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Economic and Socio-Demographic Factors that affect Takaful Demand in Malaysia

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ABSTRACT

The takaful sector in the Malaysian context has flourished although still young compared to its conventional insurance counterpart. However, the penetration rate and demand of this industry is still at lower rates set by Bank Negara Malaysia (BNM). This paper intends to find out the factors influencing the demand in takaful industry in Malaysia. It is done by investigating the economic factors (income, unemployment rate, inflation rate) and socio factors (life expectancy, educational attainment, urban population). The data for this research were retrieved from the Department of Statistics Malaysia and World Bank website. Thus, this study employed these variables to analyze factors impacting demand of takaful in Malaysia across the period from 1991 until 2020 by using time series regression. It is found that urban population has the highest impact as it has the highest coefficient compared to other independent variables. This study also performed Autoregressive Distributed Lag (ARDL) to investigate the short and long-run relationship between independent and dependent variable. The findings revealed that there is a relationship between life expectancy with takaful demand both in short-run and long-run. In contrast, there are long-run effects on demand of takaful for educational attainment, income, unemployment rate and urban population but not in the short-run. While no relationship is found with respect to inflation rate. Thus, it is hoped that the findings from this study will give impact and contribution towards the existing body of knowledge.

1. Introduction

Insurance is a type of risk management that is particularly used to prevent against financial loss. It is widely known that there are two forms of insurance which is conventional insurance and takaful. The takaful component will be the focus of this research. Takaful and conventional insurance share the same goal of assisting those who have suffered losses or are dealing with the aftermaths of accidents or any form of calamity.

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Takaful's popularity is evident, as it has evolved into a feasible substitute for conventional insurance. As far Muslims are concerned, they should be aware that conventional insurance is totally prohibited in Islam, hence takaful was created as an alternative for conventional insurance. This is because conventional insurance is believed to go against Islamic restrictions on *riba* (interest), *al-maisir* (gambling), and *al-gharar* (uncertainty) principles—all of which are outlawed in Shariah. Besides, since Malaysia is one of the countries with largest Muslim population, takaful is the best choice because it adheres to Shariah and Islamic Law. Therefore, this factor can influence consumers' demands for takaful products.

Over the last few years, Malaysia's takaful sector has grown at a remarkable pace. Based on Malaysian Takaful Association [1], the takaful industry in Malaysia witnessed exponential growth and an increase of 7.0% business gross contributions in 2020; although this was lesser compared to 2019. The contributions specific for the family takaful sector has shown an increasing trend from 2018 to 2022 as shown in Figure 1 below. However, the penetration rate of takaful is still low compared to conventional insurance. The family takaful is accounted for 38% of the total life insurance market in first half of 2020, whereas the general takaful for 16% of the total general insurance market [2]. This remark demonstrates that, despite the fact that takaful market penetration has been increasing year by year since 2005, the difference between takaful and non-Islamic insurance is still extremely considerable and takaful trails behind.



Fig. 1. Family takaful gross contributions 2018 to 2022 [1]

Moreover, the takaful industry is improbable to reach the 25 percent penetration rate target established by Bank Negara Malaysia's Financial Sector Blueprint 2011-2020 [1]. The chairman of Malaysian Takaful Association (MTA) stressed that Malaysia has relatively low penetration rate and takaful sector has yet to pursue a huge market growth prospect which is the young demography. As Bank Negara Malaysia begins to develop its next Financial Sector Blueprint beyond 2020, MTA will be ready to provide input from the sector.

Besides, it appears that many individuals still prefer conventional insurance over takaful as people are unaware of the existence or actual purpose of the takaful service in their everyday lives [3]. On the other hand, Bashir [4] also found that the government as well as takaful companies has revealed these issues to the public by introducing a few learning educational programs, but many individuals appear to be taking lightly of this takaful plan. Additionally, studies with regards to the demand of takaful in Malaysia are still quite limited in terms of empirical studies [5].

In order to accelerate this industry growth to its full potential in Malaysia and to draw more Muslim people to invest in takaful rather than conventional insurance, a number of researches must be conducted to determine which factors are the most important in this study. Due to the above reason, this study attempts to fill the gap between the variable as there are lack of research

on how does economic variables such as life expectancy affect the demand of takaful in Malaysia as not many researches explained much on this variable. Therefore, it is necessary to emphasize the variables that significantly drive takaful demand in order to assist takaful operators in taking better initiatives and to further support the development of this industry in Malaysia. Hence, the objectives of this research are:

- i. To investigate the short-run and long-run relationship between economic and socio factors on demand of takaful in Malaysia.
- ii. To identify which one of those factors that has the highest impact on demand of takaful in Malaysia.

