Determinants of Takaful Demand: The Role of Macroeconomic and Human Development Indicators in Muslim Countries

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Abstract: This study investigates the macroeconomic and socio-economic determinants influencing the demand for Takaful (Islamic insurance) across selected Muslim countries between 2004 and 2016. Despite the growing global interest in Islamic finance, Takaful remains underdeveloped compared to other sectors such as Islamic banking and Sukuk. This research aims to identify the key factors affecting Takaful uptake by examining the effects of real interest rate, inflation, dependency ratio, and the Human Development Index (HDI), comprising per capita income, life expectancy, and education. Utilizing a fixed-effects panel regression model and net written premiums as a proxy for Takaful demand, the study draws on secondary data sourced from global financial and development databases. The findings reveal that real interest rate and dependency ratio have a significant negative impact on Takaful demand, whereas HDI components, particularly education and income, exhibit strong positive associations. Inflation, however, was found to be statistically insignificant. These results suggest that economic capacity and human development play a more crucial role in shaping Takaful behavior than short-term economic fluctuations. The study concludes that increasing financial literacy, income levels, and demographic balance can substantially enhance the growth of the Takaful sector. Policy recommendations include integrating Takaful awareness into education systems, incentivizing family-based products, and aligning regulatory frameworks with Shariah principles. The research contributes to filling a critical gap in the empirical literature and offers a foundation for future studies in Islamic insurance.

Keywords: Takaful demand, Islamic insurance, Human Development Index, Interest Rate, Dependency Ratio, Panel Data, Economic Fluctuations

1. Introduction

Over the past decade, the Islamic finance industry has experienced consistent growth, with a compound annual growth rate of 6% from 2012 to 2017 (Thomson Reuters, 2018). This expansion has been driven largely by the increasing demand among religiously observant consumers for financial services that comply with Islamic principles (Nomran et al., 2018). The Islamic financial sector comprises four core components: Islamic banking, Sukuk (Islamic bonds), Islamic equity and mutual funds, and Takaful, the Islamic alternative to conventional insurance. Despite the industry's overall growth, Takaful remains comparatively underdeveloped, accounting for just 1% of total Islamic financial assets, while Islamic banking alone commands a 75% share (Finance Forward, 2016).

Takaful, which originates from the Arabic term *kafalah* (guarantee), refers to a system of Islamic insurance that is based on mutual cooperation, solidarity, and shared responsibility among participants. Unlike conventional insurance, which is considered non-compliant with Islamic law due to elements of *riba* (interest), *gharar* (uncertainty), and *maysir* (gambling), Takaful operates on the principles of *tabarru* (donation) and *ta'awun* (mutual assistance), ensuring its compliance with Shariah (Daud, Hussin, Arifin, & Yazid, 2012; Billah, 2003). Its key objective is to provide financial protection to policyholders in a way that aligns with Islamic ethical and legal norms.

Although Takaful has made significant strides in countries like Malaysia, where comprehensive legislation and strong institutional support have enabled rapid market development, the penetration rate of Takaful remains low in many other Muslim-majority countries. For instance, in Pakistan, the Takaful sector accounts for only 4% of the total insurance market, with a penetration rate of just 0.8% (WTR, 2016). This underperformance, despite a predominantly Muslim population, highlights a disconnect between potential demand and actual market uptake.

The disparity in Takaful adoption across Muslim countries necessitates a deeper investigation into the determinants that influence its demand. Previous research has explored the uptake of conventional insurance and, to a lesser extent, Takaful, through frameworks such as the Theory of Planned Behavior (Ajzen & Fishbein, 2010), the Technology Acceptance Model (Davis et al., 1989), and the Innovation Diffusion Theory (Rogers, 1995). However, most of these studies have either concentrated on consumer behavior in specific national contexts (e.g., Malaysia, Indonesia) or adopted descriptive approaches without thoroughly examining macroeconomic and socio-demographic determinants across multiple countries.

This study addresses that gap by empirically analyzing the demand determinants of Takaful in selected Muslim countries over the period from 2004 to 2016. Specifically, it examines the influence of economic factors such as the real interest rate and inflation, alongside socio-economic indicators encapsulated in the Human Development Index (HDI), including per

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capita income, education, life expectancy, and the dependency ratio. The primary objective is to identify which of these variables significantly impact Takaful demand, measured through net written premiums, thereby contributing to both theoretical understanding and policy development.

