INTERNATIONAL JOURNAL OF BANKING AND FINANCE
https://e-journal.uum.edu.my/index.php/ijbf

How to cite this article:
Zaihan, F. A. D., & Tang, T. C. (2025). Do firm characteristics matter in explaining the lapse rate of life insurance policies and family Takaful certificates in Malaysia? *International Journal of Banking and Finance*, *20*(1), 84-104. https://doi.org/10.32890/ijbf2025.20.1.5

DO FIRM CHARACTERISTICS MATTER IN EXPLAINING THE LAPSE RATE OF LIFE INSURANCE POLICIES AND FAMILY TAKAFUL CERTIFICATES IN MALAYSIA?

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Received: 18/9/2024 Revised: 29/10/2024 Accepted: 11/11/2024 Published: 5/1/2025

ABSTRACT

This study discovers the influence of the firm's characteristics (i.e. firm size, firm leverage, aggressiveness of sales, board of directors' size and diversity) on the lapse rate of life insurance policies and family takaful certificates in Malaysia. The panel data includes 25 insurance operators consisting of 14 conventional insurers and 11 takaful operators available between 2014 and 2022.The cross-sectional Ordinary Least Square (OLS) estimates show that firm size has a negative influence on lapse rates of life insurance (2019-2021), while a positive sign for firm leverage (2017, 2020 and 2021). The aggressiveness of sales shows the inconsistent influence on the lapse rate of life insurance in 2017 (positive) and in 2021 (negative). The firm leverage negatively influences on the lapse rate of family takaful for 2017 and 2018. The panel data estimates show that firm leverage and diversity of the firm's board of directors significantly impact the life insurance lapse rate while only firm diversity significantly impacts family takaful lapse rates. This study offers policy implications for the insurance industry in Malaysia, especially by the Bank Negara Malaysia (BNM).

Keywords: Family takaful, firm characteristics, lapse rate, life insurance, Malaysia.

JEL classification: C30, G22.

INTRODUCTION

At any moment in time, individuals may face a risk of injury, illnes or even death. Indeed, businesses face different types of risk than individuals (i.e. fire, robbery, etc.), but there is no escaping risk in some circumstances. The insurance industry (market) emerged as a means of coping with uncertainties (risks) by transferring them from the individual or entity to the insurer. Historically, the first kind of insurance was maritime insurance, designed to secure ships and their cargo against the myriad uncertainties of trading and sailing through foreign seas. As insurance evolved and expanded, it now stands as a pillar of economic and social order (Ewald, 2019).

Note that the Act 1963 was one of the first legislative framework established in Malaysia aiming to oversee and organise the insurance industry for the post-independence period (i.e. since August 31, 1957). The insurance industry has experienced a rapid growth with the participation of local players (conventional insurers), such as the Malaysia National Insurance Berhad and Hong Leong Assurance, in the 1970s. It witnessed a shift towards greater local ownership in the industry, allowing the Bank Negara Malaysia (BNM, henceforth as a regulatory authority to supervise the development of insurance industry by strengthening its fundamental and ensuring that firms adhered to sound financial practices with sufficient capital reserves. The Islamic equivalent of insurance is named as takaful for muslims. Unlike conventional insurance, takaful is *Shariah*-compliant as it does not have elements of interest (*Riba*), uncertainty (*Gharar*) or gambling (*Maysir*) Islam prohibits those. The concept of takaful is rooted in the principle of mutual cooperation where a group of people agree to donate contributions to a pool of money which is managed by a takaful operator. The so-called participants agree to help (or reimburse) each other in cases of certain losses. The takaful operator gains a fee as the manager of the pool of funds, known as the '*Wakalah* fee', and earns a fixed portion of any investment return.

In 1982, a groundwork feasibility study was conducted to explore the possibility of establishing takaful operators in Malaysia (Ab Rahman et al., 2011). Syarikat Takaful Malaysia Sdn. Bhd. was incorporated in 1984, introducing Islamic insurance (i.e. takaful) into the Malaysian insurance industry. The Takaful Act 1984 was subsequently documented as a complement to the Insurance Act 1963. Henceforth, the Malaysian insurance industry comprises a dual sector, with both conventional insurance and takaful. Both acts were later replaced by the Insurance Act 1996, which introduced more comprehensive regulatory measures to enhance consumer protection, improve corporate governance and foster a more competitive market environment. In further liberalizing the Malaysia's financial markets, the Insurance Act 1996 was repealed and incorporated into the Financial Services Act 2013 and Islamic Financial Services Act 2013 providing the regulation and supervision of all financial institutions and Islamic financial institutions (i.e. banking, insurance, payment systems and others) respectively (BNM, n.d.).

As a small, open economy, Malaysia's insurance environment has witnessed the development of both conventional and takaful sectors. The market penetration for life insurance and family takaful increased to 42 percent[1] in 2020 from 33 percent in 2014 (see, BNM, 2019; 2022). The industry may remain relatively small by international standards. The Malaysia's total insurance penetration (i.e. a percentage of gross premiums and gross contributions out of GDP) is 5.0 percent in 2020 that is lower than of higher-income countries such as Singapore (10.9%), Korea (11.5%), Ireland (10.4%), United Kingdom (11.4%), and United States (12.5%), but it is higher than Indonesia (1.6%) and India (3.8% in 2019) (OECD, 2022). Since 2017, Malaysia has introduced '*Perlindungan Tenang Vouchers*', which allow low-income households to consider affordable insurance and takaful protection plans. It is an effort by

the government to increase awareness of the need for financial safety nets and increase insurance and takaful penetration rates nationwide.[2]

Both life insurance policies and family takaful certificates are often issued for long terms based on the protection required by the consumers. In Malaysia, the insurance industry typically protects against death and total permanent disability. However, it is the case of the insurance policy or takaful certificate to be prematurely terminated under certain circumstances. Such case is termed as the 'lapse' or 'surrender' of a policy or certificate, in which the latter is more commonly termed where the premature termination of policies (or certificates) involving a cash surrender value pay-out to the policyholder (or certificate holder) (Eling & Kisenbauer, 2014). A lapse in insurance policies and takaful certificates equates to an immediate loss of financial protection to the policyholder and their beneficiaries in the event of an adverse situation. It also deteriorates the financial stability of insurers and takaful operators (ITOs, hence after) by high upfront investments in acquiring new business for life insurance and family takaful in the first few years of issuance, due to costs related to marketing and distribution commissions (Kiesenbauer, 2012) foreseeing loss of future profits (see, Jiang, 2010). ITOs may be subject to liquidity risk if widespread surrender of policies occurs and they are obligated to pay large sums of surrender cash values simultaneously (Eling & Kisenbauer, 2014). Lapses may also pose a risk of mortality anti-selection if the policies and takaful certificates that lapse are likelier to be generally healthier than those that persist (Valdez et al., 2014). A high lapse rate represents potential financial losses for ITOs and their customers weakening the industry's effectiveness in managing and distributing risks over a long-term (OECD, 2021).

