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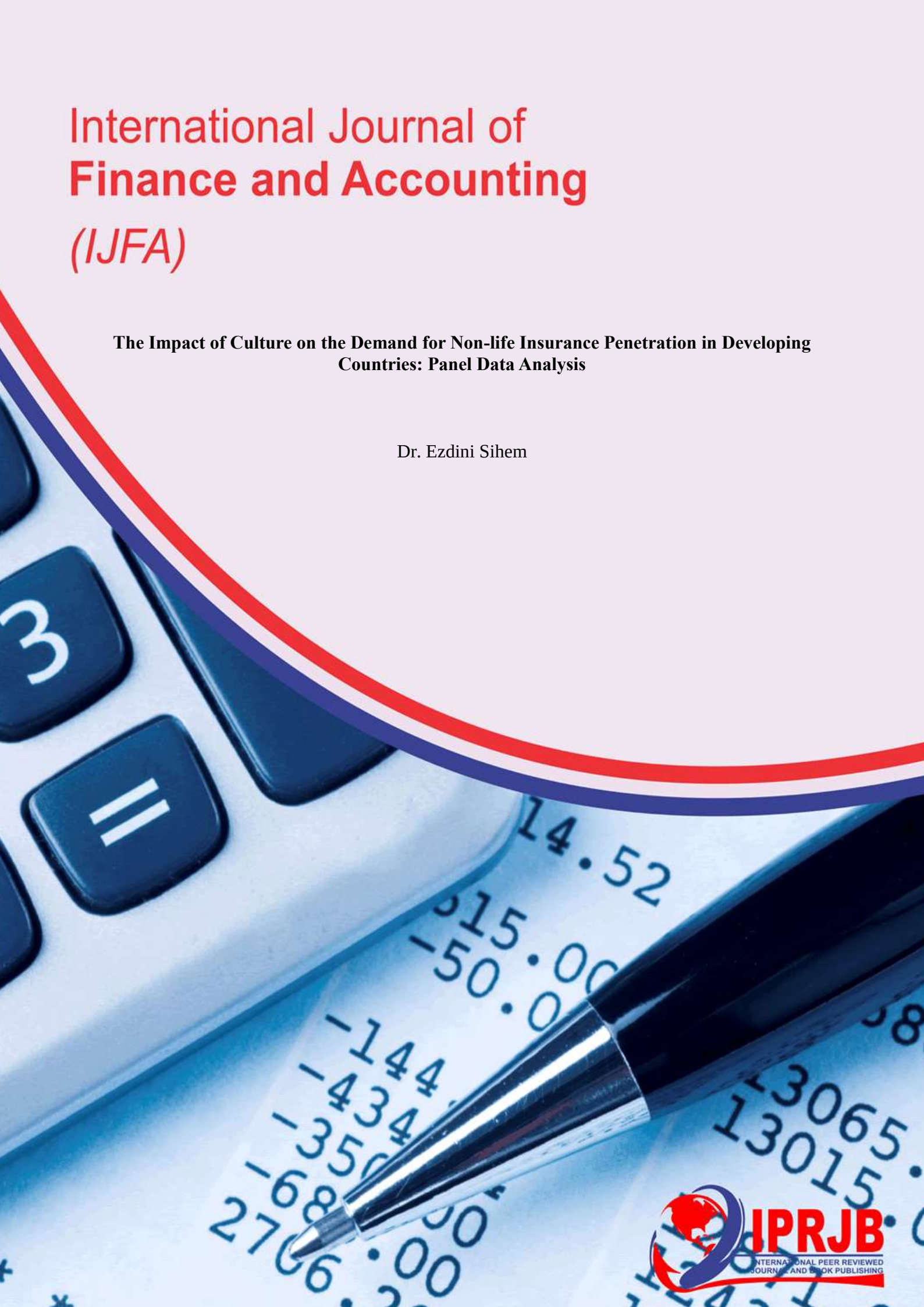

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# The Impact of Culture on the Demand for Non-life Insurance Penetration in Developing Countries: Panel Data Analysis

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**Abstract**

**Purpose:** The impact of insurance market activity within financial development is gaining more attention in academia, as the sector experiences growth within emerging markets. The paper aims to understand which macro-economic and social variables impact the growth or decline of the non-life insurance sector broadly across European countries with a view to provide recommendations to drive increased penetration across the region.

**Methodology:** Using Fixed Effects Panel Data Regression and annual data from 1990 to 2021 on 10 countries, the study examines the explanatory factors of non-life insurance demand in European countries (Australia, France, Austria, Italy, Canada, Luxemburg, Denmark, Norway, Finland and Portugal).

**Findings:** The study found that GDP, and urbanization and education rates have a significant negative impact on non-life insurance penetration and density; urbanization, religion, education level and rule of law can explain positively variation in non-life insurance density and penetration across countries. Countries with higher urbanization levels, higher education level, Christian or Buddhist beliefs and more effective rule of law spend more on non- life insurance than other countries. The control of corruption and government effectiveness explain negatively variance in non-life insurance.