In doing so, this research seeks to provide actionable insights for policymakers, financial regulators, and Takaful operators aiming to enhance market penetration and improve risk-sharing mechanisms in Islamic finance. By understanding the economic and social determinants of Takaful demand, stakeholders can formulate more effective strategies for expanding the reach of Shariah-compliant insurance services in Muslim societies.

2. Literature Review

The development of Takaful as a Shariah-compliant alternative to conventional insurance has gained scholarly attention over the past few decades. Rooted in Islamic jurisprudence and ethical principles, Takaful is grounded in the concepts of *tabarru* (donation), *ta'awun* (mutual cooperation), and *kafalah* (guarantee), which distinguish it fundamentally from conventional insurance practices that involve *riba*, *gharar*, and *maysir*, all of which are strictly prohibited in Islam (Daud et al., 2012; Billah, 2003). As a result, the Takaful model emphasizes solidarity and collective responsibility, rather than individual profit, positioning it as a form of risk-sharing rather than risk transfer.

Several scholars have emphasized the religious, ethical, and economic justifications for Takaful, tracing its roots to early Islamic practices such as *al-Aqilah*, wherein members of a tribe collectively contributed to compensating the family of a deceased individual (Billah, 2003). Moreover, Takaful contracts are considered aligned with the Islamic principles of *Masalih-al-Mursalah* (public welfare) and *Tawakkul* (trust in God), serving both spiritual and socio-economic objectives (Musleh-ud-Din, 1982; Sadiq, 2003).

Despite this rich conceptual foundation, empirical studies on Takaful have largely focused on its adoption in specific national contexts, particularly in Malaysia and Indonesia, where legislative support and institutional infrastructure have fostered relatively mature markets. Studies by Lada et al. (2009), Ahmad (2024), and Husin and Rahman (2016) have examined behavioral, attitudinal, and religious factors influencing Takaful uptake. These works generally employed models such as the Theory of Planned Behavior (Ajzen & Fishbein, 2010) and the Decomposed Theory of Planned Behavior (Taylor & Todd, 1995), focusing on micro-level consumer decision-making. While these frameworks offer valuable insights, they often neglect macroeconomic and structural variables that may also shape Takaful demand across countries.

Other researchers have investigated demand for insurance more broadly, including both conventional and Islamic forms. Outreville (1996) and Webb and Beck (2003) explored how income, interest rates, and inflation influence insurance consumption, reporting mixed results depending on national context and measurement proxies. More recent contributions by Han et al. (2010) and Khan and Akhter (2017) have underscored the importance of incorporating both economic and socio-economic variables, such as dependency ratios, education, and health indicators, when analyzing insurance demand in developing countries.

Within the Takaful literature, however, such comprehensive approaches remain limited. Notably, studies often fail to consider the combined effects of Human Development Index (HDI) components, such as per capita income, life expectancy, and education, despite their potential explanatory power. Additionally, the influence of demographic structures, particularly the dependency ratio, remains underexplored, even though early theoretical models of insurance demand (e.g., Yaari, 1965; Hakansson, 1969) emphasized its relevance.

The current study builds on this foundation by integrating both economic (inflation, real interest rate) and socio-economic (HDI and dependency ratio) factors into a unified analytical framework. This approach not only addresses the gaps in existing empirical literature but also aligns with the view that Takaful demand is shaped by a complex interplay of financial incentives, demographic trends, and institutional development (Cornett & Saunders, 2014; Outreville, 2013).

Furthermore, while conventional insurance has been widely examined in the context of developed markets, studies focusing on Takaful in developing or emerging Muslim economies remain comparatively scarce (Young & Ernst, 2014). This scarcity is particularly evident in countries such as Qatar and Pakistan, where the Takaful sector is still in its developmental stages. As such, there is a pressing need to conduct multi-country analyses that investigate how both structural and developmental variables affect Takaful penetration and consumer behavior.

2.1. Hypothesis Development

This study is grounded in a conceptual framework that examines the demand for Takaful as influenced by a set of macroeconomic and socio-economic variables: interest rate, inflation, dependency ratio, and the Human Development Index (HDI). These factors have been widely acknowledged in prior literature as key determinants of insurance and Takaful participation in Muslim-majority countries (Han et al., 2010; Outreville, 2013; Khan & Akhter, 2017). Drawing upon this theoretical foundation, the following hypotheses are developed.