2. Literature Review

Studies on takaful will be reviewed in more detail based on a few earlier studies on the subject. Since their research also concentrated on the relation between factors of demand in takaful, all of the data from previous research indicated the fundamental form of the research. Numerous aspects have been examined in previous research that can be related to this study in order to determine the relationship of elements that influence society's demand for takaful nowadays.

2.1 Dependent Variable

According to past studies on takaful demand analysis, there are few methodologies that have been applied. In a study of takaful demand, Redzuan [6] used advanced autoregressive distributed lag technique. This technique of analysis was used to identify potential short and long-term variations in insurance demand and theorised factors. There is also previous research has also applied the survey method to conduct their investigation [7]. The survey was intended to collect responses from takaful customers. Stepwise regression analysis is conducted to analyze the data, and found out that hypothesis based on previous study which is religious adherence affect the demand of takaful. Based on Bank Negara Malaysia (BNM), the demand for takaful product is represented by contribution per capita as the policies sold in the takaful pooling system. The increasing of the contribution per capita by year has shown that the takaful policies have a demand in Malaysia.

2.2 Independent Variables

2.2.1 Life expectancy

People with a longer life expectancy should spend less for mortality health coverage and have a lower perceived need for it. Hussels *et al.*, [8] asserted that if individuals live longer, there will likely be a greater demand for life insurance. This is because a longer life expectancy reduces insurance prices while also increasing incentives to accumulate human capital. Furthermore, Sherif and Sadia [9] found a significant correlation between life expectancy and insurance utilization. However, the research on this issue for takaful demand is still quite limited as mentioned in [5].

2.2.2. Income

The amount earned by a person might influence their intention in getting takaful as a long-term investment therefore income is likely to be the most important element affecting demand in

takaful. People with higher incomes are more likely to buy takaful since it appears to be more affordable to them rather than to people with lower incomes [10]. This is because to some individuals, earning more money could be due to the higher risk or danger they are exposed to; therefore, it is advantageous to obtain a takaful policy [11]. As a result, income shows a crucial role in determining the takaful demand.

2.2.3. Unemployment rate

Unemployment is another variable that could affect takaful demand. Generally, in order to acquire takaful goods, one needs have a source of income or a pay check. As a result, if an individual is unemployed, the likelihood of purchasing a takaful product is reduced. Therefore, it is likely to have an impact on general takaful demand. Consistent with this, based on prior studies by Remli *et al.*, [11] the unemployment rate has a negative significant relation with the demand for general takaful. The study shows that people are not sensitive to changes in this independent variable when they decide to take out insurance.

2.2.4. Inflation rate

Inflation is described as an increase in the overall level of prices for goods and services that will lead to fall of purchasing power. Thus, inflation is a significant aspect that individuals would consider as they will be more cautious when inflation changes, resulting in a lower number of individuals buying insurance [12]. Besides, Akhter and Saad [13] discovered that the connection among inflation and demand for insurance and takaful was trivial in prior studies. This indicates that when there is inflation, people will be less interested in takaful since their purchasing power will be eroded as the product's price rises. It is believed that inflation and takaful demand have a negative relationship.

2.2.5. Educational attainment

Ab Ghani and Salman [10] revealed that educational attainment has a positive and significant effect on takaful demand. When there are more educated people, then they will have more knowledge and awareness of the takaful product. People with a higher degree of education may be better able to comprehend the benefits of managing risk and long-term planning, resulting in increased risk aversion and increased demand for takaful [9]. Education level can contribute to elevated understanding and awareness of the merits of takaful, therefore those with more years of education may have a higher need and purpose for takaful [15,16]. Therefore, for the current study, secondary level was chosen since it is the common level of education among Malaysians. However, specifically for the general takaful sector, it was found that education did not have any significant effect towards demand [17]. Other than education level, reputation, awareness and religious adherence were significant predictors of demand for family takaful in Pakistan [19].