**Unique Contribution to Theory, Practice and Policy:** Notably, governments can develop the non-life insurance sector through policies that support urbanization. Similarly, ensuring an environment that promotes economic freedom (such as low tariff, high personal choice, low government spending and high security of property rights) could be an effective way of promoting non-life insurance demand. In contrast, policies that help to reduce the rate of urbanization may yield a double dividend: less population and congestion in cities and better opportunities for the development of non-life insurance markets. Also, countries with high level of education, can develop the development of non- life insurance demand. Among many socio-economic factors such as income, urbanization and education level, our analysis suggests that cultural dimensions such as beliefs and rule of law play a role.

**Keywords:** *Non-Life Insurance Density, Macro Economic Factors, Non-Life Insurance Penetration, Religion, Institutional Variables*

**JEL Codes:** *G520; O110; Z120; D73.*

## INTRODUCTION

Development of insurance sector relates with various determinants like income, interest rate, education, occupation, marriage, divorce rate, urban household, non-human wealth, social preference, religion, dependency ratio, private saving as well as national culture. Results of these studies are calculated by analyzing the relevant data of various countries for separate periods.

But there are no such studies which try to find out the association between cultural dimensions and insurance sector development as well as appropriate cultural dimensions for the development of insurance sector among developing countries. These are the research gaps which motivated for this work.

To the best of our knowledge, culture has received little attention in the literature concerning the determinants of the life insurance and non-life insurance spending. The only exceptions are three recent papers by Chui and Kwok (2008), Park and Lemaire (2011) and Outreville (2018), which attempt to investigate the determinants of life insurance spending across economies. However, as we mentioned above, newly introduced cultural dimensions by Hofstede et al. (2010), and Minkov (2011), specifically indulgence and hypometropia, have been excluded from these studies. These cultural factors represent the level of optimism and violence in countries and may thus explain the life insurance spending pattern. Neglecting them may lead to the issue of endogeneity owing to the omitted variables. In addition, the cross-sectional dependence issue has been ignored by these papers.

Public health spending can also be another main driver in expanding life insurance consumption across economies. The positive effects of public health expenditure on economic growth, health outcomes and per capita income have been confirmed by several studies (e.g., Anand and Ravallion, 1993; Self and Grabowski, 2003; Amaghionyeodiwe 2008; Rizk 2012; Edeme et al. 2017; Boachie et al. 2018; Ifa and Guetat 2019; Patrick et al. 2020; Mustafa et al. 2021; Torche and Rauf 2021). Although there does not seem to be a direct link between the influence of public health expenditure life insurance purchases, a rise of wealth and income due to health improvements may impact the intention of individuals on life insurance consumption. Similarly, economic freedom can impact life insurance consumption because changes in economic freedom can lead to changes in the market price of life insurance products as well as income improvement. In addition, economic freedom can affect the life satisfaction or happiness of individuals, hence it may influence individuals' demand for life insurance products. To the best of our knowledge, there are not many papers devoted exclusively to cultural factors, public health expenditure and economic freedom that influence life insurance purchases across countries.

In our paper, the problem of the study is to analyze the dependence between non-life insurance demand represented by non-life insurance penetration, density and various factors from economics, finance, socio-demographics, and institutions.

The main purpose of this paper is two-fold. First, we explore national culture as potential determinant of non-life insurance consumption. Consumers may respond to insurance solicitations according to their cultural beliefs, not only on economic rationality. We test the effect of cultural measures on non-life insurance demand using a large international panel data that includes 10 countries in the period 1990-2021. We also introduce affiliation to one of the world's largest religions as cultural variables. Second, we investigate the importance of

economic and cultural factors on non-life insurance demand at different stages of economic development.

The paper is organized as follows. The literature review in section 2. Section 3 presents our data and methodology. Results are discussed in section 4. Section 5 provides our summary and discusses conclusions.

## LITERATURE REVIEW

Economic growth of a country significantly depends on insurance sector development (Peter & Kjeli, 2006; Cristea et al. 2014; Curak & Loncar, 2012 and Horng et al. 2011). Development of this sector depends on different elements. Despite the critical role that the insurance sector may play for financial and economic development and reasonable evidence that the sector has promoted economic growth, there have been few studies examining the factors that drive the development of the insurance sector.

The non-life insurance sector plays a critical role in financial and economic development, over the last few decades, as provider of financial services to consumers. By introducing risk pooling and reducing the impact of large losses on firms and households, the sector reduces the amount of capital that would be needed to cover these losses individually, encouraging additional output, investment, innovation, and competition. By introducing risk-based pricing for insurance protection, the sector can change the behaviour of economic agents, contributing to the prevention of accidents, improved health outcomes, and efficiency gains. Finally, the sector can also improve the efficiency of other segments of the financial sector, such as banking and bond markets (e.g., by enhancing the value of collateral through property insurance, and reducing losses at default through credit guarantees and enhancements).

