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# PERSONAL BANKRUPTCY IN MALAYSIA AND SINGAPORE: AN EMPIRICAL ANALYSIS

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## ABSTRACT

The main objective of this study is to examine the dynamic relationship between personal bankruptcy and Gross Domestic Product (GDP), Consumer Price Index (CPI), Interest Rate (IR), Household Debt (HD), and Unemployment (UE) in Malaysia and Singapore. This study covered time series annual data from 2000 to 2019. ARDL and Variance decompositions were used to test the model. The findings for Malaysia show that CPI and IR are negatively and significantly related to personal bankruptcy in the long run, while HD has a positive relationship. In contrast, CPI shows a positive impact while IR negatively impacts personal bankruptcy in the short run. However, for Singapore, CPI and HD have a negative and positive significant impact on personal bankruptcy, respectively, in the long run. On the other hand, CPI shows a positive and significant relationship with personal bankruptcy in the short run. HD has a positive and significant impact on bankruptcy for both countries. On the other hand, CPI and IR show different impacts on personal bankruptcy in Malaysia and Singapore. The difference in the impact of these macroeconomic variables on bankruptcy in Malaysia and Singapore implies that policies and regulatory reforms to managing personal bankruptcy should be country-specific against the backdrop of different economic environments.

**Keywords:** Personal bankruptcy, macroeconomic factors, credit cycle, long-run and short-run effect.

## INTRODUCTION

Until recently, the arcane arena of personal bankruptcy largely resisted the globalization pull in economics and law ( Dado, Hvolkova & Taborecka, 2021; Tabb & Ramsay, 2005). Global economic environments are rapidly changing the world's attitude towards debt and financial distress in relation to bankruptcy and insolvency laws and the upsurged availability of consumer credit around the globe (Martin, 2005). Evidence shows that part of the increase in personal bankruptcies is related to the liberalization of credit, which spurs

high consumer borrowings (Dick & Lehnert, 2010). The substantial increase in consumer debt has led to the increase in personal bankruptcies, creating pressure for government intervention through legal reforms to provide legislative relief.

The easy availability of consumer credit provides borrowers incentives to take higher debt than their prudent spending limit. According to Friedline et al. (2021), Lanning and Rose (2020), and the United Nations Report (2020), consumer indebtedness and personal bankruptcy increase due to an increase in consumer debt. On the one hand, there is debt sustainability and fast debt accumulation, but on the other hand, repayments are slow among households. The increasing number of personal bankruptcy is a major concern to developed countries, such as the United States of America (USA), the United Kingdom, Canada, and Singapore. It is also a concern to the emerging markets and developing economies (EMDEs), including Malaysia, Indonesia, China, the Philippines, Thailand, and South Korea, and low-income countries (LICs) (International Monetary Fund, 2018). The World Bank 2020 report states that EMDEs and LICs countries are financially unstable due to the countries' prevailing low level of national savings and high unemployment rate.

Additionally, another threat lurking on the horizon of the global economic landscape is the emergence of the current global pandemic COVID-19. The pandemic is impacting productivity growth, indebtedness, and the increased uncertainty inhibits investment and increases companies' closures. Due to the health crisis and increased uncertainty, countries are imposing lockdowns or movement control orders (MCO), causing a severe economic impact on the global supply chain and unemployment, potentially leading to more cases of bankruptcies.

Many countries believe that the approach to energizing their countries' economies and promoting economic growth and well-being is reforming a viable bankruptcy system. Kilborn (2005) quotes Germany and France as examples, where credit increases are linked to default increases, and bankruptcy law reforms are direct and explicit in these countries. Empirical evidence reveals that increases in consumer over-indebtedness lead to higher personal bankruptcies, negatively impacting the economy. The negative impact would expose the country to macroeconomic risks leading to the economic instability of the country (Muthitacharoen et al., 2015).

By definition, bankruptcy is the legal process and an instrument of distributive justice by which the debts of firms, individuals, corporations, and some local governments in financial distress are resolved (Li et al., 2014). Scales et al. (2001) state that bankruptcy is a treatment of a financial problem, and the default on the financial system is caused by different factors, among which is a country's economic activity (Chu, 2001).