The lapse rate of life insurance policies is a variable that closely monitored by regulators globally (see International Association of Insurance Supervisors, 2022). The lapse rate provides regulators with how much business an insurer can retain and the quality of advice provided to customers at point of sale. The respective regulators and associations worldwide report experience studies on lapse rate (or persistency rate, an indirect measure of lapse rate), such as the Life Insurance Marketing and Research Association (LIMRA). Another example is the Society of Actuaries (SOA) joint study on US universal life insurance lapse rate for 2015-2021 providing inputs to US insurers to compare their own experience to the industry and make improvements accordingly (SOA, 2023). In Malaysia, insurance lapse experience is not directly reported by the respective authority(ies) but can be inferred from the insurance industry's persistency performance. Such figures are briefly reported in the Insurance Annual Report (by BNM) 2000-2005 and subsequently available in BNM's monthly highlights and statistics. In 2021, the Life Insurance Association of Malaysia (LIAM) reported that policyholders' persistency rate increased from 94.5 percent in 2019 to 95.6 percent in 2020, implying a proportionate reduction in lapse rate (PIDM, 2021). Meanwhile, the penetration rate of family takaful fell from 20.1 percent (of the number of certificates to total population) in 2022 to 19.8 percent in 2023 due to both lower new business growth and increased number of lapsed and terminated certificates (BNM, 2023). The global takaful sector remains small despite being almost five decades old, accounting for only 2 percent of global Islamic finance assets in 2023 (IRFF, 2023).

Undoubtedly, well-managed lapse rates contribute to global sustainability and resilience by ensuring old-age income security (and financial well-being among the elderly).[3] Increased demand for life protection and savings products should help close retirement savings gaps and improve household financial resilience against mortality risks (i.e. traditional life insurance and medical or long-term care insurance). These align with the needs of an ageing population and hence can help narrow retirement protection gaps and typically offer better margins than savings type policies [for China's insurers]

(Swiss Re Institute, 2024, p.19 & 25). Low lapse rates are expected to minimize the effects of longevity risk (i.e. the potential for living longer than anticipated and exhausting retirement savings) by regularly revising policyholders' strategies, and necessarily their financial plan as they age.[4] Again, insurance as a risk protection mechanism plays a vital role in nine of the SDGs (Sustainable Development Goals), namely, no poverty, reduced inequalities, zero hunger, good health and well-being, gender equality, decent work and economic growth, industry innovation and infrastructure, climate change and partnerships for goals.[5] The insurance industry plays a role in shaping responses to sustainability and climate change challenges. The demand for greater sustainability is here to stay. It presents significant upsides to the insurance industry by demonstrating their sustainability leadership and providing risk and protection solutions to support the world's transition to net zero. [6]To note that aging will stimulate innovation and the supply of new services and intelligent insurers will be at the forefront of realising the potential opportunities to provide healthy, secure and enjoyable retirements.[7] Malaysia does offer a case study to this concern as the country is at a critical juncture in its demographic shift towards an increasingly ageing population in which the Department of Statistics Malaysia (DOSM) projects a significant rise of citizens aged 65 and above from 8.1 percent in 2024 to 14.5 percent by 2040.[8]

Indeed, studies examining the determinants of insurance lapse rates offer~~ing~~ country-wise evidence. However, there needs to be more such study for a small open economy, Malaysia. The objective of this study is to estimate the relationships [associations] between basic firm-level characteristics (i.e. firm size, firm leverage, aggressiveness of sales, board size, and board diversity) and lapse rates of 25 ITOs in Malaysia between 2014 and 2022. Of them, 14 ITOs are conventional insurers and 11 of Takaful operators. This study is helpful to regulators for better informed policymaking in pursuit of financial market~~s~~ openness (See, Wai, et al. 2024). The structure of the study is organized as follows. Section 2 is a literature review. Section 3 describes the empirical framework, variables, data and testing methods - Ordinary Least Squares (OLS) estimator cross-sectional and panel data. Section 4 presents the empirical results (i.e. estimated equations). Section 5 concludes the study.

LITERATURE REVIEW

Studies on the lapse rates of the insurance industry have considered a long history for the UK and US (Shamsudin et al., 2022), including those by LIMRA and the American Institute of Actuaries, to support insurers' understanding of lapse rates and behaviour as it is crucially tied to insurers' profits (Carson and Dumm, 1999; Gatzert et al., 2009). Despite this, Malaysia's case remains relatively a few due to the lack of publicly available data on insurance policy persistency in the past decades. According to Srbinoski et al. (2019), the field that examines lapse behaviour of life insurance evolved from examining life insurance demand but has more dispersed findings, encompassing different environmental, policyholder and policy characteristics. Two clusters of studies have been classified, namely theoretical studies, and empirical studies on the lapse behaviour. The first generally focuses on examining how pricing and risk management of life insurance products differ based on embedded options (i.e. allowing the option for premature surrender) and assuming a rational value maximising policyholder (see, for example, Nordahl, 2008). The second - empirical studies that attempt to examine the macroeconomic determinants of the lapse rate of conventional insurance policies. Among them are unemployment rates, interest rates, and other macroeconomic variables. The empirical studies are also interested in testing the Emergency Fund Hypothesis (EFH), Interest Rate Hypothesis (IRH), and Policy Replacement Hypothesis (PRH) - as pillars of lapse policy studies (Shamsudin et al., 2022). For example, EFH is due to the policyholder's tendency to use a policy's cash value (i.e. received when the policy is surrendered

or terminated) as an emergency fund during economic hardship (Outreville, 1990). While IRH highlights the tendency for policyholders to take advantage of arbitrage opportunities at times of rising interest rates where retaining the policy would mean higher opportunity costs (Kuo et al. 2003). For PRH, policyholder tends to replace a current policy with a new one with better price and terms (Outreville, 1990).