Interest rate is a critical economic factor influencing individual financial decisions, including long-term investment in risk-mitigating instruments like Takaful. Previous literature presents mixed findings on the relationship between interest rate and Takaful demand. Some studies report a positive association, arguing that higher interest rates lead to greater returns on investment-linked Takaful plans, thereby enhancing the appeal of such products (Yazid et al., 2012). These increased returns may include dividends or accumulated cash values, which serve as incentives for policyholders.

However, several other studies report a significant negative relationship between interest rate and Takaful demand. For instance, Redzuan et al. (2009), Redzuan (2014), and Khan and Akhter (2017) contend that higher interest rates reduce the comparative attractiveness of Takaful products, especially when consumers opt for alternative savings mechanisms that offer more immediate or higher financial returns. Given these mixed findings and the risk-averse nature of long-term Islamic financial products, the following hypothesis is proposed:

H1: Interest rate significantly influences the demand for Takaful in Muslim countries.

Inflation reflects the general increase in prices within an economy and can directly impact consumers' purchasing power. According to Babbel (1981), when inflation rises, consumers become more cautious with discretionary expenditures, including insurance or Takaful contributions. As a result, demand may decline, especially for products perceived as non-essential.

Nonetheless, the literature offers mixed evidence. Li et al. (2007) found that inflation negatively affects the demand for less desirable insurance products, while Redzuan (2014) argued that inflation might not necessarily deter insurance usage, particularly when such products are integrated into essential financial planning routines. This study incorporates these theoretical nuances and formulates the following hypothesis:

H2: *Inflation significantly influences the demand for Takaful in Muslim countries.*

The dependency ratio, defined as the proportion of non-working individuals (below age 15 and above age 65) to the working population, can influence household financial dynamics. A higher dependency ratio implies greater financial burdens on the income earner, potentially affecting their ability to allocate funds toward long-term risk protection such as Takaful.

While some studies suggest a positive association, where higher dependency prompts individuals to secure Takaful coverage for dependents (Sheriff and Shaairi, 2013; Hock & Weil, 2006), other research, particularly in the context of constrained financial resources, suggests the opposite. Meier and Werding (2008) found that increasing financial responsibilities can reduce the disposable income available for voluntary financial products. In light of these perspectives, the hypothesis is stated as follows:

H3: *Dependency ratio significantly influences the demand for Takaful in Muslim countries.*

The HDI is a composite measure that captures socio-economic development through three dimensions: income, education, and life expectancy. Each of these factors has been linked to insurance demand in various contexts.

First, income plays a pivotal role. Higher per capita income typically leads to increased savings and risk mitigation behavior. Law et al. (2011) and Yazid et al. (2012) emphasize that individuals with higher incomes are more capable of purchasing Takaful products and more inclined to protect their wealth.

Second, education contributes significantly to financial literacy and risk awareness. Sheriff et al. (2013) noted that educated individuals are more aware of the uncertainties of life and the benefits of Takaful participation. Similarly, Ahmad (2024) and Browne and Kim (1993) found that education raises awareness of future risks and enhances the perceived value of insurance as a safeguard for family well-being.

Third, life expectancy reflects an individual's planning horizon. Higher life expectancy often increases the need for long-term financial security, particularly for retirement or medical expenses. Studies by Khan and Akhter (2017) and Remli et al. (2017) confirm that life expectancy is positively associated with insurance demand.

Taken together, these dimensions of HDI form a comprehensive indicator of an individual's capacity and inclination to engage with Takaful schemes. Based on this synthesis, the following hypothesis is proposed:

H4: *Human Development Index (HDI) significantly influences the demand for Takaful in Muslim countries.*
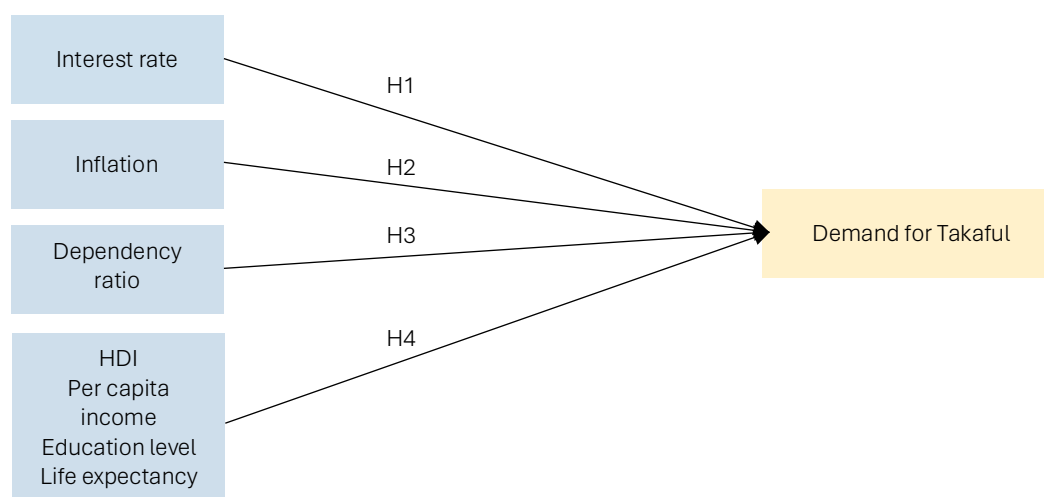

