka bagi mengurangkan kesannya terhadap kes penderaan kanak-kanak.

Kata Kunci: tenaga buruh wanita; penderaan kanak-kanak; ARDL

INTRODUCTION

Recently, the participation of female in labour force has prevailed all over the world. The pattern of female involvement in the labour force has tremendously changed owing to the vast opportunities of attaining higher education especially in the 21st century. A better educational attainment has spurred them to a marketable workforce. However, regardless of their educational background, female still strive to be employed albeit with low payment so that they could keep pace with the rising cost of living. The role of female is as important as that of the male in the labour force. The notion that female should remain at home has gradually dismissed especially when there is a gigantic change in the economy. The latest development by former Prime Minister has launched the Women's Innovation Academy under Prime Minister's Department or known as MyWIN to encourage more

public listed companies to have women on their boards. It exemplifies a continuous support from the government to empower female and reducing gender disparity. Thus there has been rising in the number of families with both husband and wife working, namely dual-earner family or dual-income family. Falkenberg and Monachello (1990) concluded that an issue arises with dual-income family is not how to manage money but on how both spouses manage their family particularly the female, of whom need to juggle full-time career and multiple roles at home. Consequently, an increasing level of daily stress amongst working female may cause child abuse to occur if there is no support given by the family members mainly from their spouses.

As revealed by Malaysian Social Welfare Department statistics (2017), stated that in the five-year period (2012-2016), 2,419 cases were reported due to the negligence of parents. Many cases of negligent parents abandoning



their children are documented. Cases such as children left in cars unattended, children fell off while using escalator and buildings, or under-aged children being let to shop or went alone to the night market to buy essential items for their parents or adult are some of the examples that imply the negligence of parents. The definition of child abuse has been extensively debated by many researchers as there are various meanings for different professional fields. For example, Bromfield (2005), Trickett, and Flanzer (2006) discussed that medical terms focus the physical symptoms of a child rather than the abusive or neglectful behaviour of an offender, while legal and judicial explanations highlight those facets of parental behaviour and child symptomatology that provide the best evidence for a successful prosecution. Meanwhile, World Health Organization (2016) stated a broader definition that child abuse is a form of abuse and negligence that occur to children under 18 years of age. It includes all types of physical and/or emotional ill-treatment, sexual abuse, negligence and commercial or other exploitation, which result in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power. Exposure to intimate partner violence is also sometimes included as a form of child abuse.

A number of researchers have documented that economic growth has also acted as a catalyst for the prevalence of higher female participation in labour force. Numerous studies have found that economic growth is the catalyst for the increasing number of female labour force in the market (Mujahid et al. 2013; Lechman & Kaur 2015; Chapman 2015). In fact, the existence of a U-shape relationship has been evidenced in various countries. As economic growth hikes, the number of female labour force drops at the early stages, and it turns out to be higher at the following stages. Economists might not be aware of the consequences of the higher number of female labour force. In fact, they view it as a good move to supplement the household's income, ensuing economic growth (Clavet & Duclos 2011; Bhalla & Kaur 2011). They seem to disregard a potential problem that might loom on the horizon if there is a large number of female in the labour force. An epidemic of child abuse might occur due to the higher number of female labour force, thus perplexing researchers from social science fields.

Apart from that, several economists have realized that the higher unemployment rate can prompt inexorable crime rate epidemic leading to the proposal of several control policies (Imrohorglu et al. 2000; 2004; Muzafar Shah et al. 2015; Shaari et al. 2015). They agreed that, unemployment works with the crime rate in a reciprocal way. However, their studies do not consider how the involvement of female in the labour force could potentially influence the occurrence of child abuse. A profound understanding has been built in us that inevitable pressure exists at the workplace,

and female, as workers are not exempted from facing such pressure. Much body of literature in psychology pertaining to job stress, burn out, work climate, among other variables, and have evidenced the relationships between gender and stress at work. For some working mothers, rather than having ample time for themselves, their time is occupied with work, hence, find themselves hard to do a balancing act between career and family. Failure to deal with their stress may prompt employed female to commit maltreatment towards their own children. Female are vulnerable to stress and finally vent it on their children. Another perspective is when female is tied up working at the office, they will put their children under someone else control. Nowadays, many cases of child abuse are not perpetrated by their parents but nurserymen or maids.