Over the years, Malaysia and Singapore have experienced several bankruptcy legislative reforms. Malaysia and Singapore undertook legal reforms to the Malaysian Bankruptcy Act 1967 and the Singapore Bankruptcy Act (Amendment) Bill 2015 between 2000 to 2019. One notable observation is that the trend of personal bankruptcy in Malaysia and Singapore differed significantly during the period. For Malaysia, there was an upswing trajectory in the number of personal bankruptcies cases between 2000 to 2014, but it started to decline sharply from then onward until 2019 (refer to Figure 1).
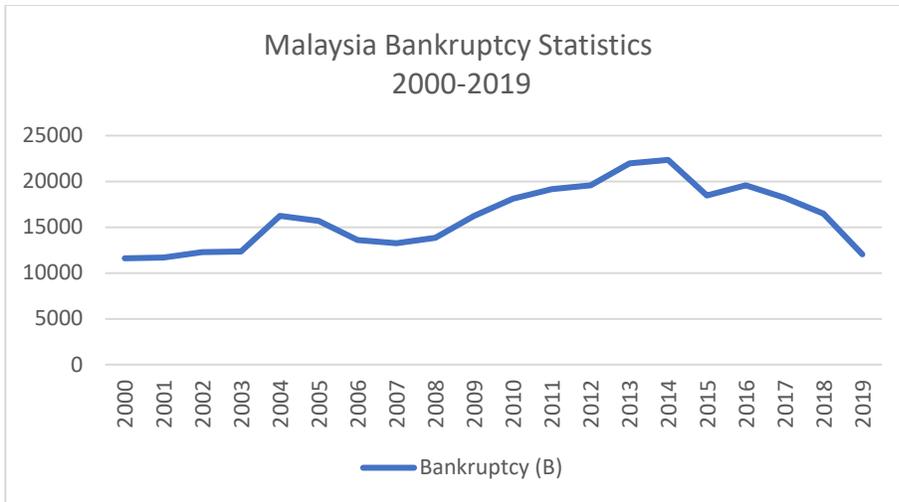
**Figure 1.** *Malaysia Bankruptcy Statistics 2000-2019*

On the other hand, Singapore's annual number of personal bankruptcy cases (Figure 2) recorded a declining direction as early as 2004 and declined steadily to 2019. During the period, the annual bankruptcy cases in Malaysia fluctuated between 11,000 cases and more than 22,000 cases. The bankruptcy cases registered a slight decline between 2005 to 2007. However, the number increased to 21,987 cases in 2013 and hit a high of over 22,351 cases in 2014. In 2015, there was a slight improvement as the number of bankruptcy cases decreased to 18,457. However, the cases increased to 19,588 in 2016. After that, the number of bankruptcy cases continued to decrease to 18,227 cases in 2017, 16,482 cases in 2018, and 12,051 cases in 2019. A possible reason for the lower number of bankruptcies from 2017 to 2019 could be that the Malaysian government had increased the minimum debt levels to RM50,000. Subsequently, the law was amended with the minimum amount being further increased to at least RM100,000 (Bankruptcy Act 2017) for bankruptcy proceeding. On the other hand, Singapore increased the bankruptcy threshold from SD10,000 to SD15,000 in the Bankruptcy (Amendment) Act 2015.
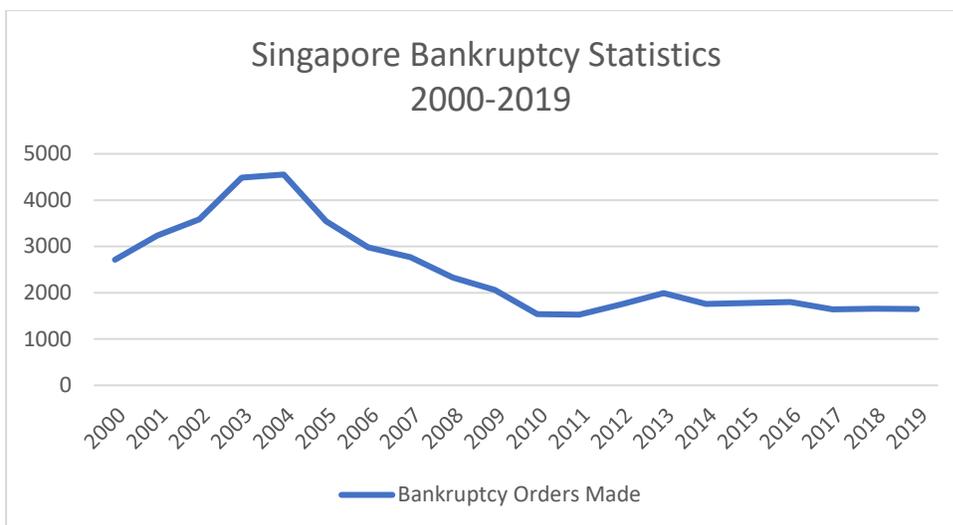


**Figure 2.** *Singapore Bankruptcy Statistics 2000-2019*

Because of the scarcity of literature and empirical research about bankruptcy, this study was stimulated to identify the factors influencing bankruptcies in different economies, such as an economically developed country like Singapore and an emerging market developing economy like Malaysia. Hence, the objective

of this paper is to investigate and compare the determinants of bankruptcies in Malaysia and Singapore and offer policy ramification recommendations to improve bankruptcy incidences. The investigation covers the influence of selected macroeconomic factors on bankruptcy cases during the 2000-2019 period. After reviewing the literature, we describe the methodology used in sections 2 and 3. The results are discussed in section 4, while section 5 concludes the paper by offering recommendations for future studies.

