

Distribution Channel Models in Life Insurance: Identifying Key Influencing Factors

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Abstract: The life insurance industry is undergoing significant transformation driven by evolving consumer preferences, technological advancements and changing market dynamics. As insurers adapt to a changing landscape, distribution channel models are becoming a critically important factor in determining success and profitability in the market. The aim of this article is to develop a scientific and methodological basis for substantiating distribution models for life insurance products, which involves defining homogeneous groups of countries and identifying key factors that influence sales models. The methodological tools used in this study were Gaussian mixture models to determine the distribution models of life insurance products and the common factor rotation method (Varimax) to calculate the degree of influence of relevant indicators on the distribution models. The research period is 2008--2019, and the objects of the study are 13 countries in the European Union. Calculations are performed via the Python programming language. This article presents the results of a cluster analysis of countries, which allowed us to identify three key models in the sale of life insurance products: the bancassurance model (Spain, France, Italy, Malta, Portugal), the intermediary model (Bulgaria, Germany, Hungary) and the hybrid model (Sweden and the United Kingdom). Analysis of changes in cluster distribution indicates stability in the grouping of most countries, although in some cases, there is a transition between clusters. By identifying similarities and differences between countries and analysing the impact of socioeconomic and technological factors, this study contributes to the development of effective distribution strategies in the dynamic insurance market. The results of factor analysis revealed that the most significant differences between clusters were observed in indicators of internet access, level of education and index of hours worked. The greatest impact on the bancassurance product distribution model is exerted by digital development indicators (frequency of internet use, level of internet access), the intermediary model, the level of citizens' access to the internet and the level of citizens' education, and the hybrid model, the frequency of internet use and the level of urbanization in the country. The results of this study have practical importance for insurance companies and financial institutions seeking to optimize their distribution channels and adapt to modern market requirements.

Keywords: bancassurance; distribution channels; insurance brokers; insurance agents; insurance premiums; life insurance.

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1. Introduction. The distribution of insurance services is a fundamental function within the insurance industry, encompassing all activities required to present products to the market, successfully conclude insurance contracts, and maintain communication with policyholders in the event of a claim. A strategically designed distribution policy not only enables insurance providers to attract new customers and retain existing ones but also helps reduce operational costs and improve overall efficiency. Access to a broad range of distribution channels enhances the availability of insurance services, making them more accessible to diverse consumer groups.

In recent years, the life insurance distribution landscape has experienced profound changes driven by legislative reforms, the development of digital technologies, and the evolving expectations of consumers. The rapid emergence of insurance companies and digital tools has enabled insurers to expand their direct sales through online platforms, mobile applications, and other web-based services. As a result, consumers increasingly purchase insurance directly from providers, reducing their reliance on traditional intermediaries such as agents and brokers. This transformation marks a shift from single-channel to multichannel distribution models, in which insurers combine traditional and digital strategies to enhance outreach and customer engagement.

Assessing the influence of socioeconomic and technological factors on the distribution of life insurance products is especially relevant in today's dynamic and competitive market. Indicators such as internet access, the frequency of internet use, educational attainment, urbanization, and labour patterns significantly influence how consumers interact with insurance services. Understanding these variables enables insurers to adapt their distribution strategies to better align with changing market conditions, reduce inefficiencies, and enhance the customer experience.

This study contributes to the literature by addressing a significant gap in the cross-national analysis of life insurance distribution models. Although prior research has explored the characteristics and evolution of individual distribution channels, empirical studies that cluster countries on the basis of distribution model similarities while identifying the key socioeconomic indicators that influence these models are lacking. By employing a combination of Gaussian mixture models (GMMs) for cluster analysis and the varimax rotation method for factor analysis, this paper offers a novel methodological approach for classifying life insurance distribution models and identifying their driving factors.

The central aim of this research is to develop a scientific and methodological basis for substantiating distribution models of life insurance products across European Union countries. Three research questions guide this study: What are the dominant models of life insurance distribution across EU countries? Which socioeconomic and technological indicators most significantly influence the choice of these models? How have the distribution models evolved between 2008 and 2019, and to what extent have countries transitioned between clusters over time? The objectives of the study are to classify EU countries into homogeneous groups according to their life insurance distribution patterns, determine the impact of key indicators on these models, and trace structural changes over time. These objectives support the development of informed and adaptable distribution strategies within the insurance sector.

The structure of the paper is as follows. The literature review synthesizes previous research on life insurance distribution, emphasizing the evolution of various models and identifying key gaps that this study seeks to address. The methodology section outlines the data sources, the rationale for selecting specific variables, the quantitative methods employed, the Gaussian mixture model (GMM) for clustering countries and the varimax rotation method for analysing the influence of socioeconomic and technological factors. The results section presents the findings of the cluster analysis, identifying three primary distribution models and tracking changes in cluster composition across three periods: 2008--2011, 2012--2015, and 2016--2019. It also examines the varying degrees of influence exerted by selected indicators on each model. The discussion interprets these results in the context of the literature, providing explanations for why certain countries align with particular distribution approaches. Finally, the conclusion summarizes the main findings, underscores their practical implications for insurers and policymakers, and offers recommendations for future research aimed at adapting insurance distribution to ongoing technological and regulatory transformations.