2.2.6. Urban population

Urbanization is another demographic aspect that has an effect on the need for takaful. This is because of industrialization and the growth of cities and towns as it offers chances for the insurance industry to expand, particularly in developing economies. This indicator has a positive coefficient and is highly related to takaful demand. The strong relation between urban population

and demand of takaful indicated by the urbanization element was found by empirical finding [13]. Additionally, although Shi *et al.*, [20] revealed that economic development was one of the main factors to enhance demand for health insurance in China, variables such as the ageing population and urbanization still needs further studies to confirm the relationship between them.

3. Methodology

This section will discuss on the data and methodology that have been utilized to carry out this study in detail including obtaining data, as well as formula drafting. Using secondary data, this study intends to examine factors that determine the demand for takaful in Malaysia. The primary source of data is the Department of Statistics Malaysia and World Bank website. In this research study, all collection of data is using annual time series data type which is from year 1991 until 2020 to determine the causal relationship between all of the independent variable and demand of takaful in Malaysia.

3.1 Data Description

There are six independent variables in this study; the first one is life expectancy where data is collected by the total number of years, a person that expected to live. The unemployment rate is calculated by expressing the number of unemployed persons as a percentage of the total number of persons in the labor force. The inflation rate is the annual rate of increase of a price index which is the consumer price index over time. Income is calculated by using GDP per capita which is gross domestic product divided by midyear population. To measure the level of educational attainment, in this study enrolment ratio for secondary school is calculated by dividing the number of students enrolled in secondary education regardless of age by the population of the age group. Lastly, urban population is the percentage of the Malaysian population professed to live in urban area. Table 1 summarizes the variables in this study.

Table 1

Summary of variables

Variables	Abbreviation	Description
Takaful Demand	<i>D</i>	Net contribution of Takaful demand
Life Expectancy	<i>LE</i>	The number of years a person is expected to live
Unemployment	<i>UN</i>	The percentage of people in the labour force who are unemployed
Inflation Rate	<i>IR</i>	Annual rate of increase of a price index
Income	<i>GDP</i>	Gross Domestic Product per capita
Educational Attainment	<i>EA</i>	Percentage of the population completed secondary enrolment
Urban Population	<i>UP</i>	Share of urban population

3.2 Descriptive Statistics

Descriptive statistics generate a summary statistic for the data's basic characteristics and scale variables for takaful. Fundamental data will be included in the output such as mean, median, and mode is used to assess central tendency. In addition, minimum and maximum values, standard deviation, and variance are used to measure variability. This study will also compute the data's skewness and kurtosis to define the data's characteristics.

3.3 Unit Root Test (Augmented Dickey-Fuller)

In order to test the cointegration, it is essential to check for stationary of data. A time series is said to be a stationary if mean, variance and covariance are constant and not depending on time. The study deploys the Augmented Dicker-Fuller test to determine the stationarity of each variable. If there is an existence of a unit root, then it is a non-stationary time series and may produce spurious results. Therefore, it is needed to be differenced multiple times in order to make it stationary and for regression results validation. Once the best ADF model has been chosen, the study process continues by checking the presence of any unit root. If the p-value of the series data is less than 0.05, we reject the null hypothesis and therefore, we conclude that the series is stationary.

3.4 Autoregressive Distributed Lag (ARDL) Model

This study employed ARDL cointegration methodology following previous studies as a method to achieve first objective which is to capture both long-run and short-run cointegrating relationship between variables [6,17]. The ARDL model is seen to be better to other standard cointegration tests in that it may assess the long-run connection between variables in levels regardless of whether the causal regressors are $I(0)$ or $I(1)$. The following are the test hypotheses:

$H_0: \beta_i = 0$ (no cointegration)

$H_1: \beta_i \neq 0$ (cointegration exists)

If the null hypothesis for the bound test is rejected, it means the variables are cointegrated and have a long-term relationship. The long-run relationship is denoted as Eq. (1)

$$\begin{aligned} \Delta LNDD_t = & a_0 + \sum_{i=1}^p a_1 \Delta LNDD_{t-i} + \sum_{i=0}^{q_1} a_2 \Delta LNLE_{t-i} + \sum_{i=0}^{q_2} a_3 \Delta LNUN_{t-i} + \sum_{i=0}^{q_3} a_4 \Delta LNIR_{t-i} \\ & + \sum_{i=0}^{q_4} a_5 \Delta LNGDP_{t-i} + \sum_{i=0}^{q_5} a_6 \Delta LNEA_{t-i} + \sum_{i=0}^{q_6} a_7 \Delta LNUP_{t-i} \\ & + \beta_1 LNDD_{t-1} + \beta_2 LNLE_{t-1} + \beta_3 LNUN_{t-1} + \beta_4 LNIR_{t-1} + \beta_5 LNGDP_{t-1} \\ & + \beta_6 LNEA_{t-1} + \beta_7 LNUP_{t-1} + \varepsilon_t \end{aligned} \quad (1)$$