In addition, a report by the Ministry of Family and Community Female's Development (2017) states that a total of 3,318 cases of child abuse with a household crisis and negligence of parents and guardians were reported from 2012 to 2016, in which has elevated the child abuse rate. The extensive reports evidenced in the literature suggest that child negligence is the most prevalent form of child abuse (Pillado et al. 2010). When it comes to addressing child abuse and neglect, we have been conditioned to believe that most perpetrators are men. However, it is unfortunate to know that in some cases, child abuse is also committed by female. To shed light on this issue, this paper is intended to examine the relationship between female labour force participation and child abuse in Malaysia.

LITERATURE REVIEW

The proliferation of literature on female labour in the workforce signifies the important role of female in the economy. However, for decades, many studies only evolved around the economic growth and its relationship with the female labour force, in which, the link between higher economic growth and higher number of female labour force is profound. This implies that the previous studies are apathetic about its consequence. There are a limited number of previous studies that investigated the relationship between female labour force and child abuse (Lindo et al. 2013; Paul 2014). In India, Paul (2014) found that female labour force causes girls' child abuse in the short and long runs. In California, Lindo et al. (2013) found that an increase in the number of unemployed women reduces the percentage of child abuse.

Due to a small number of previous studies investigating the impact of female labour force on child abuse, this study extends a review of literature on the relationship between female labour force and the economic growth in various countries using various econometric approaches. Several researchers employed panel data analysis using many sets of data from

numerous countries such as Luci (2009) (186 countries), Gaddis and Klasen (2012) (Eastern Asia, Southern Asia and the Middle East and North Africa), Tsuni (2013) (160 South Mediterranean countries), Chapman (2015) (20 Middle East and North Africa (MENA) countries).

Luci (2009) investigated the effects of economic growth on female participation in labour force across 186 countries. The study employed the panel OLS and GMM estimator to analyse data from 1965 to 2004 and the results supported the U-shape relationship between economic growth and the female labour force participation. This suggests that as economic growth increases, the number of female labour decreases at the early stages. However, at the final stages, the number of female labour increases as economic growth intensifies. Gaddis and Klasen (2012) extended Luci's work by investigating not only the relationships between female labour force and economic growth but also female employment and sectorial growth in various regions: Eastern Asia, Southern Asia, Middle East and North Africa. The study employed the same approach (panel OLS and GMM estimator). The findings also supported the U-shape relationship between female labour and economic growth. Other than that, the findings also show that an increase in a female labour can cause sectorial growth to rise simultaneously.

Studies focusing on the relationship between female labour force and economic growth have proliferated in South Mediterranean countries. Employing GEM model to analyse data from 1960 to 2008 from 160 South Mediterranean countries and some controlled variables such as education and fertility, Tsuni (2013) found the existence of a U-shape relationship between female labour and economic growth. In the same demeanor, Chapman (2015) endeavored an investigation on the existence of a U-shape relationship but in different countries (the Middle East and North Africa countries). A set of data from 1990 to 2012 were analysed employing numerous panel data analysis such as OLS, fixed effects and GMM. The findings supported the existence of a U-shape relationship between economic growth and female labour in MENA countries.

Several studies highlighted the relationship between economic growth and female labour in single countries using various methods. For example, Lahoti and Swaminathan (2013) employed dynamic panel analysis (fixed effects, OLS and GMM) to examine the relationship between economic growth and female labour from 1983 to 2010 in India. The study also supported the existence of a U-shape relationship between economic growth and female labour but in India.

Tansel (2002) used panel data analysis to examine the relationship in Turkey. The study was based on data from 67 provinces in Turkey. The study confirmed that there is a U-shape relationship between economic growth and female labour in Turkey. Dogan and Akyuz (2017) extended the study (Tansel 2002) on the relationship between economic growth and female labour in Turkey.