## LITERATURE REVIEW

The underpinning theories for this research are Life Cycle Hypothesis (LCH) and Theory of Household. LCH describes that an individual undergoes a cycle in life in terms of credit usage. He borrows and incurs debt when his income is insufficient to cover his consumptions and will service his debts when his income is high. However, credit defaults happen when the individual cannot meet his financial obligations, and he is declared bankrupt if his unpaid debt accumulates to RM100,000 based on the Bankruptcy Act 2017. Likewise, the Theory of Household emphasizes that a household, which may comprise one person or more, tends to incur larger consumptions in the early years as the family grows. As such, they are more likely to support their consumption with credits. Over consumptions and excess usage of credits pose them to credit defaults and bankruptcy.

The literature shows that different factors cause credit defaults in the financial system. Chu (2001) highlights economic activity and easy access to credits. Among the variables most associated with the occurrence of financial crises are related to the quality and the volume of credit granted and the level of interest rates (Schuh, 2019). Further, Dick and Lehnert (2007) provide evidence that credit liberalization contributes to personal bankruptcies.

Limited studies in recent times focus on personal bankruptcy. Macroeconomic factors, such as GDP, inflation, unemployment rate, interest rate, and household debts, give indicative outcomes in predicting bankruptcy. Desai (2017) and Schuh (2019) examined the link between personal bankruptcy and macroeconomic indicators (GDP, inflation, unemployment rate, interest rate, and household debts). Abaidoo (2018) found that inflation negatively impacted loan delinquency rates among US commercial banks in adverse macroeconomic conditions. The literature on macroeconomic variables focus on inflation (Acosta et al., 2009; Contreras et al., 2018; Croix & Liu, 2009), interest rates (Everett & Watson, 1998; Tomas, 2016), credit availability (Altman, 1983; Liu, 2004; Tomas, 2016), and GDP (Benito et al., 2009; Carling et al., 2007; Contreras, 2016; Everett & Watson, 1998; Hol, 2007; Ptak-chmielewska & Matuszyk, 2019; Tomas, 2016; Santoro & Gaffeo, 2009). The literature also indicates the relationship between household debt (HD) and bankruptcy (Abid & Zouari-ghorbel, 2012; Jappelli et al., 2013; Jureviciene et al., 2016; Lai et al., 2017; Ma'in et al., 2016; Meng et al., 2013; Meniago, Petersen, & P. Mongale, 2013; Nizar & Abdul Karim, 2016; Rahman et al., 2014). Jureviciene, Taujanskaite, and Sukacevskyte (2016) showed that inflation, unemployment rate, and interest rate contributed to personal insolvency.

On the other hand, existing studies on macroeconomic determinants focus on Gross Domestic Product (GDP), Consumer Price Index (CPI), House Price Index (HPI), interest rate, personal disposable income, and unemployment (Catherine et al., 2016; MD Sahiq, 2021; Mainal et al., 2014; Ma'in, Tajuddin, & Nathan, 2016; Rahman & Masih, 2014). Jappelli, Pagano, and Di Maggio (2013) show a positive relationship between macroeconomic variables and bankruptcy; that is, higher default rates imply greater financial fragility in the USA, the UK, and Germany between 1994 and 2001. Ramsay et al. (2017), and Bourova et al. (2019), identified 261% increase among the middle-class group in the number of personal insolvencies in Australia between 1990 and 2008 due to income and property ownership. Schechtman and Piazza (2012) demonstrated negative relationships between credit risk, GDP, and credit volume and positive relationships between the level of credit, unemployment, inflation, and credit risk. Allen et al. (2012) showed that the Canadian indebtedness increased to 150% from 110% since 1999 due to shocks to personal disposable income that led to insolvency.

Based on the above reviews, this study tests the following hypotheses:

$H_{a1}$:    *There is a significant relationship between GDP and Bankruptcy.*
$H_{a2}$:    *There is a significant relationship between Household Debt and Bankruptcy.*
$H_{a3}$:    *There is a significant relationship between Interest Rate and Bankruptcy.*
$H_{a4}$:    *There is a significant relationship between Consumer Price Index and Bankruptcy.*
$H_{a5}$:    *There is a significant relationship between Unemployment and Bankruptcy.*

## METHODOLOGY

### Model Specification
The literature shows limited studies measuring the impact of macroeconomic variables on personal bankruptcy in Malaysia and Singapore. Motivated by this gap, this study applies macroeconomic factors of two neighbouring countries with different economic developments to identify the determinants of personal bankruptcy. The model is specified below.

$$B_t = f(GDP_t + CPI_t + HD_t + IR_t + UE_t) \tag{1}$$

The error term $(\mathcal{E}_t)$ is included to function (1) as follows:

$$B_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 CPI_t + \alpha_3 HD_t + \alpha_4 IR_t + \alpha_5 UE_t + \mathcal{E}_t \tag{2}$$

where $\alpha_0$ is the constant term, and $\alpha_1$, $\alpha_2$, $\alpha_3$, $\alpha_4$ and $\alpha_5$ are the coefficients of the macroeconomic variables (GDP, CPI, HD, IR and UE).

### Data and Definition of Variables
This study used annual time series data of (B), (GDP), (CPI), (HD), (IR), and (UE) between the years 2000 and 2019 for Malaysia and Singapore. Table 1 shows the definition of the variables used in this study and their sources.