But, the growth of non-life insurance did not raise on the same level, not only among industrial countries and developing countries, but also there is a difference between developing countries. The demand for insurance can be studied theoretically from a variety of perspectives, from adverse selection and demand elasticity (Thomas, 2009) to insurance as an investment tool competing with others (Mayers and Smith, 1983).

Practical approaches include a large body of research that applies econometric models to select the most appropriate factors that explain variations in the demand for life insurance across countries, with, as most frequently cited papers, Beck and Webb (2003), Browne and Kim (1993), and Outreville (1996). The dependent variables for the vast majority of models are the life insurance density (number of US Dollars spent annually on life insurance per capita) and the life insurance penetration (total life premium volume divided by GDP), published annually in Swiss Re's publication Sigma. Explanatory variables that have been shown to significantly impact life insurance demand are GDP per capita, inflation (real, anticipated, or feared), development of the banking sector, institutional indicators (such as investors protection, contract enforcement, and political stability), and whether Islam is the dominant religion or not. Burnett and Palmer (1984) appear to be the first authors to introduce nontraditional explanatory variables, by showing that psychographic characteristics such as religion, work ethics, fatalism, socialization preference and assertiveness can influence life insurance demand. Hofstede (1995) argues that national cultural features such as degree of solidarity, independence, and predictability

influence the development of insurance, and consequently make the integration of insurance in the European Union a difficult endeavor. Ward and Zurbruegg (2000) and Hwang and Greenford (2005) hint at the possible impact of cultural values.

It is, however, the work of Chui and Kwok (2008, 2009) that has to be considered as path-breaking, demonstrating that the inclusion of cultural factors in the set of explanatory variables greatly improves the predictive ability of regression analyses. Using an unbalanced panel data of 41 countries observed from 1976 to 2001, they include in their models four cultural variables introduced by Hofstede (1983, 2001): Individualism, Power Distance, Masculinity, and Uncertainty Avoidance. They find the first three variables to have a highly significant effect. The results prove to be robust, even after controlling for economic, institutional, and demographic factors such as GDP per capita, inflation, bank sector and stock market development, creditors rights, contract enforcement quality, dependency ratio, and religion. For instance, the inclusion of just one cultural variable, Individualism, increases the adjusted R2 from 0.70 to 0.83 — a highly significant improvement. Park et al. (2002) examine the impact of culture on insurance pervasiveness, defined as the combined penetration of life and non-life insurance.

Four of Hofstede's cultural dimensions are included in the panel regression analysis in addition to GNP, socio-political stability, and economic freedom.

In contrast with the life insurance demand studies of Chui and Kwok (2008, 2009), results show that only masculinity is positively correlated with insurance pervasiveness. This conflicting result may be due to the aggregation of life and non-life insurance, which may produce a bias against finding meaningful relationships if the impact of culture on insurance demand is different for life and non-life insurance. Also, Park et al. (2002) only have three other control variables in their regression model; they did not include life- or non-life-specific control factors. The low number of controls may cause an omitted variable problem and result in biased coefficient estimates.

It is essential to note that the results of those studies are limited to the specific countries and time periods analyzed and may not generalize to other countries or periods. Additionally, other factors, such as cultural differences, insurance regulations, and demographic factors, may also impact insurance demand in different countries and contribute to the observed differences between clusters. Further research is needed to fully understand the factors influencing insurance demand and determine whether these findings could be generalized to other countries and time periods. Overall, the results of this study highlight the complexity of the factors influencing insurance demand and the importance of considering multiple factors and their interactions to gain a comprehensive understanding of insurance markets.

## METHODOLOGY

For our research we focus on factors that determine demand of non-life insurance in 10 countries (Australia, France, Austria, Italy, Canada, Luxemburg, Danemark, Norway, Finland and Portugal) over the period of 1990 - 2021**.** In order to get more observations we used annual panel data for the target population cited above . Following similar approach that nearly every single international comparative study uses insurance density and penetration as dependent

variables, we use this measures as a demand for non-life insurance. These variables have the advantage of being easily available, annually, for a large number of countries. A disadvantage of density and penetration is that they add up premiums across various lines of insurance. In some countries motor insurance is the dominant non-life policy, while other nations emphasize more liability insurance. Aggregate premiums result in a loss of information, reducing the likelihood that significant explanatory variables will be discovered. Density and penetration measure slightly different effects. Penetration measures non- life insurance consumption relative to the size of the economy, while density compares non- life insurance purchases across countries without adjusting for income. High GDP countries will spend more on insurance in absolute terms, as they have more assets to protect. We therefore expect a very high correlation between insurance density and GDP – indeed one of the reasons for the paucity of research in determinants of non-life insurance may have been a belief that purchases are driven by wealth and little else. Penetration measures relative insurance consumption, as the overall wealth effect has been removed through division by GDP per capita. It measures how wealth is allocated to insurance in relative terms: two countries with similar GDP per capita may exhibit different insurance consumption patterns, an effect captured by penetration and not by density. For this reason we consider penetration to be our primary variable, and use density only for robustness checks.