Dogan and Akyuz (2017) used time series data which is the ARDL approach to analyse quarterly data from 2000 to 2013. However, their findings are different as they found that there is a reverse U-shape relationship between economic growth and female labour. It implies that at the early stages, as economic growth escalates, the number of female labour will spike but at the final stages, as economic growth keeps soaring, the number of female labour will eventually fall.

Mujahid et al. (2013) and Saqib et al. (2016) also employed time series data analysis to examine the relationship between economic growth and female labour in a single country. For instance, Mujahid et al. (2013) employed Johansen co-integration and ECM to examine the relationship between economic growth and female labour in Pakistan. Data from 1980 to 2011 were analysed and the results found that there is a U-shape relationship between economic growth and female labour in Pakistan. Saqib et al. (2016) explored the relationship between economic growth and female employment at only one stage by employing OLS. Data ranging from 1999 to 2014 were analysed and the results show that as economic growth is boosted, female employment will increase simultaneously in Saudi Arabia.

METHODOLOGY

This study uses a time series data analysis to examine the effects of female labour force on child abuse in Malaysia. Data on the number of child abuse case, consumer price index and female labour force, from 1990 to 2014 are collected and analysed. The data on total cases of child abuse and neglect reported to Malaysian Department of Social Welfare according to types of abuse (abandoned, neglect, physical, emotional, incest, sexual and others). This study treats consumer price index as the controlled variable. This is because Tang (2009) found that CPI can influence a social problem, namely, crime rate. All the data used are extracted from the Malaysian Department of Social Welfare (2009; 2016) and the statistic of World Bank (2016). The ARDL bound testing approach is employed in this study and the model specification is as follows:

$$CA_t = \beta_0 + \beta_1 CPI_t + \beta_2 WLF_t + \varepsilon_t \quad (1)$$

The equation must be in the logarithm to produce best results and to have explanations on the relationship between dependent variable and independent variables in percentage. This is because the data for the three variables are measured differently. Female labour force and child abuse is measured by the number of people while the CPI is measured in the form of index. Hence, logarithm is the best way to get unbiased results. The new equation is as follows:

$$\ln CA_t = \beta_0 + \beta_1 \ln CPI_{1t} + \beta_2 \ln WLF_t + \varepsilon_t \quad (2)$$

whereas $\ln WLF_1$ is the log of female labour force, $\ln CPI$ is the log of consumer price index and $\ln CA$ is the log of the number of child abuse.

This study conducts a unit root test based on the Augmented Dickey Fuller (ADF). In the time series data analysis, the stationary test is important to see the stationarity of data whether there is a unit root or no unit root and thus, we consider the equation below:

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \alpha \sum_{i=1}^p \Delta Y_{t-i} + U_t \quad (3)$$

whereas α and δ are a set of parameters to be estimated. The hypothesis for this model is as follows:

$$H_0: \delta=0 \text{ (Has unit root/non-stationary)} \quad (4)$$

$$H_0: \delta \neq 0 \text{ (No unit root/stationary)} \quad (5)$$

If the results show that it is not significant ($\delta = 0$), it means that the null hypothesis is accepted. Therefore, it can be concluded that the data has a unit root are or non-stationary. However, if the results show that it is significant ($\delta \neq 0$), it implies that the alternative hypothesis is accepted. Therefore, it can be concluded that the data has no unit root or are stationary.

The ARDL model does not only include a current value but it also involves the previous value (lag). This approach can see long-run responses from dependent variables to changes in independent variables (Gujarati 2003). Pesaran and Shin (1999) are the ones who developed the ARDL co-integration method. This method has several advantages over the Johansen co-integration method. ARDL is a better method. One of the advantages is that this approach can be employed regardless of the order of integration whether data are purely I (0), purely I (1) or mixed order of integration. If our variables are all stationary at first difference, then both of the methods can be employed. However, if one or more of the variables is or are stationary at level while others are at first difference, thus the Johansen co-integration is not favourable.