Figure 1: Research Framework

3. Methodology

This study employs a quantitative research approach to investigate the relationship between selected economic and socio-economic factors and the demand for Takaful across a sample of Muslim-majority countries. The decision to adopt a panel data methodology is driven by the nature of the dataset, which spans multiple countries over a twelve-year period, from 2004 to 2016. Such an approach enables the study to account for both cross-sectional and time-series variations, allowing for more robust and generalizable inferences.

The primary objective of this study is to identify the determinants of Takaful demand by examining the influence of inflation, real interest rate, dependency ratio, and the Human Development Index (HDI), which comprises per capita income, education, and life expectancy. These variables have been selected based on a thorough review of existing literature, which has highlighted their theoretical relevance and empirical significance in previous studies on insurance and Takaful demand (Outreville, 1996; Webb & Beck, 2003; Daud et al., 2012; Khan & Akhter, 2017).

The dependent variable in this study is Takaful demand, which is operationalized through the proxy of net written premiums, as is consistent with prior research and industry practice. Net written premiums reflect the actual volume of Takaful business underwritten during a specific period and serve as a practical measure of market demand. The independent variables include the real interest rate, inflation rate, dependency ratio, and HDI components. Data for these variables were sourced from credible international databases, including the World Bank and Sigma Statistics, ensuring accuracy and comparability across countries.

To estimate the relationship between the dependent and independent variables, the study employs a fixed-effects (FE) regression model. The choice of the fixed-effects specification is justified by the assumption that country-specific characteristics, such as regulatory frameworks, religious adherence, and institutional structures, may influence Takaful demand but remain constant over time. The FE model controls for these unobserved heterogeneities, allowing the estimation to focus on within-country variations over the observed period.

The model specification is as follows:

$Takaful\_Demand\_it = \beta_0 + \beta_1(InterestRate\_it) + \beta_2(Inflation\_it) + \beta_3(DependencyRatio\_it) + \beta_4(PerCapitaIncome\_it) + \beta_5(Education\_it) + \beta_6(LifeExpectancy\_it) + \mu\_i + \varepsilon\_it$

Where:

- i denotes the country,

- t denotes the time (year),

- μ_i represents the time-invariant country-specific effect,

- ε_it is the error term.

Before estimating the regression model, the study conducts descriptive statistical analysis and correlation diagnostics to examine the nature and strength of associations among variables.

4. Data Analysis and Interpretation

This section presents the empirical results of the study, beginning with descriptive statistics and correlation analysis, followed by the regression model estimation and interpretation of findings. The analysis is based on a balanced panel dataset covering eight Muslim countries over the period 2004–2016. The dependent variable, Takaful demand, is proxied by net written premiums, while the independent variables include real interest rate, inflation, dependency ratio, per capita income (LNPCI), education level, and life expectancy. The methodological rigor is enhanced through fixed-effects regression, validated by the Hausman test.

4.1. Descriptive Statistics

Descriptive statistics provide a summary of the central tendencies, dispersion, and range of the variables used in the study. Table 1 reports the mean, standard deviation, minimum, and maximum values for all variables across 104 observations. The average Takaful premium is 967.75 million, with a standard deviation of 1628.93, highlighting considerable variation across countries and time. Dependency ratio has a mean of 36.93, while the average per capita income is USD 31,109.55. Education level and life expectancy report mean values of 8.4 million and 75.26 years, respectively. The mean real interest rate is 1.48%, and average inflation is 3.95%.

