Unpacking the Role of Socioeconomic Factors in Insurance Inclusion: Evidence from The E-7 Countries

Sigorta Kapsamasında Sosyoekonomik Faktörlerin Açıklanması: E-7 Ülkelerinden Kanıtlar

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ABSTRACT

In this study, the socioeconomic factors determining the insurance inclusion variable, constructed using principal component analysis, were tested using the Parks-Kmenta estimator and quantile regression for the E7 countries. In this context, the data used in the study were obtained between 2004 and 2017, depending on the accessibility of the variables. The empirical results show that while inclusion in the insurance sector is positively influenced by macroeconomic factors such as economic growth, sustainable development, urbanization, and public expenditure variables, it is negatively affected by risk components such as global uncertainty and political risk. Thus, the results suggest that socioeconomic factors significantly influence involvement in the insurance sector. In addition, thanks to financial inclusion, the revival of E7 countries will be ensured, and the growth of the economies of these countries will accelerate.

KEYWORDS

Insurance Inclusion, Economic Factors, Panel Data Analysis, E-7 Countries

ÖZ

Bu çalışmada, temel bileşenler analizi kullanılarak oluşturulan sigorta kapsama değişkenini belirleyen sosyoekonomik faktörler, E7 ülkeleri için Parks-Kmenta tahmincisi ve niceliksel regresyon kullanılarak test edilmiştir. Bu kapsamda çalışmada kullanılan veriler, değişkenlerin erişilebilirliğine bağlı olarak 2004-2017 yılları arasında incelenmiştir. Ampirik sonuçlar, sigorta sektörüne dahil olmanın ekonomik büyüme, sürdürülebilir kalkınma, kentleşme ve kamu harcamaları değişkenleri gibi makroekonomik faktörlerden pozitif yönde etkilenirken, küresel belirsizlik ve politik risk gibi risk bileşenlerinden negatif yönde etkilendiğini göstermektedir. Dolayısıyla, sonuçlar sosyoekonomik faktörlerin sigorta sektörüne katılımı önemli ölçüde etkilediğini göstermektedir. Ayrıca finansal kapsayıcılık sayesinde E7 ülkelerinin canlanması sağlanacak ve bu ülkelerin ekonomilerinin büyümesi hızlanacaktır.

ANAHTAR KELİMELER

Sigorta Kapsama, Ekonomik Faktörler, Panel Veri Analizi, E-7 Ülkeleri

Makale Geliş Tarihi / Submission Date 14.08.2023	*Makale Kabul Tarihi / Date of Acceptance* 25.10.2023
Atıf	Doğan, E., Doğan Başar, B. ve Ekşi, İ. H. (2023). Unpacking the Role of Socioeconomic Factors in Insurance Inclusion: Evidence from The E-7 Countries. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi*, 26 (2), 436-450.

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INTRODUCTION

The contribution of financial development to reducing poverty, increasing social welfare, improving unequal income distribution, and ensuring inclusive and sustainable development has been explored in various studies (Humanicki and Olszewski, 2020). The concept of financial development is mainly discussed in terms of three different definitions: Financial Access, Deepening, and Inclusion.

Due to their impact on financial systems and the economy, financial inclusion issues have recently attracted increasing attention from researchers, policymakers, and practitioners. As a result, studies are being conducted in many countries to develop strategies to improve the inclusion of low-income and disadvantaged groups in the financial system. These efforts are also supported by various international organizations, including the International Monetary Fund (IMF) and the World Bank (Pradhan et al., 2016; Sarıgül, 2021).

The factors that influence the financial inclusion level can be supply or demand-driven. For example, socioeconomic factors and individuals' perceptions and attitudes toward economic issues are supply-side factors. Demand-side factors include socioeconomic and technological factors such as income, education level, age, gender, transportation, and telecommunications (Başar et al., 2018; Abel et al., 2018).

Economic factors are among the most important determinants of financial inclusion. Many studies show a positive and significant relationship between financial inclusion and economic development, showing that unemployment, poverty, and income inequality negatively affect access to and use of financial services (Bittencourt, 2012). It has been observed that financial inclusion has increased in high-income countries (CBRT, 2020).

One of the essential elements of the financial system is the insurance sector. Since the insurance sector is a sector that influences and supports other areas of activity in the economy, it serves to promote financial inclusion. It has long been assumed that the activities of the insurance market support economic growth through the role of the financial intermediary in mobilizing long-term funds for financial markets (Alhassan and Biekpe, 2016; Pradhan et al., 2016). The relationship between insurance and economic growth is essential for developing countries, which are the study's sample, as it affects the economy (Games and Nabi, 2021). As a mechanism for transferring the financial risk of loss, insurance performs several valuable economic functions that benefit policyholders and society. Insurance companies accelerate the growth of financial markets by making long-term investments with long-term cash flows.

The sector provides leverage against adverse macroeconomic shocks that significantly slow economic activity. Providing financial protection to households and all segments of society involved in economic activity reduces uncertainty about the macroeconomic environment, and the security and stability of the community as a whole are ensured to some degree. As a result, a more favorable environment for doing business is created as investors prefer less uncertain macroeconomic markets (Pradhan et al., 2016; Okonkwo and Eche, 2019; Olarewaju and Msomi, 2021). In addition to the challenges facing the insurance market, there are several risks. Global issues include climate change, natural disasters, cyberattacks, geopolitical changes, and changing customer behavior. These risks also affect developing countries, the companies that insure these changes, and the relevant regulators. Therefore, the insurance industry's sustainability is paramount to any economy. Both market power and efficiency contribute to the viability of insurance (Chuang and Tang, 2015).