Factors that we use as control variables, which may explain the demand of non-life insurance, include the following:

- Economic: GDP per capita, urbanization
- Demographic: level of education;
- Institutional: rule of law, control of corruption and government effectiveness, religion

**Table 1: Descriptive Statistics**

| Variable | Mean | Median | Minimum | Maximum | Std. Dev. |
|---|---|---|---|---|---|
| Non-life insurance penetration | 1,73947<br>143,319 | 1,700009<br>4,0000 | 0,330000<br>2,00000 | 4,77000<br>1012,00 | 0,871134<br>176,153 |
| Non-life insurance density | 6,76988 | 5,183004 | 0,321000 | 27,0330 | 5,46853 |
| GDP per capita | 45,2684 | 5,7000 | 0,300000 | 106,200 | 21,8586 |
| Urbanization | 10,9187 | 4,900002 | -3,70000 | 316,800 | 27,0337 |
| Education level | 256,550 | 59,000 | 29,0000 | 523,000 | 125,449 |
| Rule of Law | 20,7416 | 19,80003 | 7,30000 | 42,7000 | 7,77204 |
| Control of Corruption | 31,1435 | 87,00009 | 23,0000 | 45,0000 | 4,93403 |
| Government Effectiveness | 87,7225 | 3,0000 | 32,0000 | 136,000 | 31,4075 8 |
| Religion | | | | | |

Data are obtained from various sources. Non-life insurance penetration and non- life insurance density are obtained from Sigma, Swiss Re Economic Research & Consulting, Swiss Re, Zurich and national insurance associations. Education is obtained from EdStats, World Bank. Gini coefficients is obtained from World development indicators (WDI) database and Nation Master. GDP per capita and unemployment rate are obtained from World development indicators (WDI) database. Rule of law, control of corruption and government effectiveness is obtained from Worldwide Governance Indicators. Table 1 presents the descriptive statistics for all the variables used in the regressions.

**Economic Factors**

All previous studies, whether devoted to life or non-life insurance, conclude that income, measured as GDP per capita, is the most important factor affecting purchasing decisions (e.g Fortune, 1973, Campbell, 1980, Beenstock, Dickinson and Khajuria, 1986, Lewis, 1989, Outreville, 1990). Beck and Webb (2003), (Ward and Zurbruegg, 2000, Beenstock et al, 1988) point out a positive relationship in industrialized countries between national income and non-life insurance spending. Browne et al. (2000) analyzes general liability and motor vehicle insurance in OECD countries, and finds a significant positive relationship between premium density and GNP per capita. Additionally, (Esho et al, 2004) examines developed and developing countries between 1984 and 1998, and finds a strong positive relationship between national income and the non-life insurance premium. Outreville (1990) and (Ward and Zurbruegg, 2002) strongly emphasize that the insurance industry, through risk transfer, financial intermediation, and employment can generate externalities and economic growth. The larger is level of income, creates a greater demand for non-life insurance to safeguard acquired property. We expect income to have a strong, positive impact on non-life insurance demand.

Financial development should have a positive effect on the non-life insurance sector, and this effect could operate both from the demand and supply sides. For example, commercial banks expanding into mortgages and other personal loans (e.g. cars) could require the purchase of non-life insurance to approve these loans. Likewise, the greater availability of private fixed income instruments allowing higher spreads for insurers could motivate them to offer non-life policies at more attractive terms and increase sales of non-life products. It is not surprising, therefore, that most studies show a positive and significant effect of financial development. We also hypothesis positive correlation with non-life insurance demand.

The standard model of insurance demand specifies the demand function as a function of the premium (price) and the 'initial wealth' rather than income. It is well known that the optimal proportionate coverage is decreasing (constant) in the initial wealth if DRRA (CRRA)[1] when the initial wealth and the loss exposure are proportionate with each other and the loading factor is strictly positive, because the optimal insurance coverage choice problem can be reformulated as a static portfolio choice problem (Schlesinger, 2000). Since it is most likely that the preferences of the people exhibit DRRA or CRRA, the wealth elasticity of insurance demand should not be greater than unity as long as the loss exposure (insurable) is proportionate with the wealth level. But not only the level and size of the wealth but also the wealth distribution within a country may have an impact on the aggregate insurance demand; the aggregate insurance demand should be smaller when the wealth inequality is larger.

