EXPLORING LIFE INSURANCE AS A DRIVER OF SOCIO-ECONOMIC DEVELOPMENT: AN EUROPEAN UNION ECONOMETRIC PERSPECTIVE

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Abstract

The heterogeneous nature of the European Union countries provides an analytical framework to assess the development degree of life insurance about economic and social development, which is the main objective of this study. Using Structural Equation Modelling (SEM) as a methodological approach, with latent variables for life insurance dimensions, this article investigates the relationships between key life insurance and socio-economic indicators, over the period 2013-2023. The results of the econometric analysis reveal statistically significant associations between life insurance dimensions, on the one hand, and human development, poverty reduction and employment, on the other hand, which show that insurance markets contribute to socio-economic development through channels beyond direct economic growth. The results contribute to the existing literature, providing aspects of the role of the life insurance sector in promoting economic and social resilience and improving quality of life in the context of the diversified European Union Member States, contributing to the future objectives of sustainable economic development.

Keywords

life insurance, European Union, economic development, poverty, Structural Equation Modelling

JEL Classification

C30, F63, G22

Introduction

The European Union (EU), characterized by distinct economies of each country, provides an exceptional analytical framework for identifying the interconnections between social welfare factors. According to Della Posta (2023), the EU has undergone a significant transformation since the global financial crisis, with the insurance sector playing an increasingly vital role in economic stabilisation and social protection mechanisms.

The complex relationship between the development of the insurance sector and socioeconomic factors has emerged as a crucial analysis both in current and previous economic research (Cummins et al., 2016; Eling, 2024). The EU presents a particular case study,

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and the insurance sector, in particular life insurance, is a fundamental component of prosperity and social protection (Arena, 2008; Haiss and Sümegi, 2008).

This study aims to investigate the complex interconnections between life insurance dimensions and socio-economic development in the EU Member States, in the period 2013-2023. The methodological framework employs an advanced econometric model, namely, Structural Equation Modelling (SEM), which allows for a comprehensive examination of the effects of complex interactions, using a latent variable for the life insurance construct.

This research contributes to the existing literature in several ways. First, it provides a rigorous empirical analysis of the link between life insurance and socio-economic development in the specific context of EU Member States. Second, it uses an advanced econometric technique to address methodological challenges identified in previous studies. Finally, it provides relevant information on the dual link between the life insurance sector and economic and social welfare.

The article is precisely structured, preliminary with the introduction of the analysed aspects, followed by a literature review section, in which, a comprehensive identification of existing empirical studies is presented. Moreover, the applied methodology and the data used are addressed. The empirical results obtained are presented further, followed by recommendations for future research directions. For a clear understanding, additional information obtained from econometric analyses is inserted at the end of the paper as an annexe.

1. Review of the scientific literature

Previous research has focused on the complex links between the life insurance sector, poverty reduction mechanisms and economic development trajectories within the complex institutional framework of the EU Member States (Haiss and Sümegi, 2008; Kjosevski, 2012; Ouedraogo et al., 2016; Burić et al., 2017; Borda et al., 2020; Cristea et al., 2021; Cheng and Hou, 2022).

Lee et al. (2013) used an econometric test, covering three levels of income countries, revealing bidirectional causality in the developed economies, which suggests that, in emerging economies, the development of the insurance sector may precede broader economic progress.

Chiang et al. (2022) identified specific links, highlighting the role of a regulatory body in supporting the development of the life insurance sector, emphasizing the importance of regulatory quality. The main findings support the hypothesis that the insurance sector significantly influences economic development in various ways in the EU Member States with better regulatory quality.

Likewise, the relationship between the life insurance and economic growth has received distinctive attention, several studies addressing the interconnections between them (Curak et al., 2009; Hou et al., 2012; Segodi and Sibindi, 2022; Singhal et al., 2022; Srinivasan and Mitra, 2024). Curak et al. (2009) used a dynamic methodology by which they examined transition economies in the period 1992-2007, finding that insurance premiums positively affected economic growth. Hou et al. (2012) carried out a comprehensive analysis of the efficiency of the insurance sector in terms of economic growth in the Euro Area, highlighting significant disparities in the established relationship. The analysis

showed that the life insurance sector in Euro Area countries does not have a large impact on economic development, indicating a potential multicollinearity between the variables used. In the same manner, Singhal et al. (2022) proved the connection between insurance and economic growth for Asian countries, but acted different among them.