Table 1: Descriptive Statistics of Variables (See attached table)

Variable	Observations	Mean	Standard Deviation	Min	Max
Takaful premiums	104	967.75	1628.93	15	7545.56
Dependency ratio	104	36.93	12.32	16.33	58.85
Per capita income	104	31109.55	22122.87	1148.57	88564.82
Life expectancy	104	75.26	3.64	66.97	83.1
Education level	104	8446081	15900000	119304	53400000
Real interest rate	104	1.48	7.52	-18.3	41.25
Inflation	104	3.95	3.58	-4.86	15.05

Source: Calculated by the author

These statistics suggest considerable diversity in socio-economic and macroeconomic contexts across the sampled countries, reinforcing the importance of country-level fixed effects in regression analysis.

4.2. Correlation Analysis

To examine the strength and direction of relationships among variables, Pearson correlation analysis was conducted. Table 2 presents the correlation coefficients. As per the interpretive thresholds defined by Verma and Bala (2013), Ahmad (2025), and Ndalu (2016), correlations between 0.00–0.30 indicate weak associations, 0.40–0.70 indicate moderate associations, and values above 0.70 indicate strong relationships. Furthermore, Gujarati (2003) and Bednarczyk (2013) caution that coefficients exceeding 0.80 may suggest multicollinearity.

Takaful demand demonstrates a moderate and positive correlation with education (r = 0.41) and per capita income (r = 0.44), while its association with dependency ratio (r = 0.30) is positive but weak. Inflation exhibits a weak and negative correlation (r = -0.11), and real interest rate also shows a weak positive association (r = 0.12). Among the explanatory variables, some strong inter-correlations exist, notably between life expectancy and education (r = -0.74), and between education and LNPCI (r = 0.81), though these remain within acceptable multicollinearity limits.

Table 2: Correlation Matrix for Takaful Demand Determinants (See attached table)

	Ln Takaful Premiums	Dependency Ratio	Education Level	Inflation	Life Expectancy	Lnpci	Real Interest Rate
Ln Takaful Premiums	1	0.3	0.41	-0.11	0.01	0.44	0.12
Dependency Ratio	0.3	1	0.52	0.04	-0.59	-0.74	0.16
Education Level	0.41	0.52	1	0.25	-0.74	0.81	0.14
Inflation	-0.11	0.04	0.25	1	0.32	0.14	-0.34
Life Expectancy	0.01	-0.59	-0.74	0.32	1	0.82	-0.02
Lnpci	0.44	-0.74	0.81	0.14	0.82	1	-0.13
Real Interest Rate	0.12	0.16	0.14	-0.34	-0.02	-0.13	1

Source: Calculated by the author

This preliminary analysis offers early support for the hypothesized relationships and validates the need for regression analysis to estimate the net effects of these variables on Takaful demand.

4.3. Regression Analysis

To test the hypothesized relationships and assess the determinants of Takaful demand, a fixed-effects panel regression model was employed. The Hausman test confirmed the appropriateness of the fixed-effects specification ($\chi^2 = 176.19$, $p < 0.01$). The regression results are presented in Table 3.

Table 3: Regression Results – Fixed Effects Model (See attached table)

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Dependency Ratio	-0.05	0.01	-5.93	0
Ln_Education	0.97	0.25	3.8	0
Inflation	-0.01	0.01	-1.5	0.13
Life Expectancy	0.22	0.06	3.75	0
Ln-Pci	0.35	0.16	-3.04	0
Real Interest Rate	-0.01	0		

Source: Calculated by the author

The model yields an R-squared value of 0.74, indicating that 74% of the variation in Takaful demand is explained by the independent variables. The F-statistic (230.13, $p = 0.000$) confirms the overall significance and robustness of the model, while the Durbin-Watson statistic of 1.48 suggests the absence of serious autocorrelation.

Real interest rate demonstrates a negative and statistically significant relationship with Takaful demand ($\beta = -0.04$, $p < 0.05$), consistent with the hypothesis that higher capital costs reduce long-term financial commitments. Inflation, while negatively signed, is statistically insignificant ($\beta = -0.01$, $p = 0.13$), suggesting that consumer price fluctuations do not significantly impact Islamic insurance behavior.

The dependency ratio shows a significant negative effect ($\beta = -0.05$, $p = 0.00$), implying that higher proportions of dependents constrain households' financial capacity to engage in Takaful. This aligns with the insurance behavior theories advanced by Yaari (1965) and Hakansson (1969), which highlight the role of household composition in risk-sharing decisions.