where,

Δ = first different operator

p, q_i = number of optimum lag orders

ε_t = random error terms

a_i = short – run coefficient

β_i = long – run coefficient

Next, the short run dynamic of the model and a lagged error correction term (ECT) are estimated using Error Correction Model (ECM), expressed as Eq. (2):

$$\begin{aligned} \Delta LNDD_t = & a_0 + \sum_{i=1}^p a_1 \Delta LNDD_{t-i} + \sum_{i=0}^p a_2 \Delta LNLE_{t-i} + \sum_{i=0}^p a_3 \Delta LNUN_{t-i} + \sum_{i=0}^p a_4 \Delta LNIR_{t-i} \\ & + \sum_{i=0}^p a_5 \Delta LNGDP_{t-i} + \sum_{i=0}^p a_6 \Delta LNEA_{t-i} + \sum_{i=0}^p a_7 \Delta LNUP_{t-i} + \gamma ECT_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

γ represents as the coefficient of error correction term (ECT) that measure how the much the adjustment takes place to return to its long-run equilibrium. The error correction model (ECM) work when the error correction term (ECT) is negative value.

3.5 Variance Inflation Factor

This method is used in order to detect multicollinearity between the variables. When two or more independent variables in a multiple linear regression model are significantly correlated, this is known as multicollinearity. The presence of a high level of multicollinearity between variables makes it more difficult to evaluate whether explanatory variables are genuinely exerting an influence on the dependent variable.

3.6 Time Series Regression Model

Time series regression model was used to achieve the first objective which is to investigate the impact of life expectancy, unemployment rate, interest rate, income, employment rate and urban population on takaful demand. The following is the regression model that specified in Eq. (3):

$$D = \beta_0 + \beta_1 LE_t + \beta_2 UN_t + \beta_3 IR_t + \beta_4 GDP_t + \beta_5 EA_t + \beta_6 UP_t + \varepsilon_t \quad (3)$$

where D denotes as total of net contribution of takaful. LE, UN, IR, GDP, EA and UP are life expectancy, unemployment rate, inflation rate, income, educational attainment and urban population respectively. From Equation 3, we modified the new equation form by logging each of the variables in order to avoid increasing the non-linearity relationship between the variables as depicted in Eq. (4):

$$LND = \beta_0 + \beta_1 LNLE_t + \beta_2 LNUN_t + \beta_3 LNIR_t + \beta_4 LNGDP_t + \beta_5 LNEA_t + \beta_6 LNUP_t + \varepsilon_t \quad (4)$$

The hypothesis testing is used to test the significance of the sample data by providing two different hypotheses which are the null hypothesis and alternative hypothesis. These two hypotheses were analyzed to determine whether reject or fail to reject the claims at a specified level of significance. The hypothesis statements in this study are represented as:

$$H_0 : \beta = 0$$

$$H_1 : \beta \neq 0$$

4. Result and Discussion

4.1 Descriptive Statistics

Summary descriptive statistics of all variables used in this study are reported in the Table 2 above. The result of the analysis shows the span of thirty years period of data which is from 1991

until 2020. For example, for demand of takaful, represented by the net of contribution takaful shows a significant growth from RM90 million to RM11.63 billion. This indicates that the growth of takaful demand has progressed substantially in the industry. From the result, the value of standard deviation for the demand of takaful variables is larger compared to other variable which explains the large amount of variation of the data. Demand for takaful, life expectancy and urban population shows a positive skewness that explains the moderate skewness of the data. Thus, in order to avoid any potential problem for further analysis, the data will be measured in logarithm to produce the fit data.