Apart from that, this approach still can be applied despite having a small sample size of data compared to the Johansen co-integration approach which needs a large sample size of data. Another advantage of this ARDL approach is that it can produce unbiased estimation in the long run (Harris & Sollis 2003). Some combinations of tests carried out in the ARDL test include bound test, cointegration test, error correction model (ECM), diagnostic test, cumulative sum of recursive residual (CUSUM) and cumulative sum of square of recursive residuals (CUSUMSQ).

ARDL tests begin with a bound test. This test is to see a co-integration. If the value of F-statistic is higher the upper bound, it suggests that we can reject null hypothesis, suggesting that there is co-integrated relationship between the variables¹. If the results show that there is a co-integration, then we can proceed to estimate a long-run relationship. Long-run relationships between variables are important to see whether consumer

price index or female labour force or both can cause child abuse in the long run. Thus, the order of lag for the ARDL model can be chosen based on Akaike Information Criteria (AIC). The long-run ARDL estimation for this study is as follows:

$$\begin{aligned} \Delta \ln CA_t = & \beta_0 + \beta_1 \ln CA_{t-1} + \beta_2 \ln CPI_{t-1} + \\ & \beta_3 \ln WLF_{t-1} + \beta_{4,i} \sum_{i=1}^p CA + \\ & \beta_{5,i} \sum_{i=1}^{q1} \Delta \ln CPI_{t-1} + \beta_{6,i} \sum_{i=1}^{q2} \Delta \ln WLF_{t-i} + \\ & U_t \end{aligned} \quad (6)$$

where Δ is the first difference operator, equation (7) is an ARDL model known as a model ($p, q1, q2$). The Akaike Information Criterion (AIC) is used to select the lag and then, the error correction model (ECM) test is conducted to see the short-run relationship between independent variables with dependent variables. For a short-run relationship, it is important to see whether consumer price index or female labour force or both can cause child abuse in the short run. The equation can be written as follows:

$$\begin{aligned} \Delta \ln CA_t = & \mu + \sum_{i=1}^p \phi_1 \Delta \ln CA_{t-i} + \sum_{j=1}^{q1} \phi_1 \Delta \ln CPI_{t-j} + \\ & \sum_{k=1}^{q2} \gamma_{-1} \Delta \ln WLF_{t-k} + \theta_1 ECT_{t-1} + \varepsilon_t \end{aligned} \quad (7)$$

where ϕ, φ and λ are the coefficients for the short run while λ is the speed adjustment for the long run error correction.

Next, the diagnostic test is carried out to test the goodness of the model for equation (1). There are several diagnostic tests to be performed such as the LM (serial correlation), Ramsey's RESET, Jarque-Bera (normal distribution) and ARCH (heterokedasticity) tests. If the diagnostic results show insignificance, the model is good. Next, the CUSUM and CUSUMSQ tests can be conducted. These tests are used to confirm the stability of the model for equation (1). If the CUSUM and CUSUMSQ lines fall within the 5% significance line, suggesting that the model is stable.

RESULTS

Table 1 shows the descriptive statistics for all of the variables used in this study. It exhibits the maximum, minimum, mean and standard deviation for WLF, CPI and CA. Based on the table, the variation of each variable is of large difference. The variable of WLF shows the largest mean of 3,557,171 while CPI shows the lowest mean with 83.4494. The largest difference between maximum and minimum values are exhibited by WLF with the different value of 2,352,619. The smallest difference between maximum and minimum values are exhibited by CPI. The difference is recorded to be 53.7271.