Importantly, all three components of the Human Development Index exhibit positive and statistically significant effects. Education shows the strongest influence ($\beta = 0.97$, $p = 0.00$), followed by per capita income ($\beta = 0.35$, $p = 0.02$) and life expectancy ($\beta = 0.22$, $p = 0.00$). These results reinforce prior findings by Daud et al. (2012) and Han et al. (2010), underscoring the role of socio-economic development in shaping Islamic financial behavior.

The empirical results provide robust support for the central thesis of this study: that Takaful demand in Muslim countries is significantly influenced by macroeconomic conditions and human development indicators. The positive effects of education and income suggest that financial literacy and purchasing power are central to Takaful market growth, while the negative role of interest rates and dependency ratios points to key structural constraints.

4.4. Hypothesis Testing

The first hypothesis posited that the real interest rate significantly influences the demand for Takaful in Muslim countries. The empirical findings confirm this hypothesis, as the real interest rate exhibits a statistically significant and negative relationship with Takaful demand ($\beta = -0.01$, $p = 0.00$). This indicates that a 1% increase in the real interest rate results in a 0.01% decrease in the demand for Takaful products, ceteris paribus. This outcome is consistent with the theoretical expectation that higher interest rates offer alternative investment opportunities with quicker returns, thereby reducing the attractiveness of long-term financial commitments such as Takaful. Moreover, when market rates are elevated, individuals may prefer short-term savings instruments or bank deposits over Takaful contributions, which often extend over many years. These findings align with previous studies by Chee and Haberman (2001), Redzuan et al. (2009), Sheriff et al. (2013), and Emamgholipour et al. (2017), all of whom reported similar inverse relationships between interest rates and Takaful uptake. Therefore, hypothesis H1 is accepted.

In contrast, the second hypothesis, which proposed a significant relationship between inflation and Takaful demand, is rejected. The regression results indicate a negative but statistically insignificant association ($\beta = -0.01$, $p = 0.13$). This suggests that fluctuations in the inflation rate do not meaningfully impact individuals' decisions to purchase Takaful products within the observed sample. This finding diverges from some earlier studies, such as those by Browne and Kim (1993), Outreville (1994), and Coolen-Maturi (2013), which found inflation to be a significant determinant. One plausible explanation for this divergence is that Takaful products, being long-term in nature and driven partly by religious motivation, may not be as sensitive to short-

term price volatility. Moreover, inflation reduces the purchasing power of consumers, thereby making Takaful contributions relatively more expensive and perceived as a luxury rather than a necessity (Babbel, 1985; Kjosevski, 2012). However, the lack of statistical significance in the present analysis implies that inflation alone does not drive consumer behavior in this context. Hence, H2 is rejected.

The third hypothesis suggested that the dependency ratio significantly affects Takaful demand. The results strongly support this claim, as the dependency ratio exhibits a significant and negative effect on Takaful uptake ($\beta = -0.05$, $p = 0.00$). This finding implies that a 1% increase in the dependency ratio leads to a 0.05% decrease in the demand for Takaful, holding all else constant. A higher dependency ratio, defined as the proportion of non-working individuals (below 14 and above 65 years old) to the working-age population, places greater financial burdens on income earners. This diminishes their ability to allocate funds toward voluntary financial products such as Takaful. These results corroborate earlier findings by Haiss and Sumegi (2006), Redzuan et al. (2009), and Carson et al. (2014), who also emphasized the constraining role of household demographics on insurance behavior. Therefore, hypothesis H3 is accepted.

Finally, the fourth hypothesis proposed that components of the Human Development Index (HDI), namely education, per capita income, and life expectancy, have a significant impact on Takaful demand. The results offer robust support for this claim. Per capita income is positively associated with demand ($\beta = 0.35$, $p = 0.02$), indicating that individuals with higher income levels are more likely to allocate resources to long-term financial protection. Life expectancy also shows a significant and positive association ($\beta = 0.22$, $p = 0.00$), suggesting that individuals anticipate longer post-retirement periods and thus invest more in financial instruments such as Takaful for future security. Most notably, education exerts the strongest influence ($\beta = 0.97$, $p = 0.00$), emphasizing the importance of financial literacy and awareness in shaping consumer preferences. These findings align with studies by Ahmad (2025), Akhter and Hussain (2012), and Remli et al. (2017), who demonstrated that improvements in human development contribute directly to higher insurance penetration.