Table 1
*Definition of Variables*

| Factors | Variables | Variables Quantification/ proxy | Source of data Malaysia | Source of data Singapore |
|---|---|---|---|---|
| Dependent Variable | Personal Bankructy (B) | No. Personal Bankruptcy<br>Adult Population | BHEUU | info@singstat.gov.sg |
| Macroeconomic Factors | Gross Domestic Products (GDP)% growth | GDP = % growth of total market value of goods and services produced in a nation during a particular period | (MSD) | |
| | Consumer price index (CPI) | CPI is used as a proxy of inflation. Measured by year-on-year change of the CPI index | (MSD) | |
| | Unemployment (UE) | No. Unemployed<br>No. Employed<br>(%) in Labour force | (MSD) | |

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|  | Interest rate | Average lending rates | BNM Monthly statistical bulletin |
|---|---|---|---|
|  | Household Debt | Household Debt % of GDP. Credit consumption = household debts | (MSD) |

Sources: Bahagian Hal Ehwal Undang-Undang (BHEUU), Prime Minister Department, Malaysian    Statistics Department (MSD), Singapore Statistics Department (singstat.gov.sg)

## Analysis Technique

This study used descriptive statistics, ARDL, and variance decomposition (VDC). The sequence of the analytical technique of this study was as follows: the first step involved confirming whether the variables are stationary through the Augmented Dickey-Fuller (ADF) and the Phillips–Perron (PP) unit root tests. The second was the application of the ARDL bounds co-integration technique to examine the long-run relationship between macroeconomic variables and bankruptcy in Malaysia and Singapore. The ARDL bounds co-integration technique was used since it allows mixed order variables compared to the conventional co-integration techniques (Pesaran et al., 2001), but it does not accept I(2) or high-order variables (Ozturk & Karagoz, 2012; Shahbaz & Islam, 2011).  Another reason was that its application is suitable to small and finite samples (Pattichis, 1999).

ARDL Model:

$$\Delta B_t = \alpha_0 + \sum_{j=1}^{k1} \alpha_1 \Delta B_{t-j} + \sum_{j=0}^{k2} \alpha_2 \Delta GDP_{t-j} + \sum_{j=0}^{k3} \alpha_3 \Delta CPI_{t-j} \tag{3}$$
$$+ \sum_{j=0}^{k4} \alpha_4 \Delta HD_{t-j} + \sum_{j=0}^{k5} \alpha_5 \Delta UE_{t-j} + \sum_{j=0}^{k6} \alpha_6 \Delta IR_{t-j}$$
$$+ \beta_1 B_{t-1} + \beta_2 GDP_{t-1} + \beta_3 CPI_{t-1} + \beta_4 HD_{t-1} + \beta_5 UE_{t-1} + \beta_6 IR_{t-1} + \beta_7 ect_{t-1} + \varepsilon_t$$

where B represents the dependent variable of personal bankruptcy. Gross Domestic Products (GDP), Consumer Price Index (CPI), Household Debts (HD), Interest Rate (IR), and Unemployment (UE) are the independent variables, while $ect_{t-1}$ and $\varepsilon_t$ are the error correction term and the error terms, respectively. The regressions residual error is the error term and the period of time series t = 1…n; T.

The long-run relationship between the variables presents substitute critical values at individual level of significance (at the lower bound critical value I (0) and at the upper bound critical values I(1)) to test the long-run relationship between variables (Pesaran et al., 2001). The null hypothesis can be rejected when the F value exceeds the upper bound critical value (UBC), (F > UBC) and the variables are cointegrated.

## Variance Decomposition (VDC)

In the autoregression, VDC was applied to assist with the amount of information each variable provides to the other variables. VDC describes the amount of forecast of bankruptcy (B) variance of each of the variables by exogenous shocks to the other variables. VDC depicts the independent variable influence in describing the variability in the dependent variables over time. VDC has the ability to measure the default rate and probability of personal bankruptcy.

## Validity and Stability Test

For confirmation on the validity and stability of the estimated ARDL model, this study applied Breusch–Godfrey serial correlation LM test, heteroskedasticity ARCH test and Jarque–Bera normality test, the

cumulative sum of recursive residuals (CUSUM), and cumulative sum of square recursive residuals (CUSUMSQ) tests.

## RESULTS AND DISCUSSION

**Descriptive Statistics of Variables**
Table 2 and Table 3 highlight the descriptive statistics of the dependent variable, B and independent variables of five macroeconomic factors, namely GDP, CPI, IR, HD, and UE. The mean value of the dependent variable (B) is 0.132262 (13.23%) and 0.090348 (9.03%) for Malaysia and Singapore, respectively. The statistics indicate that the bankruptcy level is higher in Malaysia than Singapore. In contrast, the means for other variables are close. The mean for GDP shows the different levels of economic growth between the two countries during the study period.