On the other hand, the industry can adjust the behavior of trading companies through risk-based insurance premiums. As intermediaries of long-term investments, insurance companies can play a crucial role in the sustainability of long-term financing and better cost management (Olarewaju and Msomi, 2021). The industry also mitigates the impact of significant losses on businesses and families. Thus, it reduces the capital required for personal financing of losses and promotes higher production, spending, innovation, and competitiveness (Asongu and Odhiambo, 2021).

Studies on the insurance sector are generally divided into two categories: Life and non-life insurance. The long-term nature of life insurance policies allows the funds obtained from life insurance to be used through the intermediation of financial intermediaries and markets. This feature makes life insurance an alternative source of internal funds mobilization for emerging economies that traditionally rely heavily on external grants and loans for budgetary support (Alhassan and Biekpe, 2016). As a result, the demand for life insurance has increased substantially in recent decades, especially in developed countries. However, most developing countries' demand for life insurance remains low (Outreville, 1996).

There is extensive literature examining the drivers of non-life insurance spending. Typical determinants include economic factors such as income and standard of living (Browne and Kim, 1993; Dragos, 2014; Zerriaa and Noubbigh, 2016; Olarewaju and Msomi, 2021), as noted in previous studies, and social factors such as education, economic freedom, and legal environment (Dragos, 2014; Pradhan et al., 2016; Olarewaju and

Msomi, 2021; Alhassan and Biekpe, 2016). For example, Lee (2007) found that income plays a role in the purchase of insurance. Browne and Kim (1993) identified income, insurance prices, inflation, government social protection, dependency ratio, and religion as essential determinants of life insurance in their 1987 study using a sample of 45 countries. In addition, some studies examine the relationship between inflation rate and insurance; others show the relationship between institutional quality and insurance, and others discuss the relationship between urbanization and insurance. In addition, some studies examine the relationship between the inflation rate and insurance (Browne and Kim, 1993; Olarewaju and Msomi, 2021); some studies show the relationship between institutional quality and insurance (Alhassan and Biekpe, 2016); some studies examined the relationship between urbanization and insurance (Sen and Madheswaran, 2007; Dragos, 2014).

The primary motivation for this study is the gap in the literature on insurance inclusion. In other words, the topic of financial inclusion has been explored in the literature to the extent that it has been researched; however, the issue of insurance inclusion has not been explored for a limited time. This study attempts to determine the relationship between the political risk index, sustainable development index, world insecurity index, urbanization level, public expenditure, GDP, and insurance inclusion of the observed countries. A limited number of studies examine these factors impact on the insurance industry (Canh et al., 2021; Nguyen et al., 2020). This study differs from the other studies regarding the countries included in the analysis and the methodology. As mentioned earlier, similar studies have looked at the insurance sector separately for life and non-life insurance. In this study, however, no such distinction was made to address inclusiveness in the insurance sector with a holistic approach to access and use of insurance services.

Identifying the explanatory factors for inclusion in general, particularly in the developing countries that comprise the study sample, will support policy decisions to improve financial inclusion, taking into account the unique characteristics of the countries. For example, the E-7 countries (short for "Emerging 7"), which include China, India, Brazil, Turkey, Russia, Mexico, and Indonesia, were selected as the sample because informal saving and borrowing are widespread in developing countries. In addition, the relationship between people's attitudes toward insurance in developing countries and the above independent variables has been little studied in the literature. Another reason for selecting the E-7 countries for the study was the unequal financial access of people in these countries. Furthermore, the socioeconomic status of the E-7 countries varies widely (Yang et al., 2022). Therefore, different factors may be responsible for insurance efficiency in these countries.

This paper is organized as follows. After this introductory section, Section 2 reviews previous research on this topic. Section 3 deals with the definition of the variables under consideration. Section 4 presents the model, the data set, and the methodology used in this study. Section 5 presents the empirical results of the analysis, and Section 6 concludes the research that should be conducted as part of this study.

1. LITERATURE

The literature examining the relationship between the institutional quality of a country and the attitudes of that country's citizens toward insurance is quite extensive. Centreville (2007, 2008) found that the average corporate rate strongly influences attitudes toward finance and insurance. Similarly, Balcilar et al. (2020) concluded that institutional quality increases insurance premiums. Alhassa and Biekpe (2016) argue that institutional quality increases the demand for life insurance.

Another factor that may be relevant to insurance inclusion is the concept of uncertainty. The complex relationship between global economic uncertainties and the financial system became even more apparent during the 2007-2009 global financial crisis (Baker et al., 2016). To address this gap, Ahir et al. (2018) created the World Uncertainty Index (WUI), which reflects the frequency of the word "uncertainty" (and its variants) in country reports. However, studies on the relationship between uncertainty and the financial sector mainly focus on the impact of uncertainty on the banking system (Baum et al., 2013; Bordo et al., 2016). Studies focusing on the effects of global economic uncertainty on the insurance industry are pretty limited. Lee et al. (2013) have shown that reducing economic risks reduces the elasticity of insurance demand. Since global economic uncertainty is a class of economic troubles and economic risks affect insurance demand (Lim and Haberman, 2003), it is very likely that the worldwide uncertainty index also affects insurance inclusion. Yenisu (2019) found a statistically significant relationship between the insurance sector and economic growth in the long and short term. Akpinar and Yizdiz (2018), Balcilar et al. (2020), and Gupta et al. (2019) have discussed the impact of global economic uncertainty on the insurance industry. In all three studies, Akpinar and Yizdiz (2018), Gupta et al. (2019), and Balcilar et al. (2020) observed the impact of uncertainty on the insurance industry.