**Demographic Factors**

The level of education positively affects the demand for life insurance for several reasons. Namely, the primary motive for purchasing insurance is risk aversion to avoid loss. Schlesinger (1981) demonstrates that an individual with a higher loss probability, a higher degree of risk aversion, or a lower level of initial wealth, will purchase more insurance. Mayers and Smith (1990) believe that closely held firms are more likely to purchase insurance than firms with less-concentrated ownership for the same reason that an individual purchases insurance—risk aversion. Mayers and Smith (1990) further indicate a supposition that a company does not exhibit proper risk aversion, because risk aversion is not so obvious to the corporate purchasers

[1] DRRA and CRRA are decreasing and constant relative risk aversion, respectively.

of insurance. As stated previously, even though risk aversion could not perfectly explain why consumers would buy insurance, it is still an important indicator. Although risk aversion is a "rational" motive for an individual's purchase of insurance, unfortunately, it is difficult to measure. According to the discussion of (Browne and Kim, 1993), in general, a higher level of education may lead to a greater degree of risk aversion and greater awareness of the necessity of insurance. Nonetheless, (Szpiro and Outreville, 1988) proved the negative correlation between the level of education and risk aversion. They deemed that higher education leads to lower risk aversion, and that, in turn, leads to more risk-taking by skilled and well-educated people. When (Browne et al, 2000 and Esho et al, 2004) were discussing non-life insurance; they also took the level of education as a proxy for risk aversion.

On the other hand, the more people are involved in education process, the less labor force is presented on the market, therefore reducing overall GDP of the country. Therefore, education is hypothesized to be ambiguous related to non-life insurance demand. As an indicator of the level of education across countries we use tertiary gross enrollment ratio defined by the UNESCO Institute of Statistics as the total enrolment in tertiary education, regardless of age, expressed as a proportion of the eligible school-age population measure a country's level of education by its.

**Institutional Factors**

Political and legal stability is important for a vibrant and growing non- life insurance market. The more stable is the legal system and, therefore, a political system in the country the higher is the willingness of contracting parties to initiate the business relationships. To measure these institutional factors, we use three different indicators.

To measure property right protection, we use rule of law index, provided by The Worldwide Governance Indicators. This index reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. The legal system in force in a country may impact the development of insurance, as it specifies the liabilities of those responsible of damage, and defines the business environment of insurers (Browne et al, 2000). For instance, the United States leads the world in per capita consumption of liability insurance. The American legal system may be a contributing factor, by encouraging Americans to over-consume property-liability insurance (Syverud et al, 1994). Browne et al (2000) find the legal system to be a significant factor in the development of non-life insurance. Esho et al (2004) also investigate the impact of the legal system, but find it non-significant after controlling for income and property rights. Recently, (Park et al, 2010) showed that the use of a Common Law legal system is the most important determinant of toughness of bonus-malus systems in automobile insurance. Therefore, it is hypothesized a positive relationship with non- life insurance consumption.

To measure perceptions of the extent to which public power is exercised for private gain, we use control of corruption index also provided by The Worldwide Governance Indicators. This index, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Countries with little political and investment risk are more likely to have developed insurance markets, as the financial environment is more conducive to foreign investment, and financial contracts such as insurance policies are easier to enforce. As a measure of political stability, we use Government Effectiveness index indicator compiled by The Worldwide Governance

Indicators. He reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

These two institutional factors are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

**Religion**: Percentage of Individuals Who are Christian, Buddhist, or Muslim. Zelizer (1979) notes that, historically, organized religion is in conflict with the concept of insurance. Some observant religious people believe that reliance on insurance to protect one's life or property results from a distrust in God's protective care. Browne and Kim (1993) find Islamic beliefs to significantly decrease life insurance purchases. We expect countries with a high percentage of those who identified with established religion to have a lower degree of insurance consumption. This is especially true in Muslim countries.

**Other Factors**

**Urbanization:** Percentage of Population Living in Urban Areas (URBAN). Several authors suggest that Urbanization could be an important determinant for non-life insurance demand. Urban dwellers may perceive a higher risk of car accidents and thefts. The increasing rate of interaction among individuals in urban areas may increase loss probability and opportunities for crime and evading detection. Due to Urbanization, families become smaller and family protection disappears, so additional sources of financial security are needed. We expected the degree of Urbanization to have a positive impact. Interestingly, urbanization has a positive and statistically significant effect on non-life insurance expenditure in these countries.

Likewise, increasing urbanization leads to migration of people from rural to urban areas and, thus, uneven growth. In turn, this increases both the probability of loss and assets value at risks and results in greater demand for non-life insurance, which is confirmed by our regression results. Indeed, this finding is consistent with that in Esho et al. (2004), Outreville (1990) and Tiwari et al. (2019).

Given the cross-sectional and time-series data, we use country specific fixed effects panel data regression model with common coefficients across all cross-section members of the pool. The general equation to be estimated using pooled least squares is:

$$yit = \alpha i + xit\beta + uit\,, \qquad (1)$$

Where *yit* is a dependent variable, *xit* is a vector of independent variables, *uit* is a scalar disturbance term, *i* indexes country in a cross section, and *t* indexes time measured in years. Since the error terms *uit* are potentially serially correlated and heteroskedastic,

We propose an autoregressive process of first order: $uit = puit\text{-}1 + eit$, where *eit* is white noise. Model incorporates White's consistent covariance matrix (White, 1980), for dealing with heteroskedasticity.