On the other hand, Dawd and Benlagha (2023) analysed sixteen OECD countries and found non-linear effects depending on insurance market maturity. Western European countries have demonstrated stronger growth effects of life insurance development than Eastern European countries. Nevertheless, high inflation represents an unfavourable factor for life insurance, alongside with" income, unemployment, interest rates" (Segodi and Sibindi, 2022, p. 1).

Households with low income often face barriers to accessing the life insurance, including affordability (financial resources) (Kominski et al., 2017), lack of financial literacy (Goyal and Kumar, 2021; Siminică et al., 2025), and distrust of institutions (Cohen et al., 2003). As regards the causality between the life insurance and poverty, insurance gaps are largest among low-income households and rural communities, which perpetuates and deepens these disparities (Kainat et al., 2024).

Therefore, the complex relationship between the life insurance and economic and social development presents multifaceted challenges, with mixed implications observed. However, the direction of causality between the life insurance development and economic and social development remains a broad topic in the literature.

2. Research methodology

The data comprises variables grouped into two categories, namely, the life insurance dimension and economic and social indicators (table no. 1), extracted for the period 2013-2023, for all 27 EU Member States. Variables for the life insurance group include most used indicators for assessing insurance dimension in the recent studies and international statistics, namely, the contribution of insurance to Gross Domestic Product (GDP) creation – insurance penetration degree, and the amount paid by an inhabitant for insurance consumption - insurance density (Cristea et al., 2021; Din et al., 2017; Pradhan et al., 2023). As regards economic and social factors, we considered indicators that measure economic development (GDP growth), quality of life (Human Development Index – HDI, and poverty rate), labor market performance (employment rate) and inflation.

No.	Explanation of variables	Group of variables	Unit of Measure (UM)	Acronym	Source
1.	Life insurance penetration	Life	% of GDP	lg_p	Swiss Re Institute (2023)
2.	Life insurance density	insurance dimension	United States Dollars (USD)/inhabitants	lg_d	Swiss Re Institute (2023)
3.	GDP growth		annual %	lg_g	European Commission (2023)

Table no. 1. Database of the variables during 2013-2023, across the EU

4.	HDI	Economic and social indicators	Scor (0 to 1)	lg_hd	United Nations Development Programme (2023)
5.	At-risk-of- poverty rate		% of total population	lg_r	European Commission (2023)
6.	Employment rate, 20-64 years		% of total population	lg_m	European Commission (2023)
7.	Harmonized Index of Consumer Prices (HICP)		% annual rate of change	lg_hc	European Commission (2023)

Source: Authors' contribution

The data used in the econometric analysis are presented in table no. 2. The data shows that (table no. 2), at the level of the EU for the period 2013-2023, the life insurance dimensions are represented by an average of 2.95% of life insurance contribution to GDP, with a medium amount paid by an inhabitant of 1354.66 USD/person. Economic growth revealed a mean of 3.53% of annual GDP, while quality of life, measured by HDI - based on health (life expectancy), education, income, and poverty, registered an average of 0.89, respectively, for 22.46% of the population. The medium rate of employment over the entire period 2013-2023 was 72.62% of the population, and the inflation, of 2.56%. To avoid non-linearity and to ensure the accuracy of the results, the variables were transformed, and the logarithmic values of the data were used in the econometric analyses.

Variables	Observations	Mean	Standard deviation	Minimum	Maximum					
Actual (crude) values										
Life insurance penetration	256	2.954922	2.394253	0.2	9.68					
Life insurance density	255	1354.66	1423.292	21	5803					
GDP growth	297	3.532492	9.303219	-11.3	97.53					
HDI	270	0.8915185	0. 0386807	0.8	0.96					
Poverty rate	295	22.4461	6.359275	10.8	41.9					
Employment rate	297	72.61616	6.142399	52.9	83.5					
НІСР	297	2.557239	3.604158	-1.6	19.4					
N total	297									

Table no. 2. Descriptive statistics of data, 2013-2023

Logarithmic (lg) values								
lg_p	256	0.7064329	0.9427815	-1.609438	2.270062			
lg_d	255	6.439775	1.456533	3.044523	8.66613			
lg_g	232	1.090892	1.096663	-2.65926	4.58016			
lg_hd	270	0.1264749	0.0467674	0.2613648	0.040822			
lg_r	295	3.073467	0.2723282	2.379546	3.735286			
lg_m	297	4.283144	0.0878612	3.968403	4.424847			
lg_hc	253	0.5126127	1.186302	-2.302585	2.965273			
N total	297							

Source: Authors' contribution in Stata 16

The research methodology consists in applying *Structural Equation Modelling (SEM)* to identify overall connections (Escobar, 2016), between selected indicators at the EU level. SEM is approached to observe how life insurance dimensions (introduced as a latent variable) influence the socio-economic credentials of the EU region, based on previous literature underpinnings, as Chetioui et al. (2024) assessed at the level of Islamic countries.