Studies on the impact of the urbanization process on insurance are increasing daily. In this context, Akhter and Khan (2017) and Lee et al. (2017) found a positive and significant relationship between urbanization and

individuals' attitudes toward insurance. The literature also discusses the impact of economic freedom on the insurance sector (Lee et al., 2018; Trinh et al., 2020). Kjosevski (2012) studied economic freedom and individuals' attitudes toward insurance. As a result of the study, a positive and significant relationship was found between these two variables. Trinh et al. (2016) argue that higher economic freedom and income increase both wealth and the value of risky assets, but they find that this increases insurance demand. Gong and Chen (2023) show that the current insurance reform in China lags behind the pace of in situ urbanization.

Zyka and Myftaraj (2014) found that population size and urbanization positively affect total insurance premiums. Sener and Behdioğlu (2014) determined that changes in inflation rates, population numbers, and number of insurance companies positively affected total insurance premium production in Turkey. Trinh et al. (2016) examined the variables determining non-life insurance spending. The results show that insurance includes income, bank performance, economic freedom, urbanization, and culture. On the other hand, Muhtar and Agboola (2021) examined the relationship between insurance and economic development, urbanization, and economic freedom. They found that these variables positively and significantly affect people's attitudes toward insurance. Polat and Faruk (2021) argue that financial development is essential to life insurance. The increasing complexity of the financial structure negatively affects life insurance.

People's attitude toward insurance indicates a country's economy and sustainable development (Melnychuk et al., 2019). Canol (2018) compared the data received from Turkey and the world countries in the life insurance branch, and it is seen that the Turkish insurance sector is in a weak position, especially in the life insurance branch. Enz (2000) shows that as economic development increases, the demand for life insurance increases, but when the country's economic level reaches the level of a developed country, the demand for life insurance slows down. Ward and Zurbruegg (2002) examined the relationship between economic development and life insurance demand in their study. The result of the study showed that economic development does not influence demand decisions for life insurance. However, Lee and Chiu (2012) found that the impact of economic development on insurance premiums has recently become more critical.

Moreover, in gendered languages, speakers must constantly distinguish between women and men, making gender a more important category for themselves. Osei-Tutu and Weill (2021) have shown that this aspect of language hinders women's participation in economic activities and the financial inclusion of individuals. Uckun and Ersoy (2021) found that the increase in Turkey's geopolitical risks caused per capita life insurance premiums to decrease in Turkey in the long run. This negative impact of the increase in geopolitical risks on life insurance also shows that life insurance is a secondary need in Turkey. In addition, economic growth positively affects life insurance premiums per capita. Likewise, Yildirim (2022) found that economic growth positively affects insurance sector premium production, and likewise, insurance sector premium production is the cause of economic growth.

Many studies attempt to empirically establish a relationship between macro and socioeconomic variables and individuals' attitudes toward insurance. While the present study differs from these articles in the literature in its main components, such as variables and research hypotheses, the main difference is that in the study, the two branches of insurance are examined under a single umbrella. Considering the above differences and the sample diversity, the study is expected to contribute to the literature.

2. MODEL, DATASET AND METHODOLOGY

2.1. Data Set

The stark reality is that most poor people still lack access to sustainable financial services, whether in savings, credit, or insurance. The major challenge is removing barriers that exclude people from full participation in the financial sector. This study empirically examined the factors that influence inclusion in the insurance sector in the E-7 countries and their effects. In this context, the data used in the study were obtained from 2004 to 2017, depending on the accessibility of the variables. The insurance inclusion index (ii) was constructed in the study to represent insurance inclusion.

In contrast, the relationship between the insurance sector and the factors affecting insurance inclusion for the E-7 countries was investigated. In reviewing the literature on the index in question, it was found that different studies use insurance inclusion indices and related indicators depending on their objectives. In addition, when examining the literature review, it was found that life and non-life insurance are treated separately. Therefore, unlike other studies in the literature, this study constructs an insurance inclusion index using the indicators obtained from the data on insurance inclusion indicators.

The indicators discussed in the study are listed in Table 1.

Table 1: Indicators Used to Build Insurance Inclusion Index

Indicators	Source From
Life Insurance Volume/GDP (%)	World Bank- Financial Structure Database
Non-life Insurance Volume/GDP (%)	World Bank- Financial Structure Database
Insurance and financial services (percentage of commercial services exports)	World Bank- WDI
Insurance and financial services (share of service imports in the Balance of Payments)	World Bank- WDI
Number of Insurance Companies Per 100 Thousand People	IMF- FAS Database
Financial Development Index	IMF- FAS Database

The definitions of the analyzed variables, their sources, and expected signs are given in Table 2.