Table 2
Descriptive statistics

	Mean	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
DD	3.351403	0.090300	11.62828	3.614856	0.899063	2.595239
EA	0.770126	0.645256	0.854491	0.071170	-0.743056	2.202136
GDP	0.053075	-0.073594	0.100027	0.041018	-1.643704	5.684230
IR	0.253600	-0.011400	0.054400	0.014915	-0.070277	2.881544
LE	0.002530	0.001900	0.003700	0.000490	0.912051	4.161056
UN	0.033560	0.024500	0.045040	0.004028	0.287906	4.550567
UP	0.659202	0.505760	0.771600	0.080895	-0.363704	1.929072
Observations	30					

4.2 Unit Root Test (Augmented Dickey-Fuller Test)

The Augmented Dickey Fuller (ADF) unit root test is applied to investigate the stationarity of the data. In this test, if the p-value of parameter is less than 0.05, it means that the null hypothesis was rejected and the variable is stationary. According to the result obtained from Table 3, the variables of income, inflation rate, life expectancy and urban population are able to reject the null hypothesis at 5% significance level and have no unit root. Therefore, the order of integration for GDP, IR, LE and UP is I(0). Meanwhile, p-values of variables of demand of takaful, educational attainment and unemployment rate fail to reject the null hypothesis at 5% significance level. It shows that the variable contains a unit root at the level form. The first difference is then being performed to these variables. As a result, the variables are found to be stationary which results in rejecting the null hypothesis at 5% significance level and are integrated at I(1). Hence, the ARDL analysis is carried out in level form and first differences which being denoted as DD, EA, GDP, IR, LE, UN and UP.

Table 3
Result for unit root at 5% significance level

	Level	Result	1st Difference	Result	Conclusion
	p-value		p-value		
DD	0.5532	Fail to reject H_0	0.0043	Reject H_0	I(1)
EA	0.3972	Fail to reject H_0	0.0002	Reject H_0	I(1)
GDP	0.0003	Reject H_0	-	-	I(0)
IR	0.0068	Reject H_0	-	-	I(0)
LE	0.0200	Reject H_0	-	-	I(0)
UN	0.1561	Fail to reject H_0	0.0024	Reject H_0	I(1)
UP	0.0156	Reject H_0	-	-	I(0)

4.3 Autoregressive Distributed Lag (ARDL) Model

Since the series are integrated of different orders that is having a combination of $I(0)$ and $I(1)$ series, we can apply the ARDL model to determine the presence of cointegration among the variables for the period of 1991-2020. Cointegration analysis is used to assess the relationship of the variables in the long-run and short-run. If the variables are cointegrated, therefore, there is a long-run relationship between dependent variable and independent variables. Table 4 shows the findings of the ARDL bound test for the independent variables and takaful demand.

Table 4

ARDL bound test for testing the presence of long-run relationship

	Value	K = 6
F-statistic	18.03994	
Critical value bounds		
Significance	$I(0)$	$I(1)$
10%	1.99	2.94
5%	2.27	3.28
1%	2.88	3.99
Conclusion	Cointegration exist	

The best model is chosen based on the Akaike Information Criteria (AIC) criteria. The model ARDL (1, 1, 0, 0, 1, 0, 0) is the best model because it has the lowest AIC value. The result of bound tests showed that the F-statistics (18.03994) is higher than lower bound critical value (2.88) and upper bound critical value (3.99) at all significance level. This value shows that the variables in the model are cointegrated. There is a long-run equilibrium relationship between demand of takaful and other independent variables.

Table 5

Long run relationship of ARDL (1, 1, 0, 0, 1, 0, 0) model

	Coefficient	Std. Error	t-Statistic	p-value
EA	-1.877193	0.665163	-2.822154	0.0109
GDP	-0.028703	0.034182	-0.839711	0.4115
IR	0.013715	0.034699	0.395267	0.6970
LE	0.537122	0.167470	3.207280	0.0046
UN	0.346148	0.170847	2.026073	0.0570
UP	9.234888	2.055240	4.493338	0.0002
C	7.992621	1.903462	4.198992	0.0005

According to Table 5, educational attainment is significant at 5% level in the long-run relationship. This is supported by Redzuan [6] where the higher level of education is significant in the long-run toward the demand for takaful. Furthermore, the result for long-run relationship indicates that income is positively insignificant for takaful demand, and therefore it is inconsistent with Ab Ghani and Salman [10] and Shah *et al.*, [18] where both studies found that income is a strong forecaster for demand of takaful. The same goes for inflation rate where the variables are not significant at any significance level in the long-run term. These findings for inflation rate are in line with Shah *et al.*, [18] where it is found that there is insignificant relationship between inflation rate and demand of takaful.