Therefore, to ensure a comprehensive analysis and accuracy of the results, we introduced a *latent construct* (*Lfl*), to measure" the variance and covariance of the indicators" (Kang, and Ahn, 2021, p. 158), that includes both life insurance penetration degree (lg_p ,) and life insurance density (lg_d). The life insurance construct (*Lfl*) was used to assess the implications of each life insurance dimension - penetration in GDP and life insurance density, on the one hand, and overall implications of the life insurance sector, on the other hand, on the representative socio-economic factors.

The hypothesis of our research is:

- *H1. The contribution of life insurance sector to GDP (life insurance penetration) favourably influenced socio-economic credentials of the EU region;*
- H2. The amount paid by an inhabitant for buying life insurance (life insurance density) favourably influenced socio-economic credentials of the EU region;
- H3. Overall, the life insurance sector favourably influenced socio-economic credentials of the EU region.

3. Results and discussions

To observe the links between the life insurance and socio-economic development at the level of the EU Member States, Structural Equation Modelling (SEM) was approached, by applying maximum likelihood (ML) method, with the latent construct for life insurance indicators (*Lfl*), namely life insurance penetration degree (lg_p) and life insurance density (lg_d).

Further, to determine the accuracy and suitability of the model for data analysis, several tests of statistical significance were applied (table no. A1 and table no. A2 from

Appendix). From table no. A1, we can see that, while the Comparative Fit Index (0.972) and Normed Fit Index (0.969) suggest satisfactory fit because they exceed the conventional threshold (>0.95), the Tucker-Lewis Index (0.852) drops a little below the limit (>0.90). These statistical significances, together with descriptive statistics presented in table no. A2 from Appendix captures substantial relationships by applying SEM analysis.



Figure no. 1: Path diagram of SEM results by applying the ML, life insurance, 2013-2023

Source: Author's research contribution in JASP 19

Figure no. 1 reveals strong relationships for both indicators of latent construction (*Lfl*), with insurance density showing a slightly higher relationship (1.13) than insurance penetration (fixed at 1.00). The explanation is that a high density of the life insurance positively impacts economic development and quality of life by mobilising individual savings and directing them toward long-term investments. Moreover, as regards poverty's implications, according to Churchill (2006), life insurance plays a key role in poverty reduction strategies, as it helps vulnerable households maintain financial stability and avoid falling into poverty after major shocks. Furthermore, when more individuals invest in life insurance, a larger pool of funds is accumulated and reinvested into the economy, often through stable, long-term financial instruments. This helps reduce excessive consumption and supports productive investments, which can ease inflationary pressures.

Moreover, by encouraging disciplined financial behaviour and reducing uncertainty, life insurance contributes to a more stable macroeconomic environment. Therefore, each of the life insurance indicator presented a positive implication on social and economic factors and the hypothesis H1. The contribution of life insurance sector to GDP (life insurance penetration) favourably influenced socio-economic credentials of the EU region and H2. The amount paid by an inhabitant for buying life insurance (life insurance density favourably influenced socio-economic credentials of the EU region, are fulfilled. The links between the indicators observed in figure no. 1 and statistical significance presented in table no. A2 from Appendix provide important evidence on the impact of the life insurance sector on socio-economic indicators. The latent variable (LfI) shows a strong positive relationship (0.89, statistically significant, p<0.001) with the quality of life, measured by HDI (lg hd). The results obtained are in line with the study of Muresan and Armean (2017) and Cristea et al. (2021), which showed similar effects of the life insurance on economic indicators, namely, human development degree. Similarly, Alhassan and Biekpe (2016) identified positive associations in their analysis, suggesting key contributions to the impact of insurance on economic development by improving financial intermediation and resource allocation efficiency.

The significant favourable association (-0.42, statistically significant, p<0.001) between the latent variable (*LfI*) and poverty (lg_r) complements the findings of Sawadogo et al. (2018), who identified different linkage specifications. This favourable relationship indicates that a more developed insurance sector contributes to poverty reduction.

As regards the labour market, the model indicates a modest but statistically significant positive relationship (0.13, statistically significant, p=0.002) between the latent variable (*LfI*) and employment rate (*lg_m*). This relationship suggests significant benefits in the labour market through the development of the life insurance sector. This finding is in line with Firtescu (2014) study, which identified positive effects on employment in the life insurance sector in Romania and Europe.