Table 2: Variables and Explanations

Variables	**Defining Variables**	**Source From**	**Expected Sign**
II	Insurance Inclusion Index	Calculated by the Authors	
GDP	Economic Growth Rate (%)	World Bank- WDI	+
Policy	Political Risk Index	Calculated by the Authors	-
WUI	The World Uncertainty Index was used to represent uncertainty.	https://worlduncertaintyindex.com/data/	-/+
SDI	Sustainable Development Index	https://www.sustainabledevelopmentindex.org/	+
Urban	Growth Rate of Urban Population (%)	World Bank- WDI	+
Government	Share of public expenditures in GDP (%)	World Bank- WDI	+

Index of insurance inclusion

The index for the E-7 countries was calculated by considering various indicators of accessibility and usage of insurance services with a holistic approach. Because the insurance inclusion index represents the degree to which all individuals in the economy are included in the system of insurance services and can benefit from all the opportunities that the system offers, it is central to the economy and the financial system because it encourages long-term investment in the financial markets and provides individuals with insurance services and the ability to protect their investments and assets. Therefore, the insurance sector must be inclusive for sustainable growth, meaning households can access insurance services (Canh et al., 2021). In this context, the provision of insurance inclusion is expected to significantly contribute to achieving inclusive growth in the E-7 countries, whose capital and financial markets are overgrowing and have significant value in terms of economic size.

Urbanization

It is now common knowledge that any society wanting to develop tries to increase the degree of urbanization, and this urbanization affects the lifestyle and preferences of individuals. Along with urbanization, emerging problems and the tendency of individuals to buy insurance have increased the need for insurance (Lin et al., 2011). In this context, there is expected to be a linear relationship between the urbanization variable used in the study and insurance inclusion (Wen and Wallace 2019).

Sustainable Development Index

The Sustainable Development Index, an index for calculating the ecological efficiency in ensuring nations' human development, consists of the Human Development Index and the Ecological Impact Index (sustainabledevelopmentindex.org, Jan. 22, 2022). As a risk assurance mechanism, insurance helps countries achieve their sustainable development goals regarding economic growth, social inclusion, and environmental protection (Akyol and Gül, 2021). From this point of view, one might expect the relationship between insurance inclusion and the sustainable development index to be linear.

World uncertainty index

To assume higher risks due to increased uncertainty, an increase in insurance activities is inevitable, and there is strong evidence that the uncertainties of the economic world strongly influence insurance activities (Balcilar et al. 2020). Therefore, the global uncertainty index variable is predicted to increase insurance inclusion.

Political Risk Index

Political Risk Index: It is based on six key components: political stability and non-violence, freedom of expression and accountability, quality of regulation, government effectiveness, the rule of law, and corruption prevention. At the top of the list of factors affecting countries' economic development, these components are ranked on a scale of 0 to 100 (Kaufmann et al., 2010). Since legal differences and distrust of the judiciary and the financial system affect individuals' attitudes toward insurance, it is inevitable to say that a country's political risk affects individuals' inclination toward insurance (Laura et al. 2016). From this point of view, a linear relationship is expected between insurance inclusion and the political risk index.

Public spending as a share of GDP and the economic growth rate were included as control variables. They were assumed to influence the economic indicators of the countries and, consequently, citizens' willingness to purchase insurance.

2.2. Method

Principal Component Analysis (PCA) was applied in the context of the selected indicators to determine the relative importance of the insurance sector inclusion indicators and to construct an insurance inclusion index for the E-7 countries. The PCA method allowed the development of a set of k unrelated variables using the relative weights of a group of p indicators related to each other. A new data set was created by reducing the size in the first stage. In the second stage, unrelated principal components calculated scores using related indicators (Johnson and Wichern 2002, Tatlıdil 2002, Ozdamar 2010). Finally, the insurance inclusion index was calculated by ranking each principal component using the weights of its scores.

Given the intense discussions on the impact of country risk on financial markets, the political risk components of the International Country Risk Guide (ICRG) were included in the study by creating an index of political risk and the index of insurance coverage created by the principal component analysis. Political risk components such as democratic accountability and freedom of expression, political stability and absence of violence, government effectiveness, quality of regulation, law and order, and control of corruption were analyzed using the principal component analysis method. In addition, the index of global uncertainty was included in the analysis to determine the impact of increasing uncertainties in the insurance sector on the use of insurance. On the other hand, the variables used in the study are economic growth rate, sustainable development index, urbanization rate, and public expenditure as a percentage of GDP, which is assumed to impact insurance utilization (Table 2).

These are the variables commonly used in studies on this topic in the literature (Balcilar et al. 2020; Wen and Wallace 2019; Laura et al. 2016).

Factors determining inclusion in the insurance sector in the E-7 countries were analyzed using the Parks-Kmenta Estimator and the Quantile Regression method. Among these methods, the Parks-Kmenta estimator is a method that gives reliable results in cases such as changing variance, autocorrelation, and cross-section

dependence in the panel data set used. Moreover, the Parks-Kmenta organized model can achieve robust standard errors without sacrificing parameter estimates. From this point of view, this chosen method has been developed to reach effective and consistent estimates even in case of potential problems. On this basis, the Parks-Kmenta model structure was determined in equation 1 (Kmenta, 1986: 615),

$$y_{i,t}=\alpha_i+\sum_{k=2}^{k} \alpha k x_{kit}+u_{it} \quad (1)$$

The quantile regression method was used in the study in terms of robustness in determining the factors affecting insurance inclusion, as it is one of the preferred methods for eliminating problems such as heteroskedasticity. Moreover, due to its nonparametric nature, quantile regression was suitable for analyzing data with different error distributions. As is well known, the sum of squares of errors is minimized in the least squares regression estimation used in classical analysis. In addition, depreciation of other values may be possible instead of the error squares. In such a case, alternative regression models are used (Özel and Sezgin, 2012: 292). The quantile regression method considers the estimated changes for the entire distribution of the dependent variable. That is, it allows different effects of the independent variable on various points of the distribution of the dependent variable (Mcmillen, 2013: 1).