2. Literature Review. The development of life insurance plays a crucial role in economic stability, social security, and individual financial planning. Life insurance contributes significantly to economic stability by mobilizing savings and providing financial security (Feyen et al., 2013; Sawadogo et al., 2018; Šindelář & Erben, 2021). Several studies highlight the macroeconomic factors influencing life insurance demand. Beck and Webb (2003) demonstrated that income per capita, inflation, and the development of the banking sector are critical determinants of life insurance consumption across countries. Similarly, economic

growth and government policies promoting investment diversification have created opportunities for the life insurance sector (Wu & Wang, 2018).

Cultural and demographic variables also surface as influential factors. Park and Lemaire (2012) explored how cultural dimensions, such as uncertainty avoidance and individualism, impact life insurance purchases and noted that societies with greater uncertainty avoidance tend to exhibit greater demand for life insurance products. Consistent with this, Li et al. (2007) reported that demographic trends, particularly aging populations, correlate positively with life insurance growth due to increased risk aversion and estate planning needs. Research by Buric et al. (2017) highlights that younger people and higher levels of education positively influence life insurance adoption. Cultural factors also shape market dynamics. For example, Islamic life insurance in Indonesia is influenced by operational costs, company size, and compliance with Sharia law. These findings highlight the need for culturally tailored products to meet diverse consumer needs.

Financial literacy is pivotal in shaping consumer attitudes toward life insurance. Lin, Grace, and Rebello (2012) emphasized that higher levels of financial literacy increase life insurance ownership, particularly in emerging economies where consumer awareness is traditionally lower. This is echoed in the findings of Klapper, Lusardi, and Panos (2012), who demonstrated that targeted financial education campaigns could significantly increase insurance penetration.

The distribution of life insurance products is a critically important factor in the development of insurance companies, as the availability of insurance services for customers and the financial stability of insurers depend on the efficiency of sales channels (Singh et al., 2020). Chen (2021) suggested that the distribution channel is a systemically important factor in driving demand for insurance products. In recent years, distribution channels for life insurance products have evolved, moving from traditional face-to-face sales models to digital and hybrid approaches.

Direct channels involve insurers selling policies directly to customers without intermediaries. Studies indicate that these channels enhance control over customer relationships and reduce the costs associated with intermediaries (Magati, 2021). Outreville (1996) highlights that direct distribution is increasingly favoured owing to its simplicity and efficiency.

For a long time, the traditional agency model has been the basis for the distribution of life insurance products. Agents act as intermediaries who provide personalized advice and build trust with customers (Cummins & Doherty, 2006). Selling insurance products through an agent network is based on establishing interpersonal communications but is more capital intensive and often limited in geographical reach (Brockett et al., 2005). According to the results of a survey of executives of large life insurance companies from Western Europe, agents are the best distribution channel in this region. Furthermore, providing personalized insurance products has been shown to significantly impact achieving greater market penetration and customer reach (Owusu, 2023).

The brokerage model continues to play a significant role, especially in competitive markets with a variety of insurance providers. Trigo-Gamarra (2008) suggested that brokers provide customers with more options and professional advice, which leads to increased policyholder satisfaction. Recent studies also highlight how technological integration into brokerage services enhances efficiency and broadens market access (Eckert et al., 2021).

The bancassurance model has gained prominence because of its ability to capitalize on established customer relationships within the banking sector. It allows insurers to access wide client bases and leverage the trust already placed in banking institutions (Hong & Lee, 2014; Relan, 2020; Constantinescu, 2022). Thu Thuy et al. (2023) and Iqbal (2023) argue that a significant factor in making a decision to purchase an insurance product through a banking channel is a high level of trust in bank employees. Rubio-Misas (2022) empirically proved that the greater the proportion of life insurance premiums sold through the banking channel is, the greater the cost efficiency. Studies highlight its role in enhancing market penetration in emerging economies, where it addresses low financial literacy and income constraints by providing accessible, trusted platforms (Sabri et al., 2021; Naserian & Justus, 2019). In EU countries, bancassurance negatively correlates with nonlife insurers' profitability due to high intermediation costs, but its impact on life insurance remains understudied (Pavic Kramaric et al., 2021).

The development of digital technologies has transformed approaches to selling insurance products, with insurers now using online platforms, mobile applications, and chatbots to directly sell policies (Eling & Lehmann, 2018). Digital channels reduce costs and increase accessibility, but retaining customers and forming long-term, trusting relationships with them are challenging (Schmidt et al., 2019; Kajwang, 2022). Emerging technologies such as robo-advisors and blockchain-enabled smart contracts are also reshaping consumer trust

in digital insurance solutions (Gatteschi et al., 2018). Poland's voluntary insurance market stresses the role of mobile apps and automated underwriting in enhancing service quality (Przybytniowski, 2024). Insurance companies should tailor their communication and distribution strategies to multichannel segmentation, with an emphasis on digital touchpoints with customers (Alt et al., 2020).