For example, Asa (2010) found that both ERH and IRH are supported by data from the US life insurance industry (1951-2008) regarding their relationship between policy surrender, unemployment rate and interest rate. Similarly, Adams et al. (2020) consider Swedish life insurance industry panel data to confirm both ERH and IRH. Studies such as Fang and Kung (2012) and Gemmo and Götz (2016) focus on policy and policyholder characteristics (e.g. policyholder age, policy size, etc.) to support ERH. Gemmo and Götz (2016) consdier consider health, income or bequest motive shocks and discover that the type of emergency changes depending on the policyholder's age. Fier and Liebenberg (2013) examine the microeconomic characteristics by tracking U.S. households over 12-year to explore the importance of household changes that are related directly to a decision to lapse. They find that lapse behaviour may be influenced by large income shocks experienced by a household, life events (i.e. recent retirement and death of a spouse) and the policyholder's age. The study provides evidence of ERH and PRH.

Another studies are about the firm-specific characteristics of lapse rates for insurance policies. Kiesenbauer (2012), includes macroeconomic factors and company characteristics (i.e., company age, distribution focus, legal form, company size, and participation rate spread) of 133 German life insurers' lapse rates. The key driven of lapse rates are private spending, current yield, GDP, company age, distribution focus, and participation rate spread. Yu et al. (2019) studied the lapse rates of life insurance in China by adding companies' leverage, business concentration, and firm ownership structure. The study supports EFH, and the Chinese life insurance lapses are negatively associated with company age, and business concentration, while positively related to firm size, and leverage. A high lapse rate weakens an insurer's financial strength and stability by increasing leverage and decreasing in new business written. Adams et al. (2020) consider Swedish life insurers for 1915- 1947 and find a positive relation between firm size, load, and policy lapse rates. Using Korean data, Shim et al. (2021) include policyholders' individual, demographic, microeconomic and household characteristics to understand life insurance surrender rate. Tian and Dong (2024) examine the Chinese health insurance surrender at the firm level for 2011-2021. They find that a firm's asset-liability ratio has a positive effect, while value preservation, capital appreciation rate and research and development expenditure rate have a reversed effect.

In the context of Malaysia, there is a marked reduction in the pool of relevant lapse policy literature. Aziz and Razak (2019) focus on policyholder profiles (i.e. the customers of one insurance agent for 2010-2015) that are likely to terminate life insurance policies. The determinants include gender, salary range, marital status and age, but only marital status does affects the termination of insurance policies. Yaakob et al. (2018) advocate that lapses in family takaful certificates are due to demographic characteristics and policy features. The data of a Malaysian takaful operator support only the sum insured, payment method (i.e. whether cash or otherwise), and certificate holder's gender. A recent study by Chong et al. (2024) estimated and compared the efficiency of the Malaysian insurance industry both conventional insurance (46 providers) and takaful (28 providers) insurance (2013-2021). They find that scale efficiency has a significantly impacts the total efficiency more than pure technical efficiency. There is a substantial difference between the efficiencies of the Malaysian conventional insurance and

takaful insurance that the Shariah-compliant is a more conservative investment approach - it decreases the risk of losses and financial instability. Other studies (Ismail, 2013; Kantakji et al., 2020) look at the financial performance of conventional insurance or takaful operators in Malaysia.

In short, it remains to be seen whether firm-level characteristics such as size and leverage have similar impacts on Malaysia's insurance industry, which is shaped by both conventional and Islamic financial principles. The available studies (e.g., Aziz & Razak, 2019; Yaakob et al., 2018) need to address broader questions about the impact of firm characteristics on lapse rates. Aziz and Razak (2019) focus solely on individual profiles and ignore firm-level dynamics like board diversity. Similarly, Yaakob et al. (2018) look at 310 policyholders' demographic of a takaful operator in Malaysia. Chong et al. (2024) are about the efficiency of the Malaysian insurance industry. Regarding firm-level characteristics, the literature review touches on different findings from other countries, such as the positive relationship between firm size and lapse rates in China but the antagonistic relationship in Germany. For example, Yu et al. (2019) studied the lapse rates of life insurance in China. They found that Chinese life insurance lapses are negatively associated with company age and business concentration, while positively related to firm size (i.e. Kiesenbauer, 2012 for the Swedish life insurers) and leverage. Tian and Dong (2024) considers different firm-level variables (i.e. asset-liability ratio, R&D expenditure rate, value and appreciation rate of capital and foreign-funded group company) with other findings. Hence, these differences generate a need for further investigation with the common firm-level characteristics, especially for a small open economy, Malaysia.