Given the hypotheses specified above, we construct two separate panel data regression models. The models are different since non- life insurance demand is represented by two different dependent variables: Insurance penetration and insurance density.

The specifications of the models to be estimated are as under:

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**Model 1**

(non-life insurance penetration)it = αi + $\beta_1$(GDP per capita)it + $\beta_2$ (education level)it+ $\beta_3$ (urbanization)it + $\beta_4$(rule of law)it + $\beta_5$(control of corruption)it + $\beta_6$(government effectiveness)it+ β7(religion)it+ uit (2)

**Model 2**

(non-life insurance density)it = αi + $\beta_1$(GDP per capita)it + $\beta_2$ (education level)it+ $\beta_3$ (urbanization)it + + $\beta_4$(rule of law)it + $\beta_5$(control of corruption)it + $\beta_6$(government effectiveness)it+ β7(religion)it+ uit (3)

Before running the regression an Im, Pesaran and Shin, panel unit-root test, which is based on the Dickey-Fuller procedure was employed to test the stationarity of the variables in order to avoid the spurious regression. Im, Pesaran and Shin denoted IPS proposed a test for the presence of unit roots in panels that combines information from the time series dimension with that from the cross section dimension, such that fewer time observations are required for the test to have power. Since the IPS test has been found to have superior test power by researchers in economics to analyze long-run relationships in panel data, we will also employ this procedure in this study. IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \quad (4)$$

Where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

IPS use separate unit root tests for the $N$ cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the $t$-statistics for $p_1$ from the individual ADF regressions, $t_{iT_i}(p_i)$:

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT}(p_i \beta_i) \quad (5)$$

The *t*-bar is then standardized and it is shown that the standardized *t-bar* statistic converges to the standard normal distribution as N and $T \to \infty$. Im, Pesaran and Shin (1997) showed that *t-bar* test has better performance when N and T are small. They proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component.

The results of the unit root test are presented in Table2. While the null hypothesis of the unit-root was rejected for two of the thirteen variables, and they are stationary at their levels I (0); the obtained results indicate that there was a unit root in non-life insurance penetration, non-life insurance density, GDP per capita, urbanization, religion, level of education, rule of law, and control of corruption, government effectiveness.To solve the problem of non-stationarity, the series were differenced at first level I (1).

**Table 2: Panel Unit Root Test – Im, Pesaran and Shin (IPS)**

| Variable | Im, Pesaran and Shin Test | Order of Integration |
|---|---|---|
| Non-life insurance penetration | | |
| Non-life insurance density | 1,36877*** | I(1) |
| GDP per capita | 0,74027*** | I(1) |
| Urbanization | 0,65870*** | I(1) |
| Education level | 0,99383*** | I(1) |
| Rule of Law | 2,50097*** | I(1) |
| Control of Corruption | 1,0276*** | I(1) |
| Government Effectiveness | -1,30345*** | I(1) |
| Religion | -1,4268*** | I(1) |
| | 1,80903*** | I(1) |

## RESULTS

The models used in this study have been introduced in the last section. In this section, we present original results and interpretations concerning both of the observed models.

### Non-Life Insurance Penetration

Main regression results from non-life insurance penetration across countries are presented in Table 3. In column (1), only economic variables were used. As we expected, the GDP is positively and statistically significantly associated with non-life insurance penetration in all models. The coefficient in first column implies that a 1-percent increase in the GDP is associated with a 0, 20 percentage points increase of non-life insurance penetration.The regression confirms our expectation that there is a significant and optimistic correlation between the concentration of GDP and intake of non- life insurance.

Urbanization rate have an expected positive sign, suggesting that urban dwellers may perceive a higher risk of car accidents and thefts. The increasing rate of interaction among individuals in urban areas may increase loss probability and opportunities for crime and evading detection. Due to Urbanization, families become smaller and family protection disappears, so additional sources of financial security are needed. We expected the degree of Urbanization to have a positive impact.

Likewise, increasing urbanization leads to migration of people from rural to urban areas and, thus, uneven growth. In turn, this increases both the probability of loss and assets value at risks and results in greater demand for non-life insurance, which is confirmed by our regression results. Indeed, this finding is consistent with that in Esho et al. (2004), Outreville (1990) and Tiwari et al. (2019).

Column (2) includes demographic variable such us the education level. The adjusted R-square increases by 6.9%. The result from education variable in column 2 and 3 means that the higher the level of education, the greater the demand for insurance. The regression coefficient was strong statistically significant This corresponds to the prior research of Browne and Kim (1993), which showed that a high level of education leads to high risk aversion and these people would buy more insurance.

Column (3) covers institutional factors rule of law, control of corruption and government effectiveness and religion.