Table 2
*Descriptive Statistics of Variables-Malaysia*

|  | Variables | Mean | Median | Maximum | Minimum | Std. Dev. |
|---|---|---|---|---|---|---|
| Model 1 | B | 0.132262 | 0.127495 | 0.157269 | 0.078837 | 0.019425 |
|  | GDP | 5.059646 | 5.361564 | 8.858868 | 1.513529 | 2.203683 |
|  | CPI | 99.75000 | 99.15000 | 121.5000 | 79.50000 | 13.99551 |
|  | IR | 6.467644 | 6.571667 | 6.885786 | 5.622500 | 0.338697 |
|  | HD | 73.89530 | 72.36800 | 88.95000 | 60.42000 | 10.13517 |
|  | UE | 3.305500 | 3.300000 | 3.700000 | 2.900000 | 0.219412 |

Table 3
*Descriptive Statistics of Variables-Singapore*

|  | Variables | Mean | Median | Maximum | Minimum | Std. Dev. |
|---|---|---|---|---|---|---|
| Model 4 | B | 0.090348 | 0.062883 | 0.194415 | 0.043975 | 0.052048 |
|  | GDP | 26.40545 | 26.43987 | 26.95290 | 25.80396 | 0.398987 |
|  | CPI | 100.0343 | 98.62694 | 114.0000 | 85.19913 | 11.95512 |
|  | IR | 5.360000 | 5.350000 | 5.800000 | 5.250000 | 0.110501 |
|  | HD | 73.54402 | 70.78600 | 91.99849 | 63.17200 | 9.371358 |
|  | UE | 3.245000 | 2.850000 | 4.500000 | 2.600000 | 0.735187 |

**Long-Run Results**
The variables' estimated long-run coefficients-Malaysia and Singapore are shown in Table 4. The result shows that HD positively affects bankruptcy (B) and is statistically significant at 5% in the case of Malaysia. The HD coefficient estimate shows that a 1% increase in HD increases B by 0.0017%. This reduction confirms the expected negative relation and proves that CPI contributes to the improvement of bankruptcy in Malaysia. Such a relationship suggests that CPI affects purchasing power, and consequently, the income of individuals. When income is adjusted for inflation, the increase in income could have been utilized by individuals to reduce their debts, preventing them from falling into a bankruptcy group.

Table 4
*ARDL Long Run Form-Malaysia and Singapore*

| | MALAYSIA | | SINGAPORE | |
|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Coefficient | t-Statistic |
| GDP | -0.001926 | -0.911039 | -0.001198 | -0.876504 |
| CPI | -0.00113** | -2.355674 | -0.0017*** | -3.282887 |
| IR | -0.04634** | -3.076101 | -0.129458 | -1.231123 |
| HD | 0.001721** | 2.755539 | 0.00365*** | 4.945222 |
| UE | -0.032600 | -1.708251 | 0.010983 | 1.456544 |
| C | 0.521201 | 4.003366 | 0.637648 | 1.147021 |

Notes: *, ** and *** denotes significance at 10%, 5% and 1% level respectively.

At a 5% significance level, IR negatively affects bankruptcy. The coefficient estimate indicates that a 1% increase in IR entails a reduction of - 0.04634% in the bankruptcy rate in Malaysia. This result suggests that when interest rate increases, it affects the borrowing rate to increase, making it difficult for loans to be approved for lower credit rating customers. Thus, bankruptcy cases tend to reduce as banks will only approve loans to borrowers with high creditworthiness.

In comparison to Malaysia, the result in Table 4 highlights some similarities and differences in the effects of the macroeconomic determinants on bankruptcy. Similar to Malaysia, CPI negatively influences bankruptcy in Singapore but at a 1%, whilst it is at a 5% significance level in Malaysia. The coefficient shows that an increase in CPI of 1% results in a reduction of - 0.0017% in the bankruptcy rate. This reduction confirms the importance of CPI contribution in improving bankruptcy in Singapore. HD positively affects bankruptcy. A 1% increase in HD increases B by 0.00365%. Similar to CPI, the result shows HD has a higher significance level to bankruptcy in Singapore than Malaysia.

Table 4 further reports a startling difference between Malaysia and Singapore results in terms of the effect of interest rate (IR). For Malaysia, interest rate has a negative and significant impact on bankruptcy. For Singapore, IR is negatively related but not a significant factor in influencing personal bankruptcy. UE has a negative impact on bankruptcy in Malaysia. In contrast, it has a negative impact in Singapore. However, UE is not a significant determinant of personal bankruptcy for two countries.

GDP and UE do not significantly affect bankruptcy in Malaysia and Singapore. The importance of income and the economic scenario on debtor's ability to pay off their debts is also confirmed by the negative relationship between bankruptcy and GDP. The result implies that an increase of 1% in GDP helps reduce bankruptcy by 0.001926 and 0.001198 in Malaysia and Singapore, respectively.

**Short-run Results**
$ECT_{t-1}$ is consistent with error-correcting behaviour when it is negative and statistically significant. The correction is hastened with a larger statistically significant coefficient within ECM (-1 to 0) values. Dampened fluctuations of the equilibrium path are precipitated by lagged error correction terms when the value is between -1 and -2 (Narayan, 2006). However, once this process is completed, convergence to the equilibrium path is rapid.