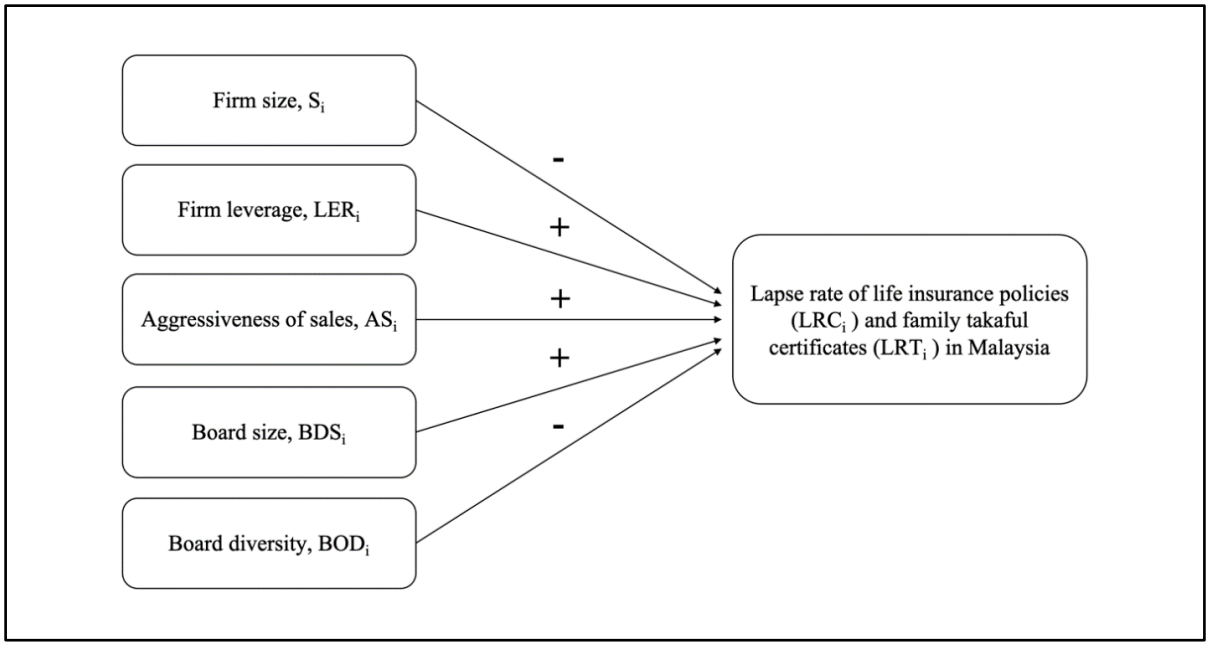
RESEARCH METHODS

Empirical Framework

Empirical model is being constructed as *ad hoc* basis to estimate (predict) lapse rates encompassing environmental, product and policyholders' characteristics (Srbinoski et al., 2019). This study considers solely the firm-specific characteristics (factors or variables, interchangeably) that previous studies have employed to witness the relationships between them and lapse rates of insurance policies, including family takaful certificates. Given the empirical nature of the lapse rates of life insurance/family takaful, firm-specific characteristics to be included in empirical framework (that are as simple as possible) are firm size, firm leverage, aggressiveness of sales, board size and board diversity in terms of gender. Figure 1 depicts visually their relationships.

Figure 1

Empirical Framework



- Firm size (Kisenbauer, 2012) – negative association (Yu et al., 2019). Larger firms are expected to be more financially stable and trustworthy to policyholders /certificate holders, thus deterring them from lapsing their policies/certificates (Kiesenbauer, 2012; Yu et al, 2019; Adams et al., 2020). It can be proxied by total annual premium, number of policies in force or total assets.
- Firm leverage (Yu et al., 2019) - positive association as a reflection of the firm's financial condition which may affect policyholders' or certificate holders' decision to lapse.
- The aggressiveness of sales (Adams et al., 2020) - positive association (Richardson & Hartwell, 1951) as aggressive selling by insurance agents/intermediaries may lead to misrepresentation or mis-spelling of life insurance and contribute to high lapse rates when customers eventually surrender their policies (Adams et al., 2020).
- Firm board size - positive association as there are advantages to have a more giant board which brings a variety of expertise and perspectives to the table. It may be a case of 'too many cooks spoil the broth' as a larger board size is subject to problems in coordination and cooperation with detrimental effects that trickle down to business direction and ultimately affect product design and persistency assumptions (Connelly et al. 2011). The relationship between board size and insurance lapse rates remains exploratory.
- Firm board diversity - negative association (Connelly et al., 2011) as the nature of the insurance industry is fundamentally based upon consideration of specific risks to groups and individuals who may not share the same characteristics. Gender diversity on the board is desirable for an insurer to fully understand customers' needs and strategize the creation of products to address the identified needs, leading to reduced lapses of insurance policies. Indeed, such a relationship remains empirical and exploration.

Data and Variables

A sample of 25 ITOs, consisting of 14 conventional insurers and 11 Takaful operators, has been collected for 2014-2022, viz. a (short) balanced panel data. Table 1 outlines the underlying variables, definitions, and their data sources. Table 2 reports the critical summary statistics [features] of the underlying variables for conventional life insurance and Family Takaful. The average lapse rate for conventional insurance is 3.8 percent, while it is 7.12 percent for family takaful, indicating the persistence of family takaful certificates is worse than conventional insurance policies in 2014 - 2022. The size of life insurance firms is more extensive than takaful operators in Malaysia as the life insurance firms can offer a larger variety of products to a larger pool of customers compared to takaful operators, which primarily identify Malaysia's Muslim population alone. The financial strength of ITOs in Malaysia is similar. Still, there are no instances where the firm is over-leveraged (i.e. more liabilities than assets) for the conventional sector, as in the takaful operators. However, more generally, takaful operators are slightly more aggressive in selling their products - aggressiveness in selling exceeds one implies high lapses in policies or certificates experienced by the firm especially within the first policy year. Looking at the board characteristics, both conventional insurers and takaful operators are fairly similar in terms of their board size and board diversity (i.e. less than 20% of board members are female). Table 3 is about the pairwise correlation coefficients between the underlying variables showing a relatively low correlation not higher than -0.498 (in an absolute terms).

Table 1

The Variables

Variable	Definition	Data source
Lapse rate, LR Life insurance policies, LRC Family takaful certificates, LRT	No. of policies surrendered divided by the sum of no. of policies in force at end of year and no. of policies surrendered, multiplying by 100.	ISM's (Insurance Services Malaysia) Statistical Yearbook 2014-2022.
Firm size, S	Firm size is proxied by the natural logarithm of the firms' annual new business premiums or contributions.	Respective firms' Annual Reports 2014-2022.
Firm leverage, LER	Ratio of total firms' liabilities to assets; to reflect the firms' financial strength.	Respective firms' Annual Reports 2014-2022.
Aggressiveness of sales, AS	The variable is proxied by number of new policies issued in the year out of total policies in force at the end of the year.	ISM's Statistical Yearbook 2014-2022.
Firm board size, BDS	Natural logarithm of the number of directors on the board at the end of the financial year.	Respective firms' Annual Reports 2014 - 2022.
Firm Diversity, BOD	Ratio of female to male board members as a proxy of gender diversity.	Respective firms' Annual Reports 2014 - 2022

Table 2

Summary Statistics

	Mean	Median	Standard deviation	Minimum	Maximum
Conventional Life Insurance					
Lapse Rate – Conventional, $LRC_{i,t}$	3.8%	3.2%	2%	1.7%	13.2%
Firm Size, $S_{i,t}$	18.281	18.191	0.952	16.525	20.482
Firm Leverage, $LER_{i,t}$	0.882	0.897	0.056	0.694	1.000
Aggressiveness of Sales, $AS_{i,t}$	0.139	0.075	0.179	0.028	1.318
Board size, $BDS_{i,t}$	1.824	1.869	0.219	1.099	2.197
Board Diversity, $BOD_{i,t}$	0.167	0.143	1.666	0.000	0.600
Family Takaful					
Lapse Rate – Takaful, $LRT_{i,t}$	7.12%	4.1%	9.7%	0.1%	73.6%
Firm Size, $S_{i,t}$	16.222	17.052	2.763	4.605	19.832
Firm Leverage, $LER_{i,t}$	0.863	0.869	0.696	0.665	1.149
Aggressiveness of Sales, $AS_{i,t}$	0.297	0.223	0.256	0.000	1.303
Board size, $BDS_{i,t}$	1.847	1.792	0.191	1.387	2.197
Board Diversity, $BOD_{i,t}$	0.158	0.143	0.161	0.000	0.75