Furthermore, higher per capita income enables greater disposable income, increasing the likelihood of Takaful investment for savings and protection. Life expectancy, as shown in the works of Besley et al. (1999) and Giesbert et al. (2011), motivates long-term financial planning, especially to meet post-retirement healthcare expenses. In parallel, education facilitates a deeper understanding of risk and insurance mechanisms, thereby fostering a proactive approach to financial risk management (Browne and Kim, 1993; Gustina and Abdullah, 2012). Given these results, hypothesis H4 is fully supported.

Table 4: Hypothesis Testing

Hypothesis	Coefficient (Œ≤)	p-Value	Interpretation
H1: Real interest rate significantly influences the demand for Takaful.	-0.01	0	**Accepted.** Real interest rate negatively and significantly affects Takaful demand.
H2: Inflation significantly influences the demand for Takaful.	-0.01	0.13	**Rejected.** Inflation has a negative but statistically insignificant effect on Takaful demand.
H3: Dependency ratio significantly influences the demand for Takaful.	-0.05	0	**Accepted.** Dependency ratio negatively and significantly affects Takaful demand.
H4: Human Development Index (HDI) significantly influences the demand for Takaful.	Income: 0.35, Life Expectancy: 0.22, Education: 0.97	0.02, 0.00, 0.00	**Accepted.** All components of HDI positively and significantly affect Takaful demand.

Source: Calculated by the author

5. Discussion

The purpose of this study was to examine the macroeconomic and human development determinants influencing the demand for Takaful in selected Muslim countries. The empirical findings derived from a fixed-effects panel regression model have important theoretical and practical implications. This section discusses the results in light of previous literature, highlighting areas of convergence and divergence.

The negative and significant relationship found between real interest rates and the demand for Takaful confirms a longstanding assertion in the insurance literature that higher opportunity costs of capital reduce the attractiveness of long-term financial instruments. This result is consistent with earlier studies by Chee and Haberman (2001), Redzuan et al. (2009), and Emamgholipour et al. (2017), who argued that as interest rates rise, individuals tend to divert their disposable income towards short-term savings or investment options offered by banks or financial institutions. Takaful, being a long-horizon savings and protection mechanism, thus becomes comparatively less appealing. This finding reinforces the argument that Takaful operators must offer competitive financial returns or value-based propositions to remain viable under fluctuating interest rate regimes.

In contrast, the relationship between inflation and Takaful demand was found to be negative but statistically insignificant. While studies such as Browne and Kim (1993) and Coolen-Maturi (2013) reported that inflation erodes real purchasing power and diminishes insurance uptake, our study's findings suggest that inflation alone does not serve as a robust predictor of Takaful participation. This divergence could be attributed to the unique nature of Takaful products, which are not merely financial instruments but also fulfill religious and social responsibilities in many Muslim-majority societies. As argued by Babbel (1985) and Kjosevski (2012), individuals may perceive insurance as a luxury good during inflationary periods, yet the religio-social utility of Takaful could moderate this response, leading to statistically weaker results.

The negative and statistically significant effect of the dependency ratio on Takaful demand aligns with the observations of Hwang and Greenford (2005), Haiss and Sumegi (2006), and Redzuan et al. (2009). A higher dependency ratio typically indicates a larger proportion of non-working individuals relying on the income of a single earner, thereby straining household budgets and reducing the capacity for discretionary spending on long-term protection schemes. These results reaffirm that financial vulnerability among households with numerous dependents discourages Takaful participation, particularly when such schemes are perceived as non-essential or deferrable expenses. Therefore, financial education and subsidy programs targeting low-income or high-dependency households may be crucial to broadening Takaful coverage.

Moreover, this study contributes novel insights by incorporating the Human Development Index (HDI) as a multidimensional determinant of Takaful demand. All three components, education, per capita income, and life expectancy, were found to have a positive and significant influence. These findings are in line with previous research by Akhter and Hussain (2012), and Remli et al. (2017), who emphasized the role of human capital development in expanding Islamic finance markets. Specifically, education appears to be the most powerful predictor, as it enhances financial literacy, risk awareness, and understanding of Takaful's cooperative and Shariah-compliant principles. Life expectancy, too, plays an important role in shaping long-term financial planning behaviors, as individuals anticipating longer post-retirement periods are more inclined to invest in protective schemes. Similarly, higher per capita income increases disposable income, which in turn facilitates the uptake of Takaful products.

Taken together, the findings demonstrate that demand for Takaful is shaped not only by traditional economic indicators but also by broader socio-economic and developmental conditions. The significant role of HDI components suggests that Takaful demand is increasingly tied to structural improvements in human welfare, education systems, and healthcare access. This multidimensional view of demand challenges earlier studies that relied solely on macroeconomic variables and offers a more holistic understanding of consumer behavior in Islamic financial contexts.