Because of its nonparametric nature, the quantile regression method was a valid alternative for analyzing data characterized by various error distributions. It was also influential in eliminating the heteroskedasticity problem because of its early applications. The method in question differed from traditional regression models in its emphasis on distributions and was, therefore, more suitable for analyzing changes in the distribution of the dependent variable. The quantile regression model was a setup model. A simple setup model is described below.:

$$Y_t = \beta + e_t \quad (2)$$

Y_t Equation 2 is an independent, identically dependent, β-median random variable with a symmetric distribution function F. In the model estimated with the help of equation 2, θ. The sample quantile is,

$$min_\beta \frac{1}{n}\left\{\sum_{i:y_{i\geq\beta}} \theta\lceil y_i-\beta\rceil + \sum_{i:y_{i<\beta}}(1-\theta)\lceil y_i-\beta\rceil\right\} \quad (3)$$

It is obtained by minimizing Equation 3. This linear regression model,

$$y_i = x_i'\beta + e_i \quad (4)$$

Based on the sign of the θ the quantile regression observation values;

$$\theta min_\beta \frac{1}{n}\sum_{i=1}^{n}(\theta-\frac{1}{2}+\frac{1}{2}sgn(y_i-x_i'\beta)(y_i-x_i'\beta)) \quad (5)$$

It is estimated that sgn(a) is the sign of a and takes the value '1' if it is positive and '-1' if it is negative or zero. The fact that the estimates are based on the signs of the observation values rather than the size of the observation values makes the quantile regression a robust method (Özel and Sezgin, 2012: 293).

3. EMPIRICAL FINDINGS

3.1. Principal Components Analysis Results

In the study, using the principal component analysis (PCA), the insurance inclusion index (II) had to be constructed considering the insurance inclusion indicators in Table 1. On the other hand, the principal component analysis (PCA) method had to be applied in the context of the political risk indicators (democratic accountability and freedom of expression, political stability and absence of violence, government effectiveness, quality of regulation, law and order, and control of corruption) in constructing the political risk (policy) index variables. Therefore, before moving on to model estimation in the study, a single index was created with the help of the PCA method, using six insurance coverage indicators and six selected political risk indicators. With the help of Principal Component Analysis, it is necessary to determine the suitability of the data used for factor analysis in creating the insurance inclusion index and political risk index. For this purpose, the Kaiser-Meyer-Olkin (KMO) and Bartlett tests were used. In the second stage, if it was determined that the data was suitable for factor analysis, how many components there would be according to the size of the variance explained between the variables was determined. The factor score (weights) calculated by Principal Components Analysis were then taken and multiplied by the relevant variable, and then all of these were added. As a result, the insurance inclusion index and political risk indexes were obtained after the mentioned stages.

Before creating the indices, checking whether the selected indicators were suitable for principal component analysis was necessary. Field (2000) states that the lower limit for the Kaiser-Meyer-Olkin test value should be 0.50. Therefore, it can be said that the selected indicators cannot be used for principal component analysis if the KMO test value in question is ≤0.50. Therefore, the principal component analysis method is suitable if

the KMO value is greater than 0.50 and the Bartlett test is significant. The corresponding results of the Bartlett test and the Kaiser-Meyer-Olkin test are shown in Table 3.

Table 3: Results of Kaiser-Meyer-Olkin and Bartlett Tests

	II		Policy
Kaiser-Mayer-Olkin (KMO) Sample Measurement Value Adequacy Test	0.59		0.55
Barlett Test	Chi-Square	1103.675	94.57
	Prob.	0.00	0.00

The test results in Table 3 show that the KMO test score for the insurance inclusion index is 0.59, while the score for the political risk index is 0.55. This result indicates that both index samples in this study are suitable for factor analysis. Moreover, the result of Barlett's test is statistically significant. Finally, the results show that the selected indicators of the insurance inclusion index and political risk index are related. Accordingly, the principal component analysis results for the insurance inclusion index and political risk index are shown in Table 4 and Table 5.

Table 4: Insurance İnclusion Index Key Components Matrix Table

Indıcators	**Factor 1**	**Factor 2**	**Factor 3**
Life Insurance Volume/GDP (%)	0.14	-0.54	0.5
Non-life Insurance Volume/GDP (%)	0.24	0.59	-0.20
Insurance and financial services (percentage of commercial services exports)	-0.41	0.59	-0.20
Insurance and financial services (share of service imports in the Balance of Payments)	-0.38	0.34	0.52
Number of Insurance Companies Per 100 Thousand People	0.52	0.07	0.52
Financial Development Index	0.56	0.30	0.12

According to the results in Table 4, the main components of the indicators of insurance inclusion are the number of insurance companies per 100 thousand and the index of financial development. In addition, the values of the hands in Table 5 show that the indicators in the index complement each other. Therefore, the study uses these values to construct the insurance inclusion index. The factors affecting the insurance inclusion index were analyzed using principal component analysis in the next part of the study. Table 5 shows the matrix table of the components of political risk.