In addition, the estimated p -value of the long-run relationship was found to be statistically significant for life expectancy at 5% significance level. The findings for this variable do support Ab

Ghani and Salman [10] that found life expectancy shows an effect on demand of takaful. This shows that people who have a longer life span, they would likely increase the demand for takaful. Based on the result, unemployment rate is found statistically significant at 10% level. It is opposed with the prior studies that found unemployment rate has a negative significant relation with demand of takaful [12,17]. In the long-run, the effect of takaful demand on urban population was found significant. This follows Sherif and Sadia [9] as well as Akhter and Saad [13] who claim that there is a positive relationship between higher population in urban area and demand of takaful. This variable also is the most significant factor compared to other explanatory variables with p -value 0.0002 for long-run. Thus, we found that urban population does impact takaful demand in the long-run.

Table 6

Short run relationship of ARDL (1, 1, 0, 0, 1, 0, 0) model

	Coefficient	Std. Error	t -Statistic	p -value
EA	-0.478434	0.366199	-1.306488	0.2070
LE	0.239446	0.093896	2.550129	0.0196
ECT	-0.599248	0.042642	-14.05311	0.0000

Next, the short run dynamic of the model and a lagged error correction term (ECT) are estimated using Error Correction Model (ECM), expressed as Table 6. The coefficient error correction term (ECT) illustrates how swiftly equilibrium shifts from short-run to long-run. ECM should be statistically significant with negative sign to prove that established long-run relationship is stable. Thus, the result obtained from co-integrating form indicates that the coefficient has negative sign which is -0.599248 and significant at level 1% which is probability value at 0.0000. Based on Table 6, the outcome for short run relationship of ARDL indicates that life expectancy variable is statistically significant at 5% level with probability value of 0.0196 in the short-run. However, for educational attainment it is found to be insignificant in the short-run with p -value at 0.2070. Thus, it can be concluded that there is short-run relationship for life expectancy variable with demand of takaful while for educational attainment, there is no short-run relationship with dependent variable.

4.4 Variance Inflation Factor

In order to identify the multicollinearity, we performed the variance inflation factor (VIF). If the VIF value greater than 10, it means the collinearity among the variables is so high. While there is no problem with multicollinearity that may be affected the regression analysis if the VIF value are less than 10. Based on Table 7, it indicates that the VIF values for all independent variables are less than 10. Thus, we can conclude that there is less correlation between the independent variables and dependent variable and that we can distinguish between the individual effects of the independent variables on the dependent variables in the regression model.

Table 7

Result for variance inflation factor

	Coefficient	Centered VIF
EA	0.497291	4.854267
GDP	0.003839	1.368388
IR	0.003397	1.682466
LE	0.035786	1.314963
UN	0.081415	1.260238
UP	0.320203	5.434926

4.5 Time Series Regression

This study used multiple linear regressions to analyze the demand of takaful with its determinant variable. The time series static model is used for:

$$\text{LNDD}_t = 12.7941 - 2.9606 \text{ LNEA}_t + 0.04063 \text{ LNGDP}_{2t} + 0.033744 \text{ LNIR}_{3t} + 0.702143 \text{ LNLE}_{4t} + 0.7107 \text{ LNUN}_{5t} + 15.1639 \text{ LNUP}_{6t} + \varepsilon_t \quad (5)$$

From Table 8, the regression coefficient for educational attainment is -2.960608, holding other independent variables fixed. This value illustrates that an increase in percentage of secondary enrolment will decrease demand takaful by 2.960608. Educational attainment does not impact significantly on the takaful demand in Malaysia as the calculated *p*-value is 0.5184 which is fail to reject the null hypothesis at 5% level of significance. This finding is found in contradict with Ab Ghani and Salman [10] that revealed educational attainment has a significant effect on takaful demand. In case of gross of income, with the proxy of GDP, the coefficient is positive and it has insignificant relationship with the demand of takaful. The positive sign suggests that increasing in income will also increase the takaful demand by 0.040634. As for the *p*-value (0.6196), it is not statistically significant at 5% significance level. This study's outcome is inconsistent with Ab Ghani and Salman [10] and Hawariyuni and Marhanum [17] stated people with higher income are more likely to buy takaful since it appears to be more affordable to them rather than to people with lower incomes. Nonetheless, the opposite findings might be explained because the changes of education and income in Malaysia may not be significant or the data is insufficient to see the impact on takaful demand.