Table 5
*Dynamic ARDL Short Run Results-Malaysia & Singapore*

| | Malaysia | | Singapore | |
| Variable | Coefficient | t-Statistic | Coefficient | t-Statistic |
| --- | --- | --- | --- | --- |
| D(CPI) | 0.00633*** | 3.876814 | 0.003194** | 3.065135 |
| D(IR) | -0.0272*** | -3.681455 | -0.000386 | -0.694098 |
| ECT | -1.1169*** | -5.292155 | -0.774711 | -7.498638 |

Notes: *, ** and *** denotes significance at 10%, 5% and 1% level respectively.

In Table 5, the coefficient on $ECT_{t-1}$ is negative (-1.1169) and significant. The system reverts to equilibrium at a speed of 111% from the previous disequilibrium state. The negative sign indicates that the response variable of bankruptcy moves towards the long-run equilibrium path. In the short run, other variables are insignificant; only CPI and IR positively and negatively influence B at a 1% significance level for Malaysia.

The coefficient of the CPI variable indicates a positive relationship and reveals that the short-term imbalances are corrected with a speed of 0.633% per year. This means that bankruptcy reacts relatively fast to changes in CPI; that is, there is an expressive degree of sensitivity among these variables in the short term. The speed of this response can be attributed to purchasing power, whereby the increase in income could have been used to pay debts. In this case, it can be inferred that an increase in CPI denotes an increase in income, and this increase provides liquidity to borrowers to immediately settle their overdue loans. A similar reaction was obtained for the IR coefficient. The negative relationship expresses that imbalance in relation to its long-term values is corrected at a rate of 2.72% per year. Similarly, its short-term imbalances are also corrected with a rate of 2.72% in each period. As mentioned earlier, high CPI impairs economic stability, reducing the purchasing power of the population, and the results indicate that its effects are quickly perceived by borrowers. The same, however, does not occur for other variables, confirming the important finding of the effect of the increase in purchasing power and liquidity levels and the improvement in the economic scenario on bankruptcy.

In Table 5 for Singapore, the coefficient on $ECT_{t-1}$ is negative (-0.774711) and significant. The system reverts to equilibrium at a speed of 77.4% from the previous disequilibrium state. The negative sign indicates that the response of bankruptcy moves towards the long-run equilibrium path. In the short run, only CPI is positively affecting B at a 5% significance level, while other variables are insignificant.

The CPI coefficient indicates a positive relationship and reveals that the short-term imbalances are corrected with a speed of 0.3194% per year. This means that the bankruptcy rate reacts relatively fast to changes in CPI, indicating a degree of sensitivity among these variables in the short term. The speed of this response can be attributed to purchasing power, in which the increase could have been used by borrowers to pay debts.

**Stability Test**
Figure 3 shows the result of the stability test. The results show that the sums of the residues are within the critical range of 5%; there is no indication of instability over the period. CUSUM and CUSUMSQ tests show the bankruptcy series is stable. The series lies between 5% critical bound. The null hypothesis of parameters is stable.
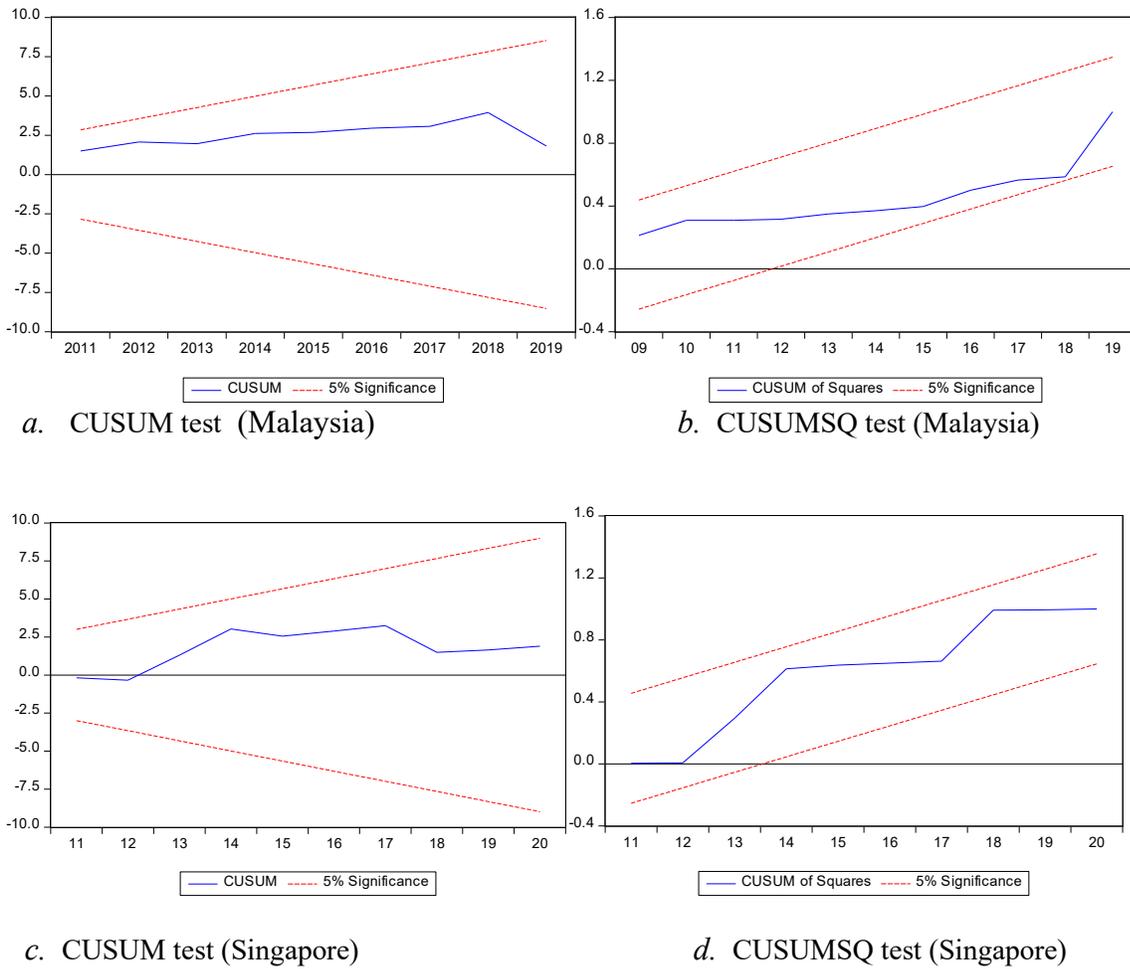
*a.* CUSUM test (Malaysia)