The transformation of consumer behaviour is also driven by generational shifts. In particular, millennials and postmillennials prefer digital platforms, whereas older demographics still prefer human interaction (Ganapathy, 2023). Trust, convenience, and ease of access are key determining factors when a distribution channel is chosen (Eling & Kraft, 2020; Swee et al., 2021).

The paper identifies two models of state regulation of the insurance market—"Alpine" and "Atlantic" (Klumpes & Schuermann, 2011). The Atlantic model of state regulation (Great Britain, Ireland, Belgium, the Netherlands, Luxembourg) is based on obtaining a licence to carry out professional financial activities in compliance with certain financial requirements (solvency and liquidity margins, sufficient levels of insurance reserves, and regulated areas of investment in insurance reserves). According to the "alpine model" (Austria, Denmark, Finland, Germany and Switzerland), the insurance market is strictly regulated and includes not only all the abovementioned rules but also, above all, a preapproval system in which each tariff and each product must be approved before any activity can begin.

EU panel analyses reveal that market share and insurance density (premiums per capita) are key determinants of technical profitability, advocating for granular performance tracking in life insurance (Drakulevski & Kaftandzieva, 2021).

Despite a significant number of scientific publications on this issue, the issue of substantiating the main models of distribution of life insurance products, as well as identifying key factors that influence the effectiveness of these models, remains unaddressed.

3. Methodology. As part of the study, a scientific and methodological basis was developed to substantiate the distribution models of life insurance products, which involves determining homogeneous groups of countries and identifying key factors that influence the distribution model of insurance products.

To determine the distribution models of life insurance products, a cluster analysis was conducted via a machine learning method, namely, the Gaussian mixture model (GMM). This clustering method is based on the assumption that the data can be modelled as a set of Gaussian (normal) distributions with uncertain variables, i.e., each cluster is represented by a separate Gaussian distribution, and each data point has a probability of belonging to each of these clusters (Huang et al., 2017; Androniceanu et al., 2020; Hamdi et al., 2023).

Clustering countries by the level of similarity of distribution channels for life insurance products on the basis of the GMM involves the following steps:

- determination of the initial parameters of clusters, namely, the number and quantitative characteristics (average value, covariance matrix, weight coefficients for each cluster) (initiation phase).
- calculation of probable estimates of the parameters of the Gaussian mixture distribution. For each point, the probability of belonging to each cluster is calculated via the Bayesian probability formula (expectation phase).
- recalculation of the quantitative parameters of the clusters to maximize the likelihood of observations (maximization phase).
- checking the stopping of the algorithm. If the parameters stop changing or the likelihood of the data changing insignificantly, the algorithm terminates (final phase).

The GMM model equation determines the probability that a data point x is generated as a mixture of several Gaussian (normal) distributions. The formal form of the GMM model is described by equation (1) (Goldberg, 2009; Maugis et al., 2009; Jiao et al., 2022):

$$p(x) = \sum_{k=1}^K \pi_k \cdot N(x | \mu_k, \Sigma_k) \quad (1)$$

where K is the number of groups (clusters); π_k is the probability that a given object belongs to cluster k ; and $N(x | \mu_k, \Sigma_k)$ is the normal distribution with mean μ_k and covariance matrix Σ_k .

GMM training is performed via the expectation-maximization (EM) algorithm, which iteratively finds the parameters π_k , μ_k , and Σ_k , that best fit the data.

The object of the study was 13 EU countries for which data on the structure of distribution channels for life insurance products are publicly available. Clustering will be carried out in three periods (2008--2011; 2012--2015; 2016--2019), which will allow testing of the hypothesis of the presence or absence of structural shifts in the formation of distribution models for life insurance products. The input information is presented in the appendix.

To determine the degree of influence of relevant indicators on the distribution models of insurance products in the context of the formed clusters of countries, the factor analysis method was used, namely, the method of rotation of common factors (orthogonal transformation) – varimax. The varimax method involves phased implementation of the following steps:

1. Selection and justification of indicators that directly or indirectly influence the choice of distribution channel for life insurance products. On the basis of a study of the scientific literature and reports of insurance companies, regulators and self-regulatory organizations, the influence of the following factors on distribution channels for life insurance products is investigated:

– The frequency of internet use (% of individuals) reflects how actively the population uses the internet in everyday life. High internet usage frequency indicates consumers' willingness to interact with insurance companies through online channels, such as websites and mobile apps. The growth of online banking depends on internet speed and frequency of use, and encryption systems increase trust in digital transactions (Geetha & Manivannan, 2024).

– level of urbanization (% of total population) – urban populations generally have better access to financial services and a higher level of financial literacy. This may influence the choice of distribution channels, as both traditional (agents, branches) and digital channels for selling insurance products are more commonly used in cities. Urban areas account for 68% of digital channel adoption, whereas rural areas account for 32% (Beck & Webb, 2002).