The results of the unit root test are recorded in Table 2. The findings suggest that all variables are not significant at levels under intercept with and without trends. However, under intercept and at first difference, the results show that child abuse and CPI are significantly

TABLE 1. Descriptive statistics

	WLF	CPI	CA
Mean	3,557,171	83.4494	2,178.960
Median	3,564,198	83.0766	1,390.000
Maximum	4,798,702	110.5000	5,744.000
Minimum	2,446,083	56.7729	895.0000
Std. Dev.	743,822.7	15.7276	1,404.998
Skewness	0.076490	0.0184	1.018242
Kurtosis	1.715907	1.9437	2.750388
Jarque-Bera	1.741976	1.1638	4.384974
Probability	0.418538	0.5588	0.111639
Sum	88,929,268	2,086.2350	54,474.00

TABLE 2. Unit Root Test of Augmented Dickey-Fuller (ADF) with and without Trend

Variable	Intercept		Intercept and Trend	
	Level	First Difference	Level	First Difference
lnCA	-0.8913 (0.7732)	-6.2191* (0.0000)	-2.0183 (0.5624)	-6.1295* (0.0003)
lnWLF	-1.4659 (0.5332)	-3.5427** (0.0159)	-0.6182 (0.9682)	-3.7559** (0.0385)
lnCPI	-2.4782 (0.1329)	-4.0110* (0.0056)	-2.7170 (0.2389)	-4.3739** (0.0109)

Note: *, and ** indicate significance levels of 1% and 5%, respectively.

stationary at 1%, while female labour participation is significantly stationary at 5%. Other than that, female labour force and CPI are significantly stationary at 5% while only child abuse is significantly stationary at 1% at first difference under intercept with trend.

The bound test is performed before the test of the estimated long-run coefficient test. The findings are reported in Table 3. The F-statistic is 6.2990 and its value is higher than the critical value at 5% significance level. It is larger than the lower bound of 3.79 and upper bound of 4.85. The results show that the null hypothesis is rejected and there is a long-run co-integration between the variables. Subsequently, a long-run estimation test can be conducted to examine the effect of female labour force on child abuse in Malaysia.

TABLE 3. Bound Test

	F-statistic	
	6.2990**	
Critical value	Lower Bound	Upper Bound
1% significant level	5.15	6.36
2.5% significant level	4.41	5.52
5% significant level	3.79	4.85

Note: ** indicates a significance level of 5%.

TABLE 4. Estimated long run coefficients using the ARDL approach

Variable	Coefficient	Standard Error	Probability
lnCPI	-9.7781	6.1866	0.1305
lnWLF	12.0860**	5.7356**	0.0486**
C	-132.3711**	59.5674**	0.0386**

Notes: R-squared is 0.9182, and adjusted R-squared is 0.9010. ** indicates a significance level of 5%.

Table 4 shows the results for the long run coefficients using the ARDL approach. The findings show that the R-squared value is 0.9182 while the adjusted R-squared value is 0.9010. The findings also show that female labour force participation has a positive relationship with child abuse in the long run as it is significant at 5%. Therefore, an increase of 1% in female labour participation can cause child abuse to increase by 12.086% in the long run in Malaysia. CPI is found to have no connection with child abuse in the long run. This suggests that an increase in CPI does not have any effect on child abuse in the long run.

Next, Table 5 shows the results of the error correction (ECT) and the results of the effects of female labour force and CPI on child abuse in the short run using ARDL approach. The findings reveal that the value of the ECT is negative and significant at 5%. The coefficient value of ECT is -0.3635 and it suggests that the deviations from the long-run growth rate in child abuse are corrected by 36.35%. The results also show that there is a positive relationship between female labour participation and child abuse as it is significant at 5%. Hence, an increase of 1% in female labour participation can lead child abuse to increase by 4.3928% in Malaysia. CPI is also found to have an effect on child abuse in the short run as it is also significant at 5%. Therefore, an increase in CPI causes an increase of 9.9790% in child abuse in Malaysia.

TABLE 5. Estimated Short-run Coefficients Using the ARDL approach

Variable	Coefficient	Standard Error	Probability
C	-48.1122**	16.9774**	0.0106**
Δ lnCPI	9.9790**	3.5055**	0.0103**
Δ lnWLF	4.3928**	1.6493**	0.0153**
ECT	-0.3635*	0.1187*	0.0064*

Notes: *, and ** indicate significance levels of 1% and 5%, respectively.

The results of the diagnostic tests (Breusch-Godfrey Serial Correlation LM, Ramsey RESET stability and Heteroscedasticity) are reported in Table 6. The results show that the model does not suffer from any diagnostic problem and it can be inferred that the model is reliable to explain the effects of female labour force on child abuse in Malaysia.