*b.* CUSUMSQ test (Malaysia)

*c.* CUSUM test (Singapore)

*d.* CUSUMSQ test (Singapore)

**Figure 3.** *CUSUM and CUSUMSQ Test*

**Variance Decomposition**

The results presented in Table 6 indicate that, in the initial period, the incidence of bankruptcy is fully explained by its own behaviour. As time goes by, there is a significant increase in the share of interest rate (IR), household debts (HD), unemployment (UE), gross domestic product (GDP), and consumer price index (CPI). What stands out is the representativeness of interest rate, which significantly increases its explanatory power over the period, from 4.1469% in the second period to 5.296% in the tenth period. Similarly, the household debts also raise its participation rate over time, initially explaining 3.062952% of bankruptcy in the second period and 4.56% in the tenth period. The share of unemployment is also significant and is broadly increasing to 4.14% in the tenth period. It can be observed that in the second period, GDP accounts for 3.34% of bankruptcy, but after the tenth period, it explains 3.54%. Similarly, in the second period, consumer price index (CPI) is at 0.717% of bankruptcy, but after the tenth period, it increases to 1.77%. At the tenth period horizon, IR and HD are the highest contributors of shocks to bankruptcy. UE contributes to 5.29%, 4.56%, and 4.14% variance or shocks to bankruptcy, respectively. The lowest shock in the variance is found in CPI at 1.7%. The reaction of bankruptcy in the face of shocks on the macroeconomic variables demonstrates greater elasticity, especially in relation to interest rate, household debts, unemployment, GDP and, to a lesser extent, CPI. Therefore, we conclude that the IR, HD,

and UE have a short-run relationship with bankruptcy (B). Hence, IR HD, and UE are affecting B in the short run.

Table 6
*Variance Decomposition - Malaysia*

| Period | SE. | B | GDP | UE | HD | IR | CPI |
|---|---|---|---|---|---|---|---|
| 1 | 0.018177 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.019631 | 85.75090 | 3.342652 | 2.981324 | 3.062952 | 4.146936 | 0.715232 |
| 3 | 0.020234 | 81.38464 | 3.468591 | 3.982190 | 4.372918 | 5.096193 | 1.695464 |
| 4 | 0.020320 | 80.96768 | 3.479558 | 4.132307 | 4.439682 | 5.296544 | 1.684232 |
| 5 | 0.020346 | 80.80060 | 3.520271 | 4.122253 | 4.529685 | 5.293937 | 1.733253 |
| 6 | 0.020356 | 80.71863 | 3.535269 | 4.141990 | 4.553853 | 5.291560 | 1.758702 |
| 7 | 0.020357 | 80.70936 | 3.535886 | 4.141598 | 4.554511 | 5.291412 | 1.767233 |
| 8 | 0.020359 | 80.69891 | 3.537768 | 4.141248 | 4.559111 | 5.295964 | 1.767001 |
| 9 | 0.020359 | 80.69435 | 3.538038 | 4.140991 | 4.561714 | 5.296636 | 1.768274 |
| 10 | 0.020359 | 80.69371 | 3.538012 | 4.141125 | 4.561880 | 5.296589 | 1.768685 |