– The level of internet access (% of households) determines the technical ability of households to use online services. A high level of internet access contributes to the development of digital distribution channels for insurance products, making them more accessible to a wide range of consumers. Broadband expansion correlates with greater use of formal banking services (Lyons et al., 2017).

– educational attainment, at least completed upper secondary, (% of people) – educated citizens better understand complex financial products and may be more open to using new technologies to purchase insurance services. This affects the effectiveness of both traditional and digital distribution channels. Consumers with higher education are 3.2 times more likely to purchase life insurance because of a better understanding of mortality risk, higher levels of financial literacy and greater trust in digital platforms (Ropponen et al., 2023). Each additional year of education increases the use of financial services by 4 percentage points, regardless of income (Hoang, 2021).

– The index of actual hours worked at the main job (standard units) reflects the level of employment of the population. Citizens with a high workload may prefer quick and convenient channels for purchasing insurance products, such as online platforms, owing to limited time for visiting physical branches or meetings with agents.

1) The input data array is formed in terms of selected indicators, and the data are checked for adequacy via two tests: the Kaiser–Meyer–Olkin test and Bartlett's test. The calculation of the Kaiser–Meyer–Olkin test is carried out via formula (2):

$$I_{KMO} = \frac{\sum_{i \neq j} r_{ij}^2}{\sum_{i \neq j} r_{ij}^2 + \sum_{i \neq j} p_{ij}^2} \quad (2)$$

where I_{KMO} is the Kaiser–Meyer–Olkin index; r_{ij} is an element of the correlation matrix; and p_{ij} is an element of the partial correlation matrix.

The calculation of the Bartlett test statistic is based on formula (3):

$$\chi^2 = - \left(n - 1 - \frac{2p+5}{6} \right) \ln|R| \quad (3)$$

where χ^2 represents Bartlett test statistics; n represents the number of observations; p represents the number of variables; and R represents the correlation matrix.

2) Simplifying the interpretation of factors by rotating factors. The rotation process can be formalized via formula (4):

$$V = \sum_{i=1}^m (\sum_{j=1}^k L_{ij}^4 - \frac{1}{k} (\sum_{j=1}^k L_{ij}^2)^2) \quad (4)$$

where V is the varimax rotation; L_{ij} is the factor loading; m is the number of variables; and k is the number of factors.

3) Interpreting factor loadings by visualizing the impact of each factor via a heatmap and histogram.

Cluster construction on the basis of the Gaussian mixture model and determination of the degree of influence of relevant indicators of influence on the choice of the distribution channel of insurance products on the basis of the Varimax method were carried out via the Python programming language.

4. Results. The distribution methods of insurance products vary significantly across countries depending on their economic development, level of technological infrastructure, cultural characteristics and regulatory conditions. Understanding these differences is important in developing effective insurance product sales policies and finding reserves to improve the efficiency of the insurance business. On the basis of the results of using the program code to build a Gaussian mixture model, 3 groups of European Union countries were identified, which are characterized by similar approaches in the distribution of life insurance products (Table 1).

Table 1. Average values of indicators across 3 clusters of countries.

	Distribution channels, % to total					Target indicators	
	direct writing	agents	brokers	bancassurance	other	density, \$ per inhabitant	penetration, % to GDP
1 st period (2008-2011)							
1 cluster	13.30	15.10	9.00	61.90	4.10	1097.55	4.54
2 cluster	16.60	42.20	30.20	19.60	2.50	889.24	3.09
3 cluster	14.50	4.00	25.00	13.00	43.50	1073.41	3.09
2 nd period (2012-2015)							
1 cluster	10.60	12.80	10.00	63.40	3.30	1 075.78	4.15
2 cluster	22.20	41.30	15.30	25.70	3.80	410.57	1.43
3 cluster	19.40	7.70	45.80	13.80	38.50	2 113.47	5.37
3 rd period (2016-2019)							
1 cluster	8.90	12.80	4.80	66.00	1.30	1 097.42	3.99
2 cluster	21.60	43.60	13.50	28.20	2.30	350.03	1.27
3 cluster	20.30	5.90	45.20	24.50	42.50	2 123.26	5.24

Sources: developed by the authors.

On the basis of the analysis of average indicators in the context of the three formed clusters of countries, key approaches to the sale of life insurance products can be identified:

1) Bancassurance model (cluster 1). In this approach, banks serve as the primary distribution channel for life insurance products. This model is prevalent in regions where banking institutions have built a broad customer base, and the regulatory framework allows for close integration between banking and insurance services. The bancassurance model benefits from banks' trusting relationships with customers, access to financial data for risk assessment, and the ability to bundle insurance with other financial products such as loans and savings accounts. Bancassurance dominance is often observed in markets with highly concentrated banking sectors, where a few large institutions control significant market shares. In countries where bancassurance is the main life insurance distribution channel, banking sector development contributes to integration in terms of revenue efficiency (Cummins & Rubio-Misas, 2021).