Table 5: Political Risk Components Matrix Table

Indicators	Factor 1	Factor 2	Factor 3
Democratic Accountability and Freedom of Expression	0,27	-0.69	0,32
Political stability and absence of violence	0,16	0.41	0.85
Government Activity	0,43	0.40	-0.38
Regulatory Quality	0,44	0,26	-0,04
Law and order	0,47	-0.33	-0.11
Control of Corruption	0,53	-0.03	0.02

On the other hand, according to the results in Table 5, the most important political risk components in the E-7 countries are political stability and absence of violence, government efficiency, democratic accountability, and freedom of expression. Therefore, these political risk components can be evaluated as the essential political risk in E-7 economies.

3.2. Model Results

In this part of the study, the analysis of the factors that influence insurance inclusion, made by estimating equation 6, and its results are included.

$$II_{it} = \alpha_i + \beta_1 GDP_{it} + \beta_2 Policy_{it} + \beta_3 WUI_{it} + \beta_4 SDI_{it} + \beta_5 Urban_{it} + \beta_6 Goverment_{it} + \varepsilon_{it} \quad (6)$$

The primary hypothesis of the model to be estimated using equation 6 can be expressed as follows:

H1: Selected socioeconomic indicators directly impact the insurance inclusion rate.

Since insurance inclusion means that households, especially low-income households, actually have access to insurance services, the economic indicators were influential in shaping this service for future use. Therefore, the socioeconomic indicators were expected to influence insurance inclusion. Consequently, it was possible to test the primary hypothesis H1 using the models established in the study. The descriptive test statistics for the variables used to test these hypotheses are shown in Table 6.

Table 6: Descriptive test statistics for variables

Variables	Mean	Standard Deviation	Minimum	Maximum	Normality Test (chi2)
II	-3.61e-10	1.005141	-1.821918	2.238334	4.91 (0.08)*
GDP	.0511063	.037608	-.0779999	.1423086	17.38(0.00)***
Policy	8.72e-10	1.005141	-2.023737	1.714267	7.92 (0.01)**
WUI	.2050727	.1479213	0	.7221146	17.73 (0.00)***
SDI	0.1037898	0.0475	0.0312	0.2123	11.45 (0.00)***
Urban	0.01987469	0.010064	-0.003413	0.0397	11.29 (0.00)***
Goverment	0.1390	0.0364	0.0810	0.2078	3.52 (0.17)

Note: Values in parentheses are probability values. In addition, * indicates significance levels of 0.10, **0.05, and *** 0.01.

To determine the factors affecting insurance inclusion in the E-7 countries, it was first necessary to determine whether there was a correlation between the units of the countries that make up the panel data, i.e., to examine cross-sectional dependence. In this context, the cross-sectional dependence test was first performed before starting the analysis. In other words, it was tested whether a shock that occurred in the series had the same magnitude of impact for all horizontal sections (Akçay and Erataş, 2012:12). In other words, it was performed to determine whether a shock that occurred in the series had the same magnitude of impact for all horizontal sections (Akçay and Erataş, 2012:12).). In this context, the cross-section dependency test developed by Pesaran (2004) was used. The test results are given in Table 7. According to the findings of the cross-sectional dependency test in Table 7, the null hypothesis of no cross-sectional dependency in E-7 economies was accepted. This finding indicates that a shock occurring in the series does not have the same effect in all horizontal sections.

Table 7: Test Results of Cross-Section Dependence

Test	**Statistics Value**
Pesaran test	-0.378
Pesaran Test P value	0.70

In the study, after cross-sectional dependence, the stationarity properties of the variables were examined. Since no cross-sectional dependence was found in the panel data used in the study, one of the first generation unit root tests, the test of Maddala and Wu (1999), was used for the stationarity of the variables, and the test results are presented in Table 8.

Table 8: Results of Maddala and Wu Unit Root Test

Variable Name	Maddala and Wu Test Statistics
II	30.337***
GDP	35.021***
Policy	30.707***
WUI	33.780***
SDI	63.614**
Urban	118.414***
Goverment	163.76***

Note: The deterministic specification of the tests includes constant and trend. In addition, * indicates significance levels of 0.10, **0.05, and *** 0.01.

The results of the unit root tests in Table 8 clearly show that the panel used in the study is stationary at the variable level. In other words, according to the test results, all the series in question contained no unit root in their original state, i.e., they were stationary at the I(0) level.

In the next phase of the study, autocorrelation and heteroskedasticity tests were performed in the second stage to determine the appropriate method for the analysis. In this direction, the Wooldridge autocorrelation test was used to test whether the model has an autocorrelation problem. In addition, the modified Wald test was used for the varying variance. The test findings obtained are given in Table 9.

Table 9: Heteroskedasticity and Autocorrelation Test Results

Test Name	Test Statistics
Modified Wald Test	25.59 (0.00)***
Wooldridge autocorrelation test	14.26(0.00)***

Note: () refers to the probability values of the variables. * indicates the significance levels of 0.10, **0.05, and *** 0.01.