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The results in these column indicate that out of our three indicators of institutional quality only rule of law is positively and and statistically significantly correlated with non-life insurance penetration. The coefficients on the control of corruption and government effectiveness and religion are negatively and statistically significantly correlated with non-life insurance penetration.

Column (4) summarizes the full model that includes all variables. The inclusion of all variables does not change the fact that the most important factors that determine the demand for non-life insurance in the analyzed countries are the GDP, the education level, urbanization and the rule of law and religion which are positively and statistically significantly associated with non-life insurance penetration in all models. Of the remaining variables GDP, education level, rule of law and religion are significant at 5% level. Only urbanization variable was positively and statistically associated with non-life insurance penetration. All others variables was negatively and statistically significant which are control of corruption and government effectiveness.

**Table 3: The Determinants of Non-Life Insurance Penetration**

| Variable | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Constant | 0,0251249<br>(0,8159) | 0,0295937<br>(1,0486) | 0,0229237<br>(0,7834) | 0,0275194<br>(0,9941) |
| GDP per capita | 0,0152232**<br>(0,6260) | 0,0106662**<br>(0,4679) | 0,0116447**<br>(0,5356) | 0,0089201**<br>(0,4146) |
| Urbanization | 0,00261871***<br>(0,5774) | 0,0017379***<br>(0,4466) | 0,00252426***<br>(0,6109) | 0,00181208***<br>(0,4864) |
| Education level | 0,00203844 **<br>(2,1240) | 0,00359153** | 0,00132372** | 0,00288788** |
| Religion | 0,00603851**<br>(0,7667) | (3,1930) | (1,4673) | (2,5521) |
| Rule of Law | 0,0377655**<br>(4,2358) | 0,00359451** | 0,00450922** | 0,00157536** |
| Control of Corruption | | (0,5013) | (0,6019) | (0,2232) |
| Government Effectiveness | | 0,0331908** | 0,037036** | 0,0332313** |
| | | (4,1166) | (4,1026) | (3,8931) |
| | | -0,0122287*** | | -0,00323164*** |
| | | (-0,8035) | | (-0,1552) |
| | | -0,033024*** | | - 0,0277266** |
| | | (-2,9547) | | (-2,6010) |
| Observations | 320 | 320 | 320 | 320 |
| Adjusted R-square | 0.6989 | 0.7067 | 0,784133 | 0.9365 |
| Durbin-Watson | 1,843679 | 1.72536 | 1. 698321 | 1.9852 |

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Numbers in brackets show t-values.

## Non-Life Insurance Density

The results in Table 4 indicate that the GDP per capita, urbanization, religion, education level and rule of law explain the variation in non-life insurance density across countries.

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These results are very similar to the ones obtained for non-life insurance penetration, so that in the following we will concentrate on the differences.

Non-life insurance density increases with GDP per capita. This result is larger and statistically significantly than for non-life insurance penetration and is the more robust variable in the regression. Even when we includes demographic and institutional variables, we find that the GDP per capita enters at the 5% significance level. This finding is consistent with the differences between the two indicators of non- life insurance consumption, as explained in section 3.

As in the case of non-life insurance penetration, urbanization, religion, education level and rule of law can explain positively variation in non-life insurance density across countries. Countries with higher urbanization levels, higher education level, Christian or Buddhist beliefs and more effective rule of law spend more on non- life insurance than other countries. The control of corruption and government effectiveness explain negatively variance in non-life insurance density.

**Table 4: The Determinants of Non- Life Insurance Density**

| Variable | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Constant | 0,522994 | 0,223705 | 1,12016 | 0,458126 |
| | (0,1385) | (0,0684) | (0,2899) | (0.0123) |
| GDP per capita | 20,0554*** | 19,3034*** | 20,1357*** | 20,1748*** |
| | (7,1519) | (7,3562) | (8,2856) | (8,2865) |
| Urbanization | 0,133134** | 0,0143009** | 0,159535*** | 0,0581067** |
| | (0,2494) | (0,0349) | (0,3604) | (0,0223) |
| Education level | 0,292646** | 0,552201** | 0,077379*** | 0,295892** |
| | (2,7469) | (4,3811) | (2,3652) | (2,0858) |
| Religion(%Christian) | | 0,13114** | 0,787316*** | 0,213096** |
| | | (0,1659) | (0,8447) | (0,2628) |
| Religion(%Muslim) | | | 0.02113 | |
| | | | (4.8976) | |
| Rule of Law | 3,10027** | 2,33632** | 3,32207 *** | 2,82271** |
| | (2,7675) | (2,3365) | (3,153) | (2,8450) |
| Control of Corruption | | | -2.5621*** | -2.2145*** |
| | | | (-0.4529) | (-0.6524) |
| Government Effectiveness | | | -1.1256*** | -1.5326*** |
| | | | (-2.2436) | (-1.7896) |
| Observations | 320 | 320 | 320 | 320 |
| | | 0.7594 | 0.8325 | 0.9365 |
| Adjusted R-square | 0.6943 | 2.3214 | 2.5423 | 2.0213 |
| Durbin-Watson | 1.2533 | | | |

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Numbers in brackets show t-values.