2) Intermediary model (cluster 2). This approach to the distribution of life insurance products is characterized by the predominance of independent insurance agents and brokers, who act as intermediaries between insurers and policyholders. Agents typically represent one or more insurers, while brokers offer products from multiple insurers, advising clients on their specific needs. This model dominates markets where insurance is complex and requires personalized advice and individual insurance solutions.

3) Hybrid model (combination of digital channels and brokers) (cluster 3). This approach involves a hybrid distribution model in which independent brokers remain important, but digital platforms play a dominant role in the distribution process of insurance services. This model is being developed in markets with

high internet penetration, tech-savvy consumers and flexible regulation that allows for digital underwriting and contracting. Insurance companies, aggregator websites, and automated advice platforms provide seamless digital experiences, offering real-time policy comparisons, AI-powered risk assessments and direct sales to consumers. The role of brokers in this model is shifting from traditional intermediaries to digital facilitators, who use data analytics and automation to improve policy recommendations and streamline the buying process.

Figure 1 presents the composition of each cluster across the three analysed periods.

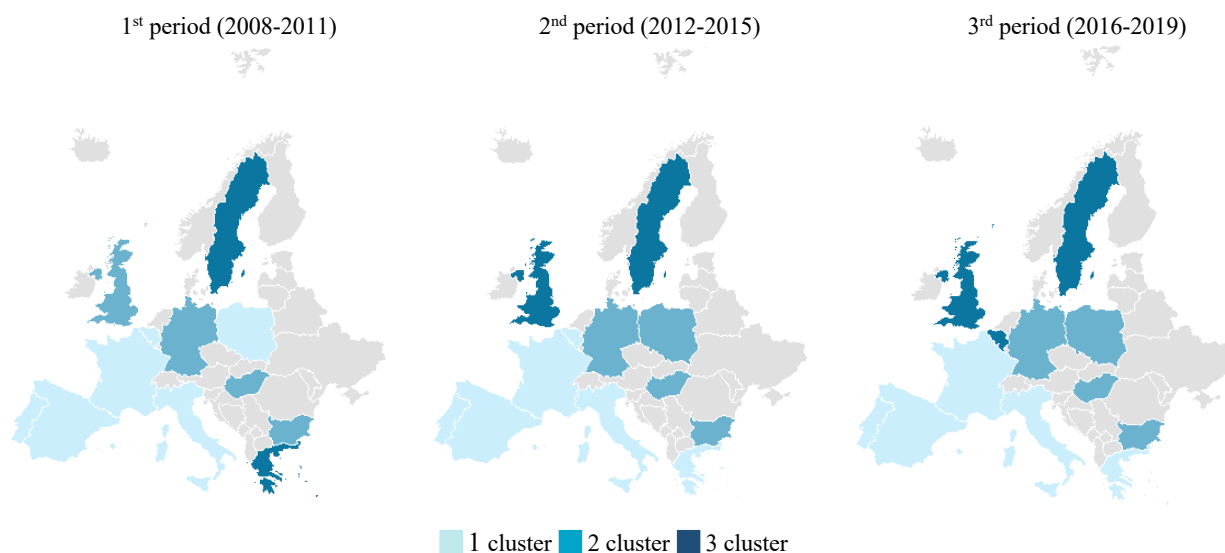


Figure 1. Visualization of clusters of European Union countries by the nature of the distribution of life insurance products.

Sources: developed by the authors.

The data in Figure 1 clearly demonstrate that Cluster 1 includes Spain, France, Italy, Malta and Portugal. These countries are characterized by a bancassurance model of the distribution of life insurance products. The second cluster includes Bulgaria, Germany and Hungary, which are characterized by an intermediary model for selling life insurance products. The third cluster includes Sweden and the United Kingdom, which use a digital brokerage model for selling life insurance products.

An analysis of changes in the cluster distribution indicates the stability of the grouping of most countries, although in some cases, a transition between clusters is observed. In particular, from 2016--2019, Belgium transitioned from the 1st cluster to the 3rd cluster because of the rapid increase in the sale of insurance products through brokers, whereas the share of bank transfers decreased. Starting from the 2nd period (2012--2015), Poland experienced a decrease in the sale of insurance products through the banking network, which caused the country to move from cluster 1 to cluster 2.

The next stage of the study is to determine the degree of influence of relevant factors on the distribution models of life insurance products by using the common factor rotation (Varimax) method. The results of the practical implementation of factor analysis via the varimax method via the Python programming language are presented below.

Figure 2 presents heatmaps that show the strength and direction of factor loadings, which are broken down into 3 clusters. The color of each cell represents the magnitude of the factor loading, with red indicating high positive loading and blue indicating low or no loading.

Analysis of factor loading graphs allows us to state that for all clusters, two variables (frequency of internet use and level of internet access) are largely explained by factor 0, i.e., the level of digital development in the country. On the basis of the values of the factor loading graphs, the degree of influence of each of the analysed indicators was determined in the context of the formed clusters (Fig. 3).