The relationship between the latent variable (*LfI*) and economic growth (lg_g) is negative, but not statistically significant (-0.088, p=0.202). The results, even if insignificant, align with the study by Cheng and Hou (2022), who found insignificant relationships between life insurance and economic growth, in a study based on data from the Eurozone. As regards implications of the life insurance construct (*LfI*) on inflation, the causality is not statistically significant (p=0.209), but is, overall, a favourable one (-0.15).

Structural equation modelling (SEM), by the path diagram shown in figure no. 1 and through the additional analyses in the Appendix (table no. A1 and table no. A2), provides substantial evidence for assessing the *H3*. Overall, the life insurance sector favorably influenced the socio-economic credentials of the EU region, which is fulfilled for all indicators, except for economic growth. The strong relationships with the HDI (lg_hd) , poverty reduction (lg_r) and employment (lg_m) suggest that insurance markets contribute to socio-economic development through channels beyond direct economic growth.

The results of this econometric analysis suggest that the life insurance sector influences social and economic development through channels that are not directly captured in conventional growth indicators, being in line with Chang et al. (2014), who identified the complexity of the relationship in their analysis of life insurance dynamics.

Conclusions

This article highlights the multidimensional role of the life insurance sector in socioeconomic development in EU Member States. The statistically significant links identified between life insurance penetration and keystone socio-economic indicators underline that the life insurance sector's contributions extend beyond traditional economic growth paradigms and require diverse socio-economic indicator approaches. These results suggest life insurance functions as a stabilisation mechanism in the broader socioeconomic framework, facilitating resilience and risk mitigation.

In addition, the complex interaction of determining factors influencing sustainable economic development was observed. The positive impact of life insurance on human development reaffirms alignment with previous research (Alhassan and Biekpe, 2016; Cristea et al., 2021; Mureşan and Armean, 2017). In contrast, negative associations with economic growth reinforce the idea that economic development and prosperity are not just a function of economic performance but are embedded in a broader institutional and socio-economic context.

Given these perspectives, it is essential to approach economic development as an overview of human development, financial inclusion and socio-economic stability (Ionescu et al., 2020). Strengthening and supporting the life insurance sector and with strategies to mitigate inflationary pressures, could enhance the ability of life insurance to contribute to long-term economic well-being. As policies recommendation for the EU life insurance market, we propose the following: introduction and support microinsurance products/markets offering simplified products, low premiums, dedicated to vulnerable persons (low income, rural and minority communities); financial education initiatives – as Siminică et al. (2025) highlighted; helping families to maintain income, access to healthcare, and invest in education during and after life events; using technology, like digital systems, to reach underserved communities.

Main limitations of this research are the lack of data for some countries and periods, but also the analysis for all EU countries panel dataset, given the heterogeneity of them. Future research directions are focused on analysis of each EU country or groups of similar Member States according to their performance on insurance market and level of development, or by including more factors, such as digital technologies.

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APPENDIX

Table no A1. Fit indices for SEM, life insurance i	narket
Index	Value
Comparative Fit Index (CFI)	0.972
T-size CFI	0.942
Tucker-Lewis Index (TLI)	0.852
Bentler-Bonett Non-normed Fit Index (NNFI)	0.852
Bentler-Bonett Normed Fit Index (NFI)	0.969
Bollen's Relative Fit Index (RFI)	0.838
Bollen's Incremental Fit Index (IFI)	0.972
Relative Noncentrality Index (RNI)	0.972

----OTAL PR. • .

Note: T-size CFI is computed for $\alpha = 0.05$. The T-size equivalents of the conventional CFI cut-off values (poor < 0.90 < fair < 0.95 < close) are poor < 0.813 < fair < 0.888 < closefor model: Model 1.

Source: Authors own research contribution in JASP 19

Outcome	Predictor	Esti	Sta nda rd	z-value	р	95% Confidence Interval	
		mate erro r				Low er	Upp er
lg_g	Life Insurance	-0.088	0.069	-1.275	0.202	-0.224	0.047
lg_hd	Life Insurance	0.893	0.047	18.945	< 0.001	0.801	0.986
lg_r	Life Insurance	-0.496	0.057	-8.677	< 0.001	-0.609	-0.384
lg_m	Life Insurance	0.189	0.061	3.115	0.002	0.070	0.309
lg_hc	Life Insurance	-0.082	0.065	-1.256	0.209	-0.210	0.046

	Table no A2.	Summary	statistics	for	SEM,	life	insurance	market
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Source: Authors own research contribution in JASP 19