6. Conclusion

This study has examined the macroeconomic and socio-economic determinants of Takaful demand in selected Muslim countries using a fixed-effects panel regression model spanning the period from 2004 to 2016. The analysis focused on the relationship between Takaful demand, measured by net written premiums, and key explanatory variables including real interest rate, inflation, dependency ratio, and the components of the Human Development Index, namely per capita income, education, and life expectancy.

The findings provide compelling evidence that Takaful demand is significantly influenced by both economic and developmental factors. The real interest rate was found to be negatively associated with Takaful demand, indicating that higher interest rates may disincentivize individuals from engaging in long-term financial commitments. Although inflation exhibited a negative relationship, it was statistically insignificant, suggesting that short-term price fluctuations do not substantially alter the perceived value of Takaful products. In contrast, the dependency ratio demonstrated a significant negative impact, highlighting the financial pressures faced by households with a large proportion of non-working members.

Most notably, the components of the Human Development Index emerged as strong predictors of Takaful demand. Education had the most substantial positive effect, followed by per capita income and life expectancy. These results underscore the critical role of human capital in enhancing the understanding, trust, and perceived utility of Islamic insurance services. Therefore, while religious compliance remains central to the Takaful model, the market's expansion is equally contingent upon broader socio-economic development.

7. Policy Implications

The empirical insights from this study offer several important implications for policymakers, regulators, and Takaful providers. First, efforts to stimulate Takaful demand must go beyond religious messaging and instead integrate targeted strategies that address structural and developmental barriers. Enhancing financial literacy, particularly through national education systems and public awareness campaigns, is essential for expanding the reach of Takaful, especially in countries where the insurance culture is weak or misunderstood.

Second, the strong association between per capita income and Takaful demand suggests that policies aimed at inclusive economic growth and poverty reduction will indirectly benefit the Islamic insurance sector. Takaful providers, in collaboration with state institutions, should consider developing micro-Takaful schemes tailored to low-income populations, thereby improving financial protection for vulnerable segments of society while promoting market penetration.

Moreover, demographic considerations should be integrated into national Takaful strategies. Given the negative effect of the dependency ratio, initiatives such as tax incentives for family-based Takaful policies or subsidized plans for households with high dependency burdens could help mitigate affordability constraints. In this regard, governments may also consider embedding Takaful into national social security and healthcare programs to increase its legitimacy and reach.

Lastly, regulators should work to establish clear, harmonized frameworks that foster transparency, consumer trust, and cross-border integration within the Takaful industry. Lessons may be drawn from Malaysia's success in institutionalizing Takaful under a robust legislative regime, which has enabled the industry to evolve into a key component of the Islamic finance ecosystem.

8. Future Research Directions

Although this study contributes to the limited empirical literature on Takaful demand, several limitations should be acknowledged and addressed in future research. One of the primary constraints was the availability of consistent and reliable data across Muslim countries. The sample period, restricted to 2004–2016, reflects the limited public reporting by Takaful providers and regulatory bodies during that timeframe. As more recent data becomes available, future studies should extend the temporal scope to assess the long-term evolution of Takaful demand, especially in response to post-pandemic economic changes and digital transformation.

Additionally, while this study employed a set of macro-level indicators, it did not account for other potential determinants such as GDP growth rate, employment rate, money supply, religious intensity, and price competitiveness of Takaful versus conventional insurance. Future research could incorporate these variables to offer a more granular understanding of what drives consumer behavior in the Islamic insurance domain. It may also be valuable to examine institutional quality, regulatory diversity, and the role of Shariah governance in enhancing or hindering Takaful adoption.

Moreover, cross-regional comparisons, for instance between the GCC, Southeast Asia, and North Africa, could reveal unique structural and cultural dynamics affecting Takaful demand. Finally, there is scope for mixed-method research that

combines econometric analysis with qualitative insights from policy actors, industry leaders, and consumers, thereby offering a multidimensional perspective on the barriers and opportunities facing Takaful in the contemporary financial landscape.

In conclusion, the growth and sustainability of the Takaful sector depend not only on religious legitimacy but also on strategic economic policies, human development, and institutional readiness. A holistic, interdisciplinary approach, combining financial innovation with social equity, is essential for unlocking the full potential of Islamic insurance in the modern era.

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