The most significant differences between clusters are observed in the indicators of internet access, education level and hours worked index. Cluster 1 (bancassurance model of distribution of life insurance products) is characterized by a relatively even distribution across all indicators, without pronounced dominance. The highest level of influence on cluster 2 (the intermediary model) is the level of citizens' access to the internet and the level of citizens' education, whereas the lowest level is the index of hours worked. The

factors with the most significant effects on the distribution of life insurance products within cluster 3 (hybrid model) are the frequency of internet use and the level of urbanization.

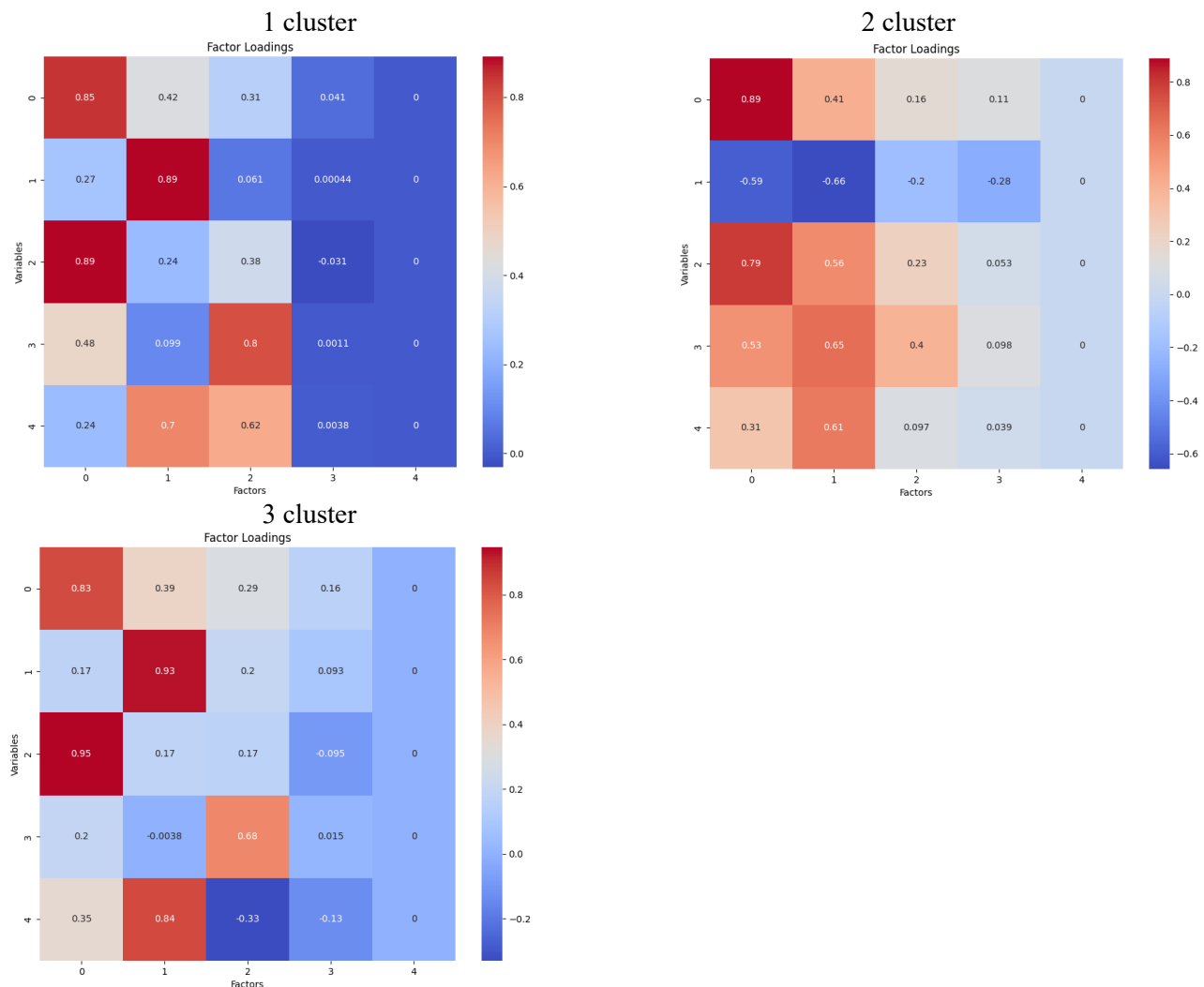


Figure 2. Graphs of factor loadings in the context of 3 clusters.
Sources: developed by the authors.