The model established according to the test results in Table 4 has heteroskedasticity and autocorrelation problems. For this reason, it would be appropriate to choose the Park-Kmenta method, which gives practical and consistent estimation results, even if the technique used in the study has Heteroskedasticity and autocorrelation problems. Therefore, in the study, the model presented in Equation 9 was first estimated using the Parks-Kmenta estimator, and the results are shown in Table 10.

Table 10: Parks-Kmenta Model Estimation Results

Variables (II is the Dependent variable)		coefficients
GDP		0.0160 (0.02)**
Policy		-0.34 (0.00)***
WUI		-0.50 (0.003)***
SDI		0.059 (0.001)***
Urban		0.47 (0.00)***
Goverment		0.140 (0.00)***
C		-3.473 (0.00)***
Number of Observations:98	Wald Statistics: 146.83	Prob:0.00

Note: Values in parentheses are probability values. In addition, * indicates the significance levels of 0.10, **0.05, and *** 0.01.

According to the estimation results in Table 10, a statistically significant positive relationship exists between economic growth and insurance inclusion. This result indicates that the increase in income and the increase in income level have a positive effect on insurance inclusion. Therefore, a higher income level can promote access to insurance services at all income levels, especially for the low-income group. In addition, the above result shows that the inclusiveness of the financial market that has developed with economic growth has increased, and the insurance sector has been positively affected. The same conclusion was reached by Browne and Kim (1993), Beck and Webb (2003), Li et al. (2007), Elango and Jones (2011), Kjosevski (2012), Medeiros Garcia (2012), Liu and Zhang (2016), Cavalcante et al. (2018) and Canh et al. (2021).

It was found that the variables of global uncertainty and political risk, among the variables discussed in the study, are statistically significant and negatively affect insurance inclusion. In other words, the results prove that global uncertainty and political risk have a negative effect on the insurance sector.

Global uncertainty and national political risk lead to higher premiums insurance providers charge. As a result, Balcilar et al. (2020) state that insurance companies must charge their customers higher premiums to mitigate these risks in situations of high uncertainty and risk. This increases the cost of access to the insurance industry. Thus, it can be said that global uncertainty and political risks discourage individuals from using insurance services, i.e., they reduce insurance inclusion.

On the other hand, the empirical results showed that the sustainable development index and urbanization variables have a statistically significant and positive effect on insurance inclusion in the E-7 countries. The process of sustainable development in the E-7 countries leads to a gradual increase in urban population. As a result, the demand for insurance services increases as a growing urban population brings more assets, properties, and liabilities. This increases the diversity of insurance services and makes it easier for individuals to access them. Sustainable development and higher levels of urbanization, therefore, increase insurance inclusion. From this perspective, achieving Sustainable Development Goals and urbanization is one of the critical drivers of insurance inclusion.

Finally, the public expenditure variable was found to have a statistically significant and positive effect when examining the relationship between public expenditure and insurance inclusion. The result is that public spending by states, especially on social insurance benefits, creates a source of income, as Lewis (1989) puts

it. This facilitates access to insurance benefits, especially for low-income individuals who want it. Therefore, increasing public spending contributes to the spread of insurance benefits to low-income populations and ultimately positively affects inclusion in the insurance sector.

3.2.1 Robustness of the Model

In this part of the study, quantile regression analysis was performed to confirm the results of the Parks-Kmenta estimation used to test the H1 hypothesis. One of the main reasons for choosing quantile regression was its suitability for analysis when most variables in the data set are not normally distributed. Another reason why this method was preferred was that robust estimates could be obtained due to the robustness of the quantiles obtained in quantile regression. Since this is true for the variables in the study's data set (Table 6 and Table 9), it is clear that this method is suitable for obtaining consistent results. Here, the quantile values were taken as nine quantiles between 0.10-0.9 to represent the data set. For this reason, 0.10 for the low quantile, 0.50 for the middle quantile, and 0.90 for the high quantile were used for the analysis in this study. The results are shown in Table 11.

Table 11: Quantile Regression Results

Variables II DEPENDENT	0.1 quantile	0,2 quantile	0,3 quantile	0,4 quantile	0,5 quantile	0,6 quantile	0,7 quantile	0,8 quantile	0,9 quantile
GDP	0.23**	0.04*	0.03**	0.04**	0.03**	0.03**	0.03**	0.04**	0.04*
Policy	-0.51***	-0.44***	-0.5***	-0.49***	-0.46***	-0.48***	-0.47***	-0.44***	-0.56***
WUI	-1.19***	-1.01***	-1.02**	-0.97**	-1.17***	-1.03	-1.24***	-1.21***	-1.51***
SDI	0.09***	0.07***	0.08***	0.08***	0.07***	0.07***	0.09***	0.08***	0.09***
Urban	0.56***	0.61***	0.61***	0.55***	0.51***	0.57	0.51***	0.48***	0.36***
Goverment	0.23***	0.23***	0.21***	0.17***	0.16***	0.15	0.13***	0.12***	0.10***
C	-5.96***	-5.62***	-5.29***	-4.48***	-4.05	-3.96	-3.55	-3.25	-2.52***
Sparsity	1.83	1.44	1.26	1.11	1.04	1.01	1.06	1.25	1.78
Quasi-LR statistic	111.63	120.82	117.61	134.41	156.32	180.3	194.47	205.33	173.09
Prob(Quasi-LR stat)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
Pseudo R2	0.57	0.55	0.52	0.53	0.56	0.59	0.62	0.67	0.69

Note: * indicates the significance levels of 0.10, **0.05, and *** 0.01.