Unlike Malaysia's results, Singapore's results presented in Table 7 show significant increases in the share of household debts (HD), Consumer Price Index (CPI), Gross Domestic Product (GDP), unemployment (UE), and interest rate (IR) over time. The representativeness of household debts (HD) stands out, significantly increasing its explanatory power over the period from 16.06% in the second period to 27.40% in the tenth period. Similarly, the consumer price index also raises its participation rate over time, initially explaining 4.96% of default errors in the second period and 7.32% in the tenth period. The share of gross domestic product is also significant and is broadly increasing to 7.036% in the tenth period. It can be observed that in the second period, unemployment accounts for 0.13% of default errors, but after the tenth period, it explains 3.55%. Similarly, in the second period, interest rate is at 0.00072% of default errors, but after the tenth period, it increases to 0.226%. This implies that HD, CPI, GDP, UE, and IR are affecting bankruptcy in the short run. Hence, this study incorporates the variables in the relationship with bankruptcy in the Variance Decomposition (VDC) test as highlighted above.

Table 7
*Variance Decomposition-Singapore*

| Period | SE. | B | GDP | UE | HD | IR | CPI |
|---|---|---|---|---|---|---|---|
| 1 | 0.014768 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.018901 | 74.12613 | 4.699874 | 0.135767 | 16.06878 | 0.000724 | 4.968730 |
| 3 | 0.020854 | 61.08683 | 7.593394 | 0.520212 | 26.67709 | 0.006973 | 4.115501 |
| 4 | 0.021818 | 56.25891 | 7.037116 | 2.480931 | 28.27105 | 0.133195 | 5.818799 |
| 5 | 0.022320 | 54.73208 | 6.986177 | 3.481559 | 27.64282 | 0.221666 | 6.935691 |
| 6 | 0.022415 | 54.53734 | 7.010440 | 3.509158 | 27.44072 | 0.224469 | 7.277868 |
| 7 | 0.022433 | 54.46759 | 7.028464 | 3.547841 | 27.40137 | 0.226214 | 7.328524 |
| 8 | 0.022435 | 54.45840 | 7.036598 | 3.548765 | 27.40203 | 0.226348 | 7.327861 |
| 9 | 0.022436 | 54.45466 | 7.036112 | 3.553175 | 27.40096 | 0.226653 | 7.328432 |
| 10 | 0.022436 | 54.45456 | 7.036229 | 3.553136 | 27.40051 | 0.226660 | 7.328902 |

Overall, this study supports both the Life Cycle Hypothesis and the Theory of Household. The Theory of Household states that there is a rationale for a household to use a bank's credit (HD) when the household income stream may not be consistent with his consumption pattern over time. In his early earning years, the households tend to borrow against his future income to purchase and accumulate assets and repay debts as his income increases. An increase in interest rate, coupled with the household consumption exceeding earnings and weakness in debt sustainability, i.e., failure to meet repayment obligations, leads the individual to insolvency and personal bankruptcy. Additionally, the findings of this study are consistent with Alfaro and Gallardo's (2012) study on household debt in Chile, where income and income-related variables are significant, and the probability of default and bankruptcy will rise as the household income decreases.

## CONCLUSION

This paper investigates factors affecting personal bankruptcy, an area in finance and banking that is gaining attention but not well-researched. The ease of bank credits is claimed to motivate individuals to take debts beyond their repayment ability, driving many of them to bankruptcy. In addition, past studies found economic activity to be significantly related to bankruptcy. We, thus, tested selected economic variables, namely GDP, unemployment, household debt, interest rate, and consumer price index on personal bankruptcy in two countries of different economic developments. These countries are Malaysia, a developing country, and Singapore, a developed economy. We found an opposite trend based on personal bankruptcy cases alone over a 20-year period (2000-2019). While bankruptcy cases in Malaysia were fluctuating, the number of bankruptcies was decreasing at a steady rate in Singapore. We further found some similarities and differences in the influence of macroeconomic factors on bankruptcy in the two countries in the long and short run. Household debt has a positive and significant influence on bankruptcy, while inflation (proxy by CPI) has a negative and significant impact on bankruptcy for Malaysia and Singapore. However, interest rate, a very significant factor in bankruptcy in Malaysia in the long and short run, is not significant for Singapore.

Due to limited studies on personal bankruptcy, we offer empirical findings on the personal bankruptcy determinants for Malaysia and Singapore. The findings have important policy implications. The difference in the impact of the macroeconomic variables on bankruptcy in Malaysia and Singapore implies that policies and regulatory reforms to managing personal bankruptcy should be country-specific against the backdrop of different economic and regulatory environments. This study faced some limitations in terms of the availability of bankruptcy data. With a wider scope of data on bankruptcy, either quarterly or yearly data, future investigations would be able to report the unique behaviour of the bankruptcy determinants. Future research is recommended to include multiple countries, comparing between developed countries, the emerging markets developing economies (EMDEs), and low-income countries (LICs). Researchers are suggested to extend this study by examining the application of the Permanent Income Hypothesis (Friedman, 1958) and a greater selection of both external and internal factors related to personal bankruptcy.

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