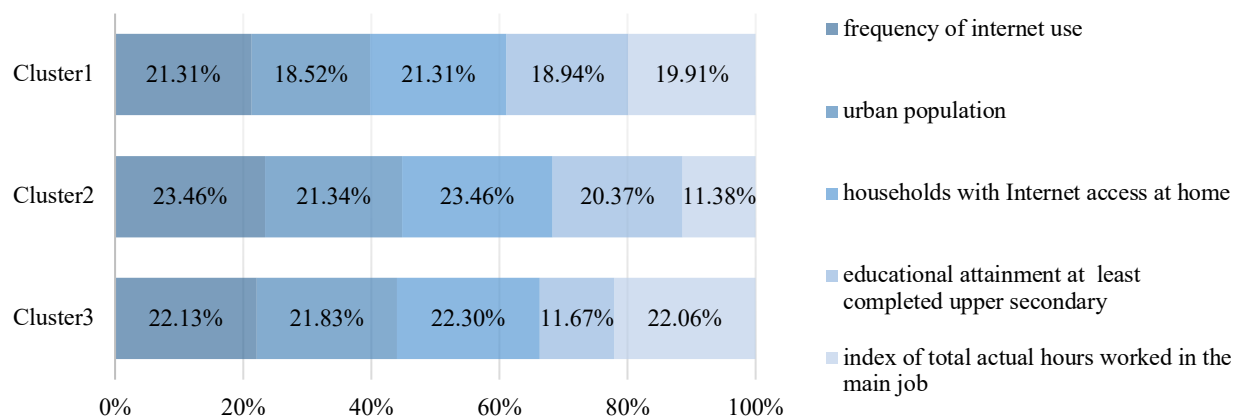


Figure 3. The degree of influence of relevant factors on different distribution models of life insurance products
Sources: developed by the authors.

5. Discussion. The findings of this study provide valuable insights into the diverse landscape of life insurance distribution models across EU countries and the socioeconomic and technological factors

influencing them. By leveraging advanced statistical methods such as Gaussian mixture models and the varimax factor rotation technique, three dominant distribution models—bancassurance, intermediary, and hybrid—and their corresponding country clusters have been successfully identified.

The prevalence of the bancassurance model in countries such as Spain, France, Italy, Malta, and Portugal aligns with the broader trend of leveraging well-established banking networks to distribute insurance products (Hong & Lee, 2014; Rubio-Misas, 2022). This approach capitalizes on the trust and convenience offered by banks, facilitating cross-selling opportunities and enhancing customer retention (Thu Thuy et al., 2023). Notably, the study highlights that digital development indicators, such as internet usage frequency and access, significantly influence this model. This observation confirms earlier literature emphasizing that even traditionally bank-driven markets are increasingly embracing digital channels to complement their services (Geetha & Manivannan, 2024).

In contrast, the intermediary model, which is dominant in Bulgaria, Germany, and Hungary, continues to rely heavily on agents and brokers. This finding reinforces the notion that personal advisory services remain crucial in markets where consumers prefer tailored solutions and human interaction (Cummins & Doherty, 2006; Trigo-Gamarra, 2008). Importantly, the study reveals that internet accessibility and educational attainment are critical enablers in this model. Higher education levels correlate with a better understanding of complex insurance products (Hoang, 2021; Ropponen et al., 2023), whereas internet access supports agents and brokers in enhancing customer engagement and service delivery (Lyons et al., 2017).

The hybrid model, exemplified by Sweden and the United Kingdom, demonstrates the successful fusion of traditional brokerage services with modern digital platforms. This model thrives in environments characterized by high urbanization and advanced digital infrastructure, where consumers demand seamless, tech-enabled experiences (Eling & Lehmann, 2018; Ganapathy, 2023). The integration of digital tools enhances efficiency and responsiveness, enabling insurers and brokers to provide tailored solutions rapidly. This is particularly relevant, as younger, tech-savvy demographics increasingly dominate the consumer base, a trend corroborated by existing studies (Eling & Kraft, 2020).

The dynamic evolution of country clusters over time, such as Belgium's shift from a bancassurance-dominated approach to a hybrid model, reflects the broader digital transformation reshaping the insurance sector (Schmidt et al., 2019). This suggests that while historical models provide a foundational structure, market forces and technological advances continuously drive adaptation. Research underscores the importance of insurers remaining agile, proactively adjusting their distribution strategies, and investing in technological capabilities to sustain competitiveness (Chen, 2021).

Additionally, the identification of critical factors such as labor intensity, urbanization, and education highlights the multifaceted nature of consumer behavior in insurance markets. These variables, often overlooked in distribution strategy discussions, play a significant role in shaping how consumers access and interact with insurance products (Beck & Webb, 2002).

From a practical standpoint, the study offers actionable insights for insurance companies and policymakers. For insurers, tailoring distribution strategies to the unique socioeconomic context of each market can enhance efficiency and customer satisfaction. For policymakers, supporting initiatives that expand internet infrastructure and financial literacy could catalyze the development of more inclusive and innovative insurance markets (Lyons et al., 2017; Hoang, 2021).

Overall, this study bridges an important gap in the understanding of life insurance distribution dynamics within the EU. It moves beyond isolated analyses of individual channels to provide a holistic, data-driven perspective that captures the complexity and fluidity of modern insurance markets. Future research could build upon these findings by incorporating real-time data and exploring the impact of emerging technologies such as AI-driven underwriting and embedded insurance solutions, which are poised to further transform distribution landscapes (Schmidt et al., 2019).