Table 3

Correlation Matrix

	Lapse Rate	Firm Size	Aggressiveness	Leverage	Board Size	Board Diversity
Conventional Insurance						
Lapse Rate, $LR_{i,t}$	1.000					
Firm Size, $S_{i,t}$	-0.263	1.000				
Aggressiveness of Sales, $AS_{i,t}$	0.190	-0.155	1.000			
Leverage, $LER_{i,t}$	-0.111	0.498	-0.246	1.000		
Board Size, $BDS_{i,t}$	-0.286	0.046	-0.151	0.275	1.000	
Board Diversity, $BOD_{i,t}$	0.130	0.146	0.260	-0.122	-0.319	1.000
Family Takaful						
Lapse Rate, $LR_{i,t}$	1.000					
Firm Size, $S_{i,t}$	-0.037	1.000				
Aggressiveness of Sales, $AS_{i,t}$	-0.163	0.272	1.000			
Leverage, $LER_{i,t}$	-0.228	0.252	-0.070	1.000		
Board Size, $BDS_{i,t}$	-0.175	0.211	0.204	0.171	1.000	
Board Diversity, $BOD_{i,t}$	0.065	-0.212	-0.127	-0.044	-0.314	1.000

Testing Methods

This study employs both cross-sectional and panel data approaches to estimate the lapse rate relation with a set of firm-specific characteristics (Gemmo & Götz, 2016; Adams et al., 2020). Given a few time series observations (T=9), the panel data approach is more appropriate to yield more observations (TxN = 225) for estimating the associations between the variables over time. Nevertheless, as a baseline view, this study considers a set of cross-sectional regression models by ordinary least squares (OLS) estimators with 14 conventional insurers and 11 takaful operators for each observed year (i.e. year-by-year basis) from 2014 to 2022. Such estimates allow us to witness changes in the effect of a particular firm-specific factor(s) evolving. The linear regression models for conventional insurance and family takaful are described as equations (1) and (2).

$$LRC_i = \beta_0 + \beta_1 S_i + \beta_2 LER_i + \beta_3 AS_i + \beta_4 BDS_i + \beta_5 BOD_i + \varepsilon_i \quad (1)$$

$$LRT_i = \beta_0 + \beta_1 S_i + \beta_2 LER_i + \beta_3 AS_i + \beta_4 BDS_i + \beta_5 BOD_i + \varepsilon_i \quad (2)$$

where, LRC_i is the lapse rate for conventional insurance; LRT_i is the lapse rate for family takaful; β_0 is the constant; β_1–β_5 are the coefficients, ε_i is the error term; and *i* refers to individual firms.

The core analysis is based on OLS panel data regression model(s) with fixed effects method suggested by Hausman tests. The (short) balanced panel data (TxN) of conventional insurers is 126 observations, and 99 observations for takaful operators. First, the redundant fixed effects tests are conducted to reject the null hypothesis that the fixed effects are redundant. It evaluates if using fixed effects significantly improves the model fit compared to a pooled OLS model. Table 4 reports that most of the *p*-values are less than the 0.01 rejecting the null hypothesis and fixed effects model provides a better fit than the pooled OLS model. But, for the family takaful, two *p*-values are greater than 0.10 for Period F and Chi-Square Statistic. The Hausman statistics are also computed to determine whether the method is either fixed effects or a random effect. If the null hypothesis (i.e., the random effects model is appropriate) is rejected, fixed effects are the preferred method, otherwise, random effects are to be chosen. Table 5 shows both conventional insurance and family takaful have their *p*-values less the 0.05 thus, the null hypothesis can be rejected, and the fixed effects method is preferred over the random effects model. [9]

Table 4

Redundant Fixed Effects Tests

Effects Test	Statistic	Degrees of freedom (d.f)	*p*-value
Conventional Insurance			
Cross-section F	17.735***	(13,99)	0.000
Cross-section Chi-square	151.532***	13	0.000
Period F	3.054***	(8,99)	0.004
Period Chi-Square	27.795***	8	0.001
Cross-Section/Period F	12.166***	(21,99)	0.000
Cross-Section/Period Chi-square	160.722***	21	0.000
Family Takaful			
Cross-section F	12.657***	(10,75)	0.000
Cross-section Chi-square	97.878***	10	0.000

(continued)

Effects Test	Statistic	Degrees of freedom (d.f)	*p*-value
Period F	0.991	(8,75)	0.450
Period Chi-Square	9.945	8	0.269
Cross-Section/Period F	7.618***	(18,75)	0.000
Cross-Section/Period Chi-square	102.927***	18	0.000

Notes: ****p*-value < 0.01. N=14 for conventional insurance, N=11 for family takaful, sample period 2014-2022 (T=9).

The panel data lapse rate equations are described by equation (3) for conventional insurance and equation (4) for family takaful.

$$LRC_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 LER_{i,t} + \beta_3 AS_{i,t} + \beta_4 BDS_{i,t} + \beta_5 BOD_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$LRT_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 LER_{i,t} + \beta_3 AS_{i,t} + \beta_4 BDS_{i,t} + \beta_5 BOD_{i,t} + \varepsilon_{i,t} \quad (4)$$

where, *i* refers to individual firms, and *t* refers to time dimension.

Table 5

Hausman Tests

	Chi-Sq. Statistic	Chi-Sq. d.f.	*p*-value
Conventional Insurance:			
Cross-section random	12.441**	5	0.029
Family Takaful:			
Cross-section random	11.129**	5	0.049

Note: **p-value.

EMPIRICAL RESULTS

Baseline Results - Cross-Sectional Analysis

The estimates of equations (1) and (2) for 14 conventional life insurers and 11 takaful operators are illustrated in Tables 6 and 7 respectively, between 2014-2022. Their estimates may be interpreted with caution because of slight sample bias. The computed adjusted R^2 is relatively low, ranging between -0.045 and 0.54 for conventional life insurers and -0.079 and 0.51 for family takaful. In Table 6, for conventional life insurers, the lapse rate is reduced by a rise in firm size for 2014, 2019-2021, as they are statistically significant as their *p*-values are less than 0.10. Such estimates are consistent with the empirical framework, indicating that other things being equal, larger conventional life insurers tend to have lower lapse rates compared to smaller insurers during observed years. It can be partially explained by the fact that larger firms may have more robust brand recognition, which enables them to inspire more trust from customers and ability to retain more customers through economies of scale – further reducing average costs. Firm size does not affect the lapse rates of family takaful at all, as shown in Table 7, none of the estimated coefficients of firm size is statistically significant, with *p*-values less than 0.10.