We use Huber-White's estimators in our tests to allow for possible heterogeneity in the error structure. Independence is still assumed but observations may have different variance. Year dummies proved to be consistently insignificant and are included but not reported in all tables. In column (1), only economic and institutional variables were used. An adjusted Rsquare coefficient of 0.694 results from the very strong influence of GDP, rule of law, higher urbanization levels, and education level .Signs of regression coefficients all conform to our predictions: a higher income per capita, a high level of education, higher urbanization levels,

and the use of a Common Law legal system, all lead to highly significant increases in non-life insurance demand. Column (2) includes our first cultural variable, percentage of Christian or Buddhist beliefs, which demonstrates the powerful positive effect of Christian or Buddhist beliefs in insurance. The adjusted Rsquare increases by 8.5% following the addition of this single variable. The percentage of the population with Muslim beliefs did not prove to have a significant impact, so we excluded this religious variables from our base regression model and provide full regression result as a robustness check in Column (3).

Column (3) includes in the model specification the two institutional variables which are control of corruption and government effectiveness. All the two variables are significant at the 1% level, with regression coefficients signs according to predictions. Control of corruption and Government Effectiveness has a negative impact on non-life insurance sales.

Column (4) summarizes the full model that includes significant cultural variables: Christian or Buddhist beliefs percentage which is significant at the 1% level.

Given the high correlation between several economic / institutional variables, a more parsimonious model is presented in column (4): GDP/capita, urbanization, education level, rule of law, control of corruption, government effectiveness and Christian or Buddhist beliefs. The adjusted R-square is the most significatif compared to the others 3 models.

**Implications and Conclusions**

The paper's main aim was to analyze the dependence between non-life insurance demand represented by non-life insurance penetration, density and various factors from economics, finance, socio-demographics, and institutions.

This paper analyzed the determinants of non-life insurance consumption in a panel regressions sample of 10 countries over the period 2000-2021. We used two different indicators of non-life insurance, non-life insurance penetration, non-life insurance density.

Consistent with previous research, we find that non-life insurance penetration and non-life insurance density increase with higher per-capita income. We find that GDP per-capita is statistically significantly in both non-life insurance density and in non-life insurance penetration.

From the demographic factors we find that higher level of education lead to a higher non-life insurance penetration and higher non- life insurance density. This finding suggests a need for elevating the education level of population. It would be useful to enhance the understanding of financial products presented on the market and possible benefits from using them by potential consumers.

The results from institutional factors underline the importance of rule of law in non-life insurance penetration and non-life insurance density. The coefficients on other institutional factors such the control of corruption and government effectiveness are negatively significant.

Our analysis also yields a number of policy implications. Notably, governments can develop the non-life insurance sector through policies that support urbanization. Similarly, ensuring an environment that promotes economic freedom (such as low tariff, high personal choice, low government spending and high security of property rights) could be an effective way of promoting non-life insurance demand. In contrast, policies that help to reduce the rate of urbanization may yield a double dividend: less population and congestion in cities

and better opportunities for the development of non-life insurance markets. Also, countries with high level of education, can develop the development of non- life insurance demand.

Among many socio-economic factors such as income, urbanization and education level, our analysis suggests that cultural dimensions such as beliefs and rule of law play a role. For instance, these non-life insurance companies can enlarge their business in countries where the rule of law is well practiced and for Christian or Buddhist beliefs.

Further research is needed to fully understand the factors influencing insurance demand and determine whether these findings could be generalized to other countries and time periods. Overall, the results of this study highlight the complexity of the factors influencing insurance demand and the importance of considering multiple factors and their interactions to gain a comprehensive understanding of insurance markets.

The findings of the paper may be useful for non-life insurance companies seeking to expand existing markets and/or finding newly potential markets. More importantly, the paper provides policy recommendations that may help policymakers across countries to frame appropriate regulations to grow the non-life insurance sector, which is an important engine for economic growth.

Our findings may be valuable to researchers and practitioners in the field of international finance as well as insurance companies doing business around the world. Most importantly, they suggest that cultural factors that often get overlooked in studies of life insurance markets need to be investigated more thoroughly. Finding a proper proxy for the cultural component in those regions would help insurance companies better understand the cultural specifics and the potential of a particular country's market for non-life insurance, and our study is a step in that direction. Of course, no empirical study can explain everything. In a study of non-life insurance, it is especially true since there are numerous factors that are hard to quantify. In our future research, we plan to explore the importance and relevance of cultural proxies using a larger sample of countries. Other directions for further research include a more in-depth look at the effect of dependency ratio on non- life insurance purchases and possibly disentangling supply-side and demand-side effects on the overall amount of non-life insurance purchased.

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