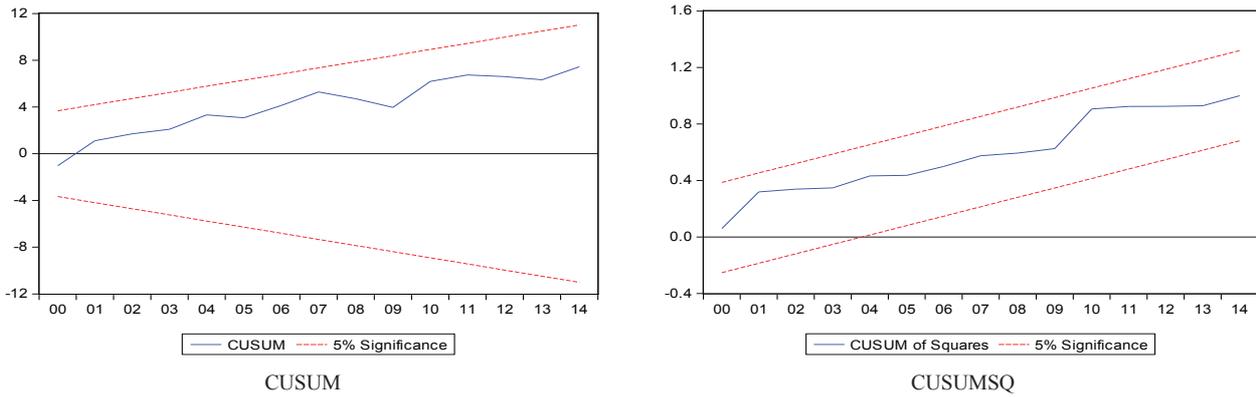


FIGURE 1. Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Square of Recursive Residuals (CUSUMSQ)

TABLE 6. Diagnostic tests

Test statistic	F-statistic	Probability
A: Breusch-Godfrey Serial Correlation LM	1.8953	0.1807
B: Ramsey RESET stability	0.8514	0.3684
C: Heteroscedasticity	2.7685	0.0573

We check the stability of the coefficient by using Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative of Squares of Recursive Residual (CUSUMSQ) tests. Figure 1 shows the results of the plots of the CUSUM and CUSUMSQ graphs. The plots are within the boundaries. This shows that the model is stable.

CONCLUSION

This study aims to examine the effects of having more female in the labour force on child abuse rate in Malaysia during the period 1990 to 2014. The unit root test was conducted which resulted in all the variables not stationary at levels but stationary at first differences. While, the bound test performed has revealed that there is ac-integrated relationship among the variables. The long- and short-run estimation tests found that the female labour force has undesirable effects on child abuse in the short and long runs. The findings also suggest that an increase in female labour force and inflation rate potentially resulted in a higher number of child abuse cases in Malaysia. Understanding this effect is vital because high inflation rate reduces families’ purchasing power as well as real income, regardless of having dual- income families. Prior studies suggested that income negatively associated with child abuse (Berger, 2004; Pelton, 2015; Raissian & Bullinger, 2017). Furthermore, multiple roles for working women and lack of spousal support lead to increased parental stress that causes child abuse and this finding is supported by Paul (2014).

Therefore, these findings are important to formulate policies for female workforce that could impede the

child abuse rate in Malaysia. It is necessary to offer a flexible working arrangement for female workers in order to alleviate their stress at work. This move can allow them to have adequate times with their children. Undeniably, high-pressure work environment can aggravate their stress at work and lead them to vent it on their children. Future research should attempt to further include the variable of male unemployed since many cases of child abuse in Malaysia reported male as a perpetrator.

NOTES

¹ If the value of F-statistic is lower than the lower bound, it means that the alternative hypothesis is rejected. Therefore, it can be concluded that there is no co-integrated relationship between the variables. If the F-statistic is within the lower and upper bounds, the results cannot be decided whether there is co-integration (Hussin & Muzafar 2008).

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