Staying at Tables 6 and 7, firm leverage determines the lapse rates of conventional life insurance and family takaful, but they are in opposite directions. It is positively association with lapse rate of conventional insurance and statistically significant at 10 percent significance level in 2017, 2020 and

2021. This suggests that higher financial leverage explains higher lapse rates for conventional insurers in these years. In contrast, firm leverage has a negative sign for the lapse rates of family takaful for 2017 and 2018, which are statistically significant at a 5 percent level (or the *p*-value is less than 0.05). This finding is inconsistent with the previous studies of a positive sign of the estimated coefficient. It is posited that this is due to the existence of highly leveraged takaful operators, unlike life insurers (i.e. no firms with leverage above 1). There are also large, foreign-owned life insurers compared to takaful operators with access to more capital and resources.

The aggressiveness of sales does explain the lapse rates of conventional life insurance only for the years 2017 and 2021 with an opposite sign. In 2017, sales aggressiveness of sales was statistically significant at a 1 percent level, with a positive sign that more aggressive sales efforts by conventional insurers are linked to higher lapse rates. However, it turns into a negative sign in 2021 (statistically significant at 5% level) and implies an improvement in selling practices despite the aggressive nature which enables policies to persist. In this regard, insurers may have employed specific selling strategies in 2021 that allow them to improve sales while keeping lapse rates low, using improving needs-based selling, or product disclosure practices.

As shown in Table 6, other firm-specific characteristics such as board size and board are not statistically significant at the 10 percent level, indicating no impact of these corporate governance variables on lapse rates of conventional insurers over the sample period of 2014-2022. Similar finding is observed for family takaful operators, as in Table 7. This implies that board characteristics do not directly affect the persistence of insurance policies and family takaful. It is possible that while the board provides the overall business direction, they do not directly dictate and influence the insurance products which is mainly determined and proposed by the actuarial department based on product level data (i.e. past products' persistency history, complaints received and specific objectives of distribution partners). To recap, for the lapse rates of family takaful, firm leverage is the only factor for the years 2017-2018. For visual convenience, the estimated coefficients of each firms' characteristics are plotted as Figures 2(a)-(e).

Panel Data Analysis of Fixed Effects Model

The estimates of panel data equation (3) are documented in Table 8. Conventional life insurers' lapse rates are either inconsistent signs or other statistically significant factors (at a 5% level) compared to the cross-sectional OLS estimates in Table 6. Firm leverage is now in negative, describing the lapse rates of conventional life insurance drop given higher firm leverage, contrary to Yu et al. (2019). While this is not within the study's expectations, it could be due to highly leveraged insurers' proactive management of policyholder lapses. Considering high lapse rates pose a risk to the insurer's solvency, measures may have been taken to minimise policy lapses as one of its risk management plans. Meanwhile, board diversity becomes statistically significant at a 5 percent level, implying more board diversity would lead to a high lapse rate. This is also contrary to the expectations of the study described in an empirical framework, which predicted a negative association between the variables. Other firm-specific characteristics are statistically insignificant, such as firm size and aggressiveness of sales in cross-sectional estimates, now become insignificant after including time dimension (i.e. panel data).

In Table 9, board diversity (in terms of gender) is the sole firm-specific factor determining the lapse rates of family takaful operators, which is statistically significant at 10 percent level with a negative sign. More diversity in the board lowers the lapse rates for family takaful operators. It relates to the

fundamental nature of insurance that prices and designs products based on specific risks to groups and individuals. Gender diversity allows for a more comprehensive consideration of customers' needs to create better products with high persistence. In contrary to the cross-sectional findings, firm leverage is the only factor that is now statistically insignificant. Such variation may be explained by the fact that, for conventional insurers, certain board members dominate board meetings, which negates the benefits brought on by diversity (that is seen as merely a token representation of a particular gender) or lack of relevant expertise of the board members for conventional insurers. Indeed, the adjusted R^2 of these panel data estimates is higher (0.711) for conventional life insurers than for family takaful operators, 0.586.

Table 6

Cross-Sectional OLS Regression Estimates – Conventional Life Insurers

Year	Firm Size, S_i	Firm Leverage LER_i	Aggressiveness of Sales, AS_i	Board Size, BDS_i	Board Diversity, BOD_i	Constant	Adjusted R^2	F-statistic (*p*-value)
2014	-0.020**	0.101	0.021	-0.017	-0.100	0.351*	0.181	1.575 (0.270)
2015	-0.013	0.230	0.068	0.030	-0.038	0.022	0.114	1.334 (0.341)
2016	-0.015	0.194	0.108	0.010	-0.023	0.112	0.132	1.394 (0.322)
2017	-0.011	0.244*	0.206***	0.012	0.002	-0.024	0.540	4.047 (0.040)
2018	-0.007	0.198	0.143	0.004	-0.005	-0.029	0.115	1.338 (0.340)
2019	-0.012**	0.214	0.0319	0.016	-0.030	0.036	0.278	2.000 (0.183)
2020	-0.006**	0.171*	0.002	0.007	-0.012	-0.011	0.194	1.624 (0.258)
2021	-0.008*	0.196*	-0.023**	-0.001	-0.032	0.010	0.250	1.867 (0.206)
2022	-0.008	0.169	0.003	-0.035	-0.035	0.105	-0.045	0.888 (0.531)

Notes: ****p*-value < 0.01, ***p*-value < 0.05, and **p*-value < 0.10.