6. Conclusions. The evolution of life insurance distribution channels highlights the need for insurers to adapt to complex and rapidly changing environments. Our study has provided clear evidence of three distinct distribution models across EU countries: 1) the bancassurance model, which is dominant in Spain, France, Italy, Malta, and Portugal and capitalizes on the trust and customer reach of established banking networks; 2) the intermediary model, which is prevalent in Bulgaria, Germany, and Hungary, where independent agents and brokers continue to play a crucial role in providing personalized advisory services; and 3) the hybrid model, which is observed in Sweden and the United Kingdom and combines the strengths of traditional brokerage with advanced digital platforms, reflecting markets with high internet penetration and urbanization.

Through rigorous factor analysis, the study identified key socioeconomic and technological factors shaping these models. Digital development indicators (such as the frequency of internet use and household internet access) were particularly influential for the bancassurance and hybrid models. Moreover, the intermediary model was strongly influenced by citizens' educational levels and internet accessibility, reflecting the importance of consumer financial literacy and the integration of digital tools in advisory services. Urbanization also emerged as a critical factor for the hybrid model, highlighting the role of urban consumers in driving digital adoption.

Theoretically, this research enriches the academic understanding of insurance distribution by proposing an integrated, cross-national typology of distribution models that accounts for technological maturity and socioeconomic diversity. Methodologically, the application of Gaussian mixture models and varimax rotation provides a replicable framework for clustering markets and diagnosing distribution dynamics.

From a practical standpoint, the findings offer actionable insights for insurers and policymakers alike. Insurers can refine their distribution strategies by aligning them with prevailing socioeconomic and technological conditions in target markets. Investments in digital infrastructure, partnerships with banks, and the upskilling of intermediaries are vital to remaining competitive. Policymakers, meanwhile, can promote digital inclusion and financial literacy to foster more equitable access to life insurance products.

For future research, several promising directions have emerged. Applying this methodology to regions beyond the EU would test the universality of our findings and account for different market dynamics, such as those in Asia or Latin America. Furthermore, integrating emerging variables such as AI-driven underwriting, embedded insurance ecosystems, and blockchain-enabled smart contracts will deepen the understanding of how new technologies reshape distribution landscapes.

In conclusion, our study underscores that no single distribution model fits all contexts. The agility of combining models, embracing innovation, and adapting to socioeconomic realities defines the success of life insurers in the future global landscape.

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Моделі каналів дистрибуції у страхуванні життя: ідентифікація факторів впливу

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Індустрія страхування життя зазнає суттєвих трансформацій, зумовлених еволюцією споживчих уподобань, стрімким технологічним прогресом і зміною ринкової динаміки. У процесі адаптації до нових умов моделі каналів дистрибуції набувають критичного значення, визначаючи рівень успішності та прибутковості страховиків. Метою статті є розроблення науково-методичних підходів до обґрунтування моделей дистрибуції продуктів зі страхування життя, що передбачає формування однорідних груп країн та ідентифікацію ключових чинників, які впливають на вибір моделі збуту. У дослідженні застосовано модель гауссової суміші для виявлення кластерів країн за схожістю дистрибуційних структур та метод обертання загальних факторів (Varimax) для оцінювання впливу релевантних соціально-економічних і технологічних показників на відповідні моделі дистрибуції. Дослідження охоплює період 2008–2019 років і базується на даних із 13 країн Європейського Союзу. Обчислення виконано з використанням мови програмування Python. На основі кластерного аналізу виділено три ключові моделі збуту страхових продуктів: банкострахувальну (Іспанія, Франція, Італія, Мальта, Португалія), посередницьку (Болгарія, Німеччина, Угорщина) та гібридну (Швеція, Велика Британія). Аналіз динаміки кластеризації свідчить про відносну стабільність розподілу більшості країн за моделями, хоча в окремих випадках зафіксовано переходи між групами. Дослідження подібностей і відмінностей між країнами, а також впливу цифрових і соціально-економічних чинників, дозволяє розробити ефективні дистрибуційні

стратегії в умовах динамічного страхового ринку. За результатами факторного аналізу, найбільші відмінності між кластерами виявлено за показниками доступу до Інтернету, рівня освіти та індексу фактично відпрацьованих годин. Зокрема, на банкострахувальну модель найбільше впливають показники цифрового розвитку (частота користування Інтернетом, рівень доступу до Інтернету), на посередницьку – рівень доступу до Інтернету та освіта громадян, а на гібридну – частота користування Інтернетом і рівень урбанізації. Отримані результати мають практичне значення для страхових компаній і фінансових установ, які прагнуть оптимізувати свої канали збуту та адаптуватися до сучасних умов ринку

Ключові слова: канали дистрибуції; страхування життя; страхові брокери; страхові агенти; страхові премії.