According to the estimation results in Table 11, the relationship between economic growth, sustainable development, urbanization, public spending, and insurance inclusion is statistically significant for all quantiles and has a positive effect. On the other hand, the political risk and uncertainty variables are statistically significant for all quantiles and negatively affect insurance inclusion. Examination of the results showed that the slope parameters of economic growth, sustainable development, urbanization, and public expenditure are consistently positive for the E-7 countries, regardless of which of the nine quantiles between 0.10-0.9 was included in the study. Similarly, it can be seen that the slope parameters for the political risk variable and the uncertainty variable are consistently negative. This finding indicated that regardless of which region of the conditional distribution of the insurance inclusion variable one focuses on, similar effects are obtained with the Parks-Kmenta estimation results. Thus, it means that the direction of the influence of the relationship between the variables follows a stable course. From here, the H1 hypothesis states that macroeconomic indicators directly affect insurance inclusion can be evaluated and confirmed by the Parks-Kmenta estimator results and the quantile regression results.

CONCLUSION

In recent years, parallel to the development of financial markets in the world, the increasing importance of the insurance sector has been observed. This increase is due to the sector's key role in stabilizing economies. As Canh (2021) states, the main reason for the increasing importance of insurance companies in financial markets is, on the one hand, the promotion of long-term investments and, on the other hand, the provision of insurance services to individuals and the ability to protect their investments and assets. On the contrary, the

extent to which insurance services are accessible is one of the most critical factors determining the insurance industry's effectiveness. At this point, the period to which individuals have access to the insurance services they need comes to the fore. More broadly, whether insurance customers have access to insurance services, in other words, the degree of inclusion in the insurance industry, is an essential factor in determining the insurance industry's effectiveness.

Based on the importance of inclusion in the insurance sector, this study aims to examine the macroeconomic factors that affect insurance inclusion in the E-7 countries whose financial markets are overgrowing and have significant value in terms of economic size (Hawksworth and Cookson 2006; Tekin, 2020). This was analyzed using a panel data set from 2004-2017, the principal component analysis (PCA) method, the Parks-Kmenta estimator, and the panel quantile regression method. The empirical results showed that involvement in the insurance sector is positively influenced by macroeconomic factors such as economic growth, sustainable development, urbanization, and public expenditure variables. This finding is similar to Kugler and Ofoghi (2005), Vadlamannati (2008), Ege and Saraç (2011), Zyka and Myftaraj (2014), Sener and Behdioğlu (2014), Demirci and Zeren (2017), Pradhan et al. (2017), Yenisu (2019), and Muhtar and Agboola (2021). In contrast, it is negatively affected by risk components such as global uncertainty and political risks. This finding is similar to Lim and Haberman (2003), Lee et al. (2013), Akpinar and Yizdiz (2018), Gupta et al. (2019) and Balcilar et al. (2020). Thus, the results suggest that macroeconomic factors significantly influence inclusion in the insurance sector.

From this point of view, the following assessments can be made about the results obtained. First, with the improvement of sustainable and economic development, the lack of income, considered the most critical obstacle to inclusion in the insurance sector, becomes an essential driver for inclusion in the insurance sector. It can be said that the increase in the income level of individuals with simultaneous progress in sustainable development, especially in the E-7 countries, plays a vital role in this positive effect. However, it is known that progress in sustainable development will promote the human development of nations. The human development of countries will help overcome the problem of low insurance literacy, which is a significant barrier to more efficient access to insurance services. Second, in the E-7 countries, public expenditures such as social insurance benefits positively impact insurance inclusion through the additional income effect they generate. Therefore, the increase in social security benefits will also positively impact insurance inclusion, especially for low- and middle-income groups. Third, with the urbanization observed in the E-7 countries, the problems that have arisen and the tendency of people to self-insure have increased the need for insurance. Since this improves access to insurance services, it positively impacts insurance inclusion. Finally, low- and middle-income groups, which currently use only a small portion of insurance services, cannot afford the rising costs of insurance products and services due to global uncertainties and national political risks, reducing the effectiveness of access to insurance services. Therefore, factors such as global uncertainty and political risks are among the macroeconomic factors that worsen the inclusion of the insurance sector.

The findings of the study are thus an essential guide to what can be done to increase insurance inclusion. As the results show, insurance inclusion is significantly influenced by macroeconomic factors such as economic growth, sustainable development, urbanization, public spending, global uncertainty, and political risks. Therefore, it is crucial to develop remedies for these macroeconomic factors. The study is expected to provide helpful information for developing strategies in this direction. In addition, thanks to financial inclusion, the revitalization of the E-7 countries will be ensured, and the growth of their economies will be accelerated. Therefore, in economies with high growth potential, such as these countries, reforms should be implemented to promote the living standards and welfare of lower-income groups. At the same time, practices should be developed to increase the efficiency of the financial system and enable insurance inclusion. To this end, the E-7 countries should advertise and create incentives that lead individuals to insurance by offering insurance benefits and stimulating their interest in insurance.

The limitation of this study is that the data included in the analysis are available through 2017. Future studies could examine other dimensions of insurance using different methods. In addition, future studies could create a diverse panel by adding other variables in place of those with missing data, and additional studies could be conducted.

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