Table 7

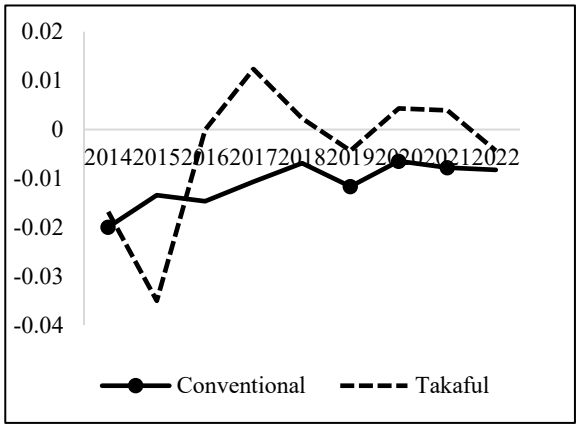
Cross-Sectional OLS Regression Estimates - Family Takaful Operators

Year	Firm Size, S_i	Firm Leverage LER_i	Aggressiveness of Sales, AS_i	Board Size, BDS_i	Board Diversity, BOD_i	Constant	Adjusted R^2	F-statistic (*p*-value)
2014	-0.017	0.349	-0.137	-0.203	-0.380	0.547	-0.744	0.147 (0.972)
2015	-0.035	0.816	0.197	0.207	-0.657	-0.465	-0.127	0.775 (0.607)
2016	-0.000	-0.783	0.093	-0.062	-0.047	0.863	-0.079	0.853 (0.567)
2017	0.012	-2.119**	-0.085	0.055	0.226	1.623**	0.455	2.668 (0.153)
2018	0.002	-0.996**	-0.075	0.034	0.181	0.807*	0.510	3.084 (0.121)
2019	-0.004	-0.073	-0.055	-0.125	0.021	0.421*	0.217	1.555 (0.320)
2020	0.004	-0.446	-0.047	0.005	-0.024	0.379	-0.414	0.414 (0.822)
2021	0.004	-0.047	-0.098	-0.087	0.041	0.197	-0.141	0.753 (0.618)
2022	-0.004	-0.073	-0.055	-0.125	0.021	0.421*	0.217	1.555 (0.320)

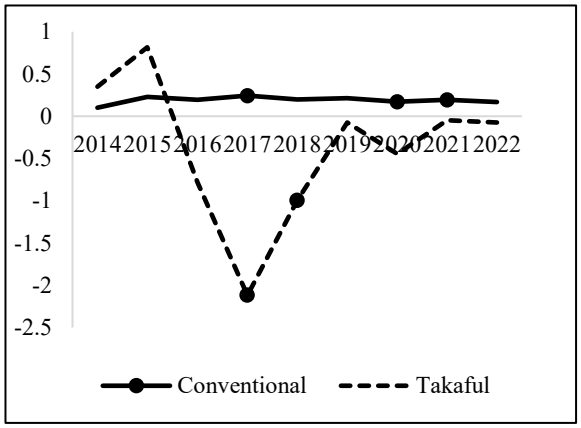
Notes: ***p*-value < 0.05, and **p*-value < 0.10

Figure 2

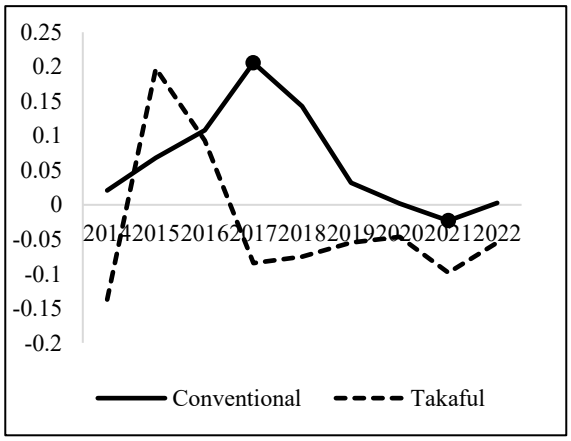
Plots of Estimated Coefficients (Cross-Section), 2014-2022



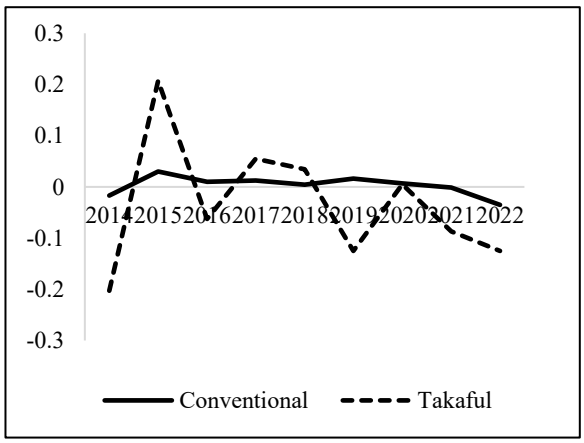
a) Firm Size, S.



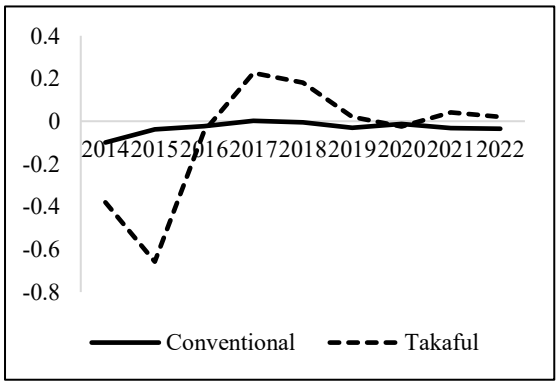
b) Firm Leverage, LER.



c) Aggressiveness of Sales, AS.



d) Board Size, BDS.



e) Board Diversity, BOD.

Note: A dot crossing the line indicates statistically significant at least at 10%.

Table 8

Panel Data Estimate of Conventional Life Insurers

	Coefficient	Standard Error	t-statistic	*p*-value
Constant	0.198**	0.070	2.816	0.006
Firm Size, $S_{i,t}$	-0.001	0.002	-0.540	0.591
Firm Leverage, $LER_{i,t}$	-0.145**	0.051	-2.843	0.005
Aggressiveness of Sales, $AS_{i,t}$	-0.004	0.007	-0.515	0.608
Board size, $BDS_{i,t}$	-0.006	0.006	-1.003	0.319
Board Diversity, $BOD_{i,t}$	0.020**	0.009	2.259	0.026
Effects Specification: Cross-section fixed (dummy variables) & Period fixed (dummy variables)				
R^2	0.771	Mean dependent variable		0.038
Adjusted R^2	0.711	S.D. dependent variable		0.020
Standard error of regression	0.010	Akaike info criterion		-6.089
Sum squared resid	0.011	Schwarz criterion		-5.481
Log likelihood	410.616	Hannan-Quinn criterion		-5.842
F-statistic	12.812	Durbin-Watson statistic		0.592
Probability (*F*-statistic)	0.000			