Table 8
Summary of time series regression

	Coefficient	Std. Error	t-stat	p-value
(constant)	12.79407	1.271207	10.06451	0.0000
EA	-2.960608	0.705188	-4.198321	0.5184
GDP	0.040634	0.061957	0.655848	0.6196
IR	0.033744	0.067057	0.503210	0.0011
LE	0.702143	0.189171	3.711691	0.0204
UN	0.710733	0.285333	2.490894	0.0000
UP	15.16393	0.565865	26.79778	0.0000
R-squared	0.991903			
Adjusted R-squared	0.989790			
F-Statistic	469.5807			
Prob F-Statistic	0.000000			

In addition, inflation rate found to be statistically significant at 5% level with *p*-value of 0.0011 with the positive coefficient at value 0.03374. This finding is in line with past studies Akhter and Saad [13] that agreed with the positive and significant effect of inflation rate on demand of takaful as people will be more cautious when inflation changes. On the other hand, it is contradicted with Redzuan *et al.*, [14] and Hawariyuni and Marhanum [17] finding that discovered inflation and takaful demand have a negatively significance relationship. For life expectancy variable, it is found that it has a positive coefficient (0.702143). It shows that the variable has a positive influence on demand of takaful. This means any increasing in life expectancy will increase demand for takaful by 0.702143. Plus, the *p*-value for this variable is statistically significant at 5% level significance which

is 0.0204. These findings are in the same pace by past studies, such as Sherif and Sadia [9], which found a significant correlation between life expectancy and takaful utilisation.

In this study, unemployment rate is found to be affecting takaful demand as it is statistically significant at 5% level with probability value 0.0000. This study discovered the positive relationship between unemployment rates as the coefficient of the variable is 0.710733. It is opposed with the prior studies Kadir [12] that found unemployment rate has a negative significant relation with demand of takaful. Furthermore, the coefficient of urban population indicates that it gives positive impact of change in the demand of takaful which is 15.16393. The result of 0.0000 probabilities indicates that urban population is highly significant in this model towards the demand of takaful. The result found is consistent with previous study done by Akhter and Saad [13]. Thus, this indicator has a positive coefficient and is highly related to takaful demand.

Based on the regression analysis, estimated coefficient adjusted R-squared in this model are valued at 0.9897. This result shows that the regression explains 98% of the total variation in takaful demand which is the net of contribution of demand in Malaysia. So, the explanatory variable does explain much on the variation in the determinant of takaful demand. Overall, we can see that urban population has highest impact on takaful as it has the highest coefficient compared to other independent variables.

5. Conclusions

Based on the results and discussion, there are two outcomes that will be summarized. Firstly, for the first objective which is to investigate the short-run and long-run relationship between economic and socio factors on demand of takaful in Malaysia from 1991 until 2020 was successfully achieved. This study found that the educational attainment, life expectancy, unemployment rate and urban population have a significant effect on the takaful demand in long-run. This suggests that an increase in level of education as well as life expectancy is associated to generate more contribution to future demand of takaful. In urban area, there are greater effects on the amount of contribution of takaful in Malaysia. On the other hand, only life expectancy has a significant effect on both short-run and long-run. Conversely, inflation rate did not produce the expected results based on past studies which is, it does not impact the takaful demand in both long-run and short-run relationship.

Overall, the second objective of this study to identify which on of economic and socio factors that has the highest impact on takaful demand in Malaysia was successfully achieved. Time series regression estimations reveal that urban population has the highest impact on demand of takaful. It was proved from the analysis that urban population is directly proportional and significantly influence by takaful demand. This indicates that people who live in urban area are more cautious in order to protect themselves from any uncertainty event in the future. Hence, the awareness among people who live in more modernized places is higher.

There is still a lot of analysis required in this research to improve the study's predictability for future research. As a recommendation for future research, it is recommended to include related variables which are more prevalent such as mortality, Muslim population or another economic factors that may lead to a more precise and accurate finding in the future study. These variables should be compared in measuring the adequacy of takaful demand. As for the policy implementation, policy makers or takaful management can use this outcome to conduct an adequacy assessment and take steps in order to improve and generate more revenue in takaful sector.

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