Note: ***p*-value < 0.05. N=14. 'var' stands for variable

Table 9

Panel Data Estimate of Family Takaful Operators

	Coefficient	Standard Error	t-statistic	*p*-value
Constant	-0.116	0.147	-0.786	0.434
Firm Size, $S_{i,t}$	-0.043	0.040	-1.086	0.281
Firm Leverage, $LER_{i,t}$	-0.000	0.004	-0.169	0.866
Aggressiveness of Sales, $AS_{i,t}$	1.176	0.127	1.379	0.172
Board size, $BDS_{i,t}$	0.047	0.040	1.189	0.238
Board Diversity, $BOD_{i,t}$	-0.175*	0.0051	-3.401	0.001
Effects Specification: Cross-section fixed (dummy variables)				
R^2	0.649	Mean dependent variable		0.072
Adjusted R^2	0.586	S.D. dependent variable		0.097
Standard error of regression	0.063	Akaike info criterion		-2.556
Sum squared residuals	0.326	Schwarz criterion		-2.136
Log likelihood	142.502	Hannan-Quinn criterion		-2.386
F-statistic	10.245	Durbin-Watson statistic		1.282
Probability (*F*-statistic)	0.000			

Note: ***p*-value < 0.05. N=14. 'var' stands for variable

CONCLUSION

This study offers ~~a~~ fresh evidence of lapse rates determination for both conventional insurance and family takaful for 2014-2022 by focusing on firm-specific characteristics, namely firm size, firm leverage, aggressiveness of sales, board of directors' size and diversity. A panel data considers 14 conventional insurers and 11 takaful operators. The cross-sectional estimates of lapse rate year-by-year over 2014-2022 show that firm size does reduce lapse rates for life insurance between 2019 and 2021, but no implication for family takaful. Second, the firm leverage has a positive impact on lapse rates of life insurance for 2017, 2020 and 2021 but a negative impact on family takaful during 2017-2018. Third, the aggressiveness of sales changes its impact from positive (2017) to negative (2021). Such observation informs that lapse rates may not be as significantly affected by firm-specific characteristics as other characteristics, such as policy-specific or customer-specific ones, as found by other studies. By considering both cross-sectional and time dimensions (i.e. panel data), inconsistent/different findings are occurred that firm leverage turns to negative sign, while diversity of the firm's board of directors (in terms of gender) does increase the lapse rates of conventional life insurance. Lastly, for the family takaful, only board diversity explains family takaful's lapse rates.

Several policy implications arise from this study, particularly in ensuring the ITOs are financially sound and do safeguard the financial stability of Malaysia's financial markets (system) with the implication of high lapse rates. Financial surveillance is essential for regulators as the firm-specific characteristics, especially leverage and board diversity, can be incorporated into the existing framework for financial market development and monitored to ensure possible economic issues are intuited promptly. Regulators may also enhance existing guidelines such as BNM's Policy Document on Corporate Governance to require a minimum level of diversity in the board of directors. At the firm level, ITOs may strive to be more conscious of the composition of their board and firm leverage levels by enhancing relevant constitutions and risk management frameworks to manage their products' lapse rates better and improve the company's profit by reducing overall policy lapses.

This study is imperfect. This study considers a short period of nine years (2014-2022), which may ignore some important historical information such as the 1997 Asian financial crisis, the 2007-2008 financial crisis (global financial crisis), and so on. The insurance industry in Malaysia has existed since the establishment of Insurance Act 1963, and the Takaful Act 1984, which raises the potential for a lapse rate study encompassing a much longer observed period. It is also acknowledged that the lapse rate data is often not available to the public as it is kept confidential as, it gives competitor a sense of an ITO's performance. It is especially difficult to obtain lapse rate data elsewhere prior to the establishing ISM. Besides, further research may incorporate more granular firm-specific characteristics alongside other macroeconomic, policy-specific or customer-specific variables to model better lapse rates behaviour in Malaysia. This study looks at the lapse rates of both conventional insurance and family takaful, separately within the industry. Interconnectedness may have been hidden between conventional insurance and family takaful, which has not been explored but may have important implications for better explaining the lapse rates of insurance markets. This is interesting, given that conventional insurers have a broader market than takaful operators' more specific customer base. Therefore, there exist instances where a customer may surrender or lapse their conventional insurance policy to take up a family takaful certificate, instead. Indeed, this intuition remains vacuum in the literature, and is recommended for future studies to discover.

ACKNOWLEDGEMENT

This research received no specific grant from any funding agency in the public, commercial or not-for profit sectors.

END NOTES

[1] It is worth noting that there is a 42 percent of adults own at least one life insurance policy or family takaful certificate.

[2] Berita Harian (2023). *Perlindungan Tenang Terus Dapat Sambutan.* Available at: ht[1] There are two strategies documented by Manteigas and Antonio (2024) for managing the risk of lapse, namely a reactive approach that the company responds after the customer has already lapsed. The second is a proactive approach which involves predicting which policyholders are likely to lapse and developing preventive retention strategies.

[3] Longevity risk: What it is and how to minimize it. Available at: https//www.britannica.com/money/longevity-risk-retirement

[4] Insurance plays an indirect and supporting role in five SDGs: quality education, industry, innovation and infrastructure, reduced inequalities, partnerships for goals and sustainable cities and communities.

[5] Insurance and the Sustainable Development Goals. Available at: https://a2ii.org/en/sustainable-development-goals

[6] The role of insurance in creating a sustainable world. Available at: https://www.paconsulting.com/insights/sustainability-a-market-and-moral-imperative-for-insurers

[7] Ageing and insurance: The opportunities of an older Europe. Available at: https://www.pwc.com/gx/en/insurance/pdf/ageing_and_insurance.pdf

[8] Navigating the future of care for older persons in Malaysia by 2040: From community support to technological integration - Malaysia will become an aging society in 2040. June 15, 2024, Available at: https://www.undp.org/malaysia/...tps://www.bharian.com.my/bisnes/lain-lain/ 2023/08/1137235/perlindungan-tenang-terus-dapat-sambutan

[9] According to Clark and Linzer (2015), the problem of high variance in the fixed effects model may produce estimates that are highly sample dependent that is, overly sensitive to the random error in a given dataset. Again, the fixed effects models require the estimation of a parameter for each unit - the coefficient on the unit dummy variable. For the random effects model, the problem of bias occurs that partial pooling can introduce in estimates of ß. The random effects model does not estimate separate unit effects, any correlation between x and α_j can imply an omitted variable z that produces bias in estimates of ß. In general, Hausman test is advised to detect violations of the random effects modelling assumption that the explanatory variables are orthogonal to the unit effects (pp.401-403). See, Hill, et al. (2020) for 12 limitations of fixed effects models. More technical explanations and applications of both models, see https://www.sciencedirect.com/topics/psychology/random-effects-model

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