Degree of insurance markets integration based on the case of the EU-15 countries[1]

Marzanna Lament,[a] Sławomir Bukowski[b]

Abstract. The international integration of insurance markets plays an important role in the development of these markets. EU directives freed insurance companies from the requirement to regulate prices and insurance conditions, while also removing other competition-related regulatory obstacles. However, legal systems as well as institutional and cultural features still differ significantly across EU countries. According to the basic concept of financial market integration, the law of one price applies. This means that assets generating identical cash flows have the same price (rate of return) within an integrated financial market. The insurance market is characterised by certain specificity arising from the diversity and complexity of insurance contracts, causing difficulty in assessing integration processes. Consequently, issues related to the integration of the insurance market are poorly recognised and require more in-depth research.

The aim of the study discussed in the article is to examine to what degree the insurance markets in the EU-15 countries are integrated. The study period covers the years 1999–2021. The data have been extracted from the databases of OECD Statistics and the European Insurance Occupational Pensions Authority. The measures of the integration of insurance markets have been determined with regard to gross written premium and investments. The empirical analysis was based on statistical and econometric methods and indicated a high level of insurance markets integration of the EU-15 countries. The measurement was based on integration indicators, which showed a further upward trend.

Keywords: insurance, insurance companies, integration of insurance markets, EU-15 countries, written premium, investments

JEL: F31, G22, G32, M21

Stopień integracji rynków ubezpieczeniowych na przykładzie krajów UE-15

Streszczenie. Międzynarodowa integracja rynków ubezpieczeniowych odgrywa ważną rolę w ich rozwoju. Dyrektywy Unii Europejskiej zniosły regulacje dotyczące cen i warunków ubezpieczeń. Usunięte zostały także inne regulacyjne przeszkody dla konkurencyjności, ale

---

[a] Uniwersytet Radomski im. Kazimierza Pułaskiego, Wydział Ekonomii i Finansów, Polska / Casimir Pulaski Radom University, Faculty of Economics and Finance, Poland.
ORCID: https://orcid.org/0000-0003-3450-5122. Autor korespondencyjny / Corresponding author, e-mail: m.lament@uthrad.pl.

[b] Uniwersytet Radomski im. Kazimierza Pułaskiego, Wydział Ekonomii i Finansów, Polska / Casimir Pulaski Radom University, Faculty of Economics and Finance, Poland.
ORCID: https://orcid.org/0000-0001-8039-895X. E-mail: s.bukowski@uthrad.pl.

trzeba brać pod uwagę, że kraje UE nadal są znacznie zróżnicowane pod względem systemów prawnych oraz cech instytucjonalnych i kulturowych. Podstawowym założeniem integracji rynków finansowych jest prawo jednej ceny, co oznacza, że na zintegrowanych rynkach aktywa generujące identyczne przepływy pieniężne mają tę samą cenę (stopę zwrotu). Rynek ubezpieczeniowy charakteryzuje się specyfiką wynikającą ze zróżnicowania i złożoności umów ubezpieczenia, która utrudnia ocenę procesów integracyjnych, dlatego zagadnienia z tym związane stanowią słabo rozpoznany obszar badawczy.

Celem badania omawianego w artykule jest ocena stopnia integracji rynków ubezpieczeniowych w krajach UE-15. Badanie obejmowało lata 1999–2021. Dane uzyskano z baz OECD Statistics oraz European Insurance Occupational Pensions Authority. Miary integracji rynków ubezpieczeniowych zostały ustalone w odniesieniu do składki przypisanej brutto oraz do inwestycji firm ubezpieczeniowych. Analiza empiryczna, przeprowadzona z wykorzystaniem metod statystycznych i ekonometrycznych, pozwala stwierdzić, że stopień integracji rynków ubezpieczeniowych krajów UE-15 mierzony przyjętymi wskaźnikami jest wysoki i że obserwuje się tendencję do jego dalszego wzrostu.

Słowa kluczowe: ubezpieczenia, firmy ubezpieczeniowe, integracja rynków ubezpieczeniowych, kraje UE-15, składka przypisana, inwestycje

1. Introduction

Measuring the integration of insurance markets is one of the most popular issues currently studied in the field of insurance market research. At the same time, the literature relating to this topic indicates that it has been poorly investigated. This is due to the fact that the insurance market is characterised by certain specificities which make it difficult to assess integration processes. A fundamental problem is the complexity of insurance contracts, both in terms of their duration (long- and short-term) and their diverse coverage (property, motor, health, life, and others). In addition, the differences in insurance terms and their individualisation cause difficulties in comparing their prices, i.e. the insurance premium. In other words, different terms and conditions of an insurance contract may be offered for the same price, which is the result of both negotiation and the performance of any previous insurance contracts. In the area of insurance, a comparison of the price of a product in the same way as, for example, in banking (comparing interest rates on deposits or bank loans) is not possible.

One of the stages of insurance market integration was the implementation of the third Generation Directives (Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance other than life assurance and amending Directives 73/239/EEC and 88/357/EEC and Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life assurance and amending Directives 79/267/EEC and 90/619/EEC), which introduced a single EU licence. According to the directive, an insurer licenced in one EU country can do business in all EU countries without the need to obtain additional licences or adhere to host countries' regulations. The Directives also abolished substantive

insurance supervision, freeing insurers from the regulation of prices and conditions, as well as removing other regulatory impediments relating to competition. However, legal systems and institutional and cultural characteristics still differ significantly across EU countries (e.g. Berry-Stölzle et al., 2013; Bikker & Gorter, 2011; Bukowski & Lament, 2020; Cummins et al., 2017; Cummins & Venard, 2008).

The integration of insurance markets was studied mainly as one of the factors influencing these markets' development and efficiency with the aim to improve their functioning (e.g. Anđelić et al., 2010; Bukowski & Lament, 2020; Kozarević et al., 2013; Njegomir & Marović, 2012). The analysis of the literature on the subject shows that the research conducted so far has not in principle assessed the degree of insurance markets integration, except the research presented by Bukowski and Lament (2022). Insurance market integration measures have been established with regard to gross written premium (II_g) and investments of insurance companies (Q_g). In this paper, we use these measures in the analysis of the insurance markets integration in the EU-15 countries.

The aim of the study discussed in this article is to examine the degree of insurance markets integration among EU-15 countries. This article fills the existing research gap in assessing the degree of insurance markets integration. Such research had already been conducted by Bukowski and Lament (2022, 2023) in relation to the insurance markets of the EU and the euro area, while this paper focuses on a homogeneous group of countries with well-developed insurance markets.

2. Literature review

The process of insurance markets integration can be examined from a legal and financial perspective.

The phenomenon of insurance market integration in legal terms is both the subject of regulation (the adaptation of national regulations to supranational regulations) and of scientific and research analyses (e.g. Fedor, 2005; Gąsiorkiewicz & Monkiewicz, 2020; Monkiewicz, 2005; Monkiewicz & Monkiewicz, 2005, 2021; Monkiewicz & Wanat-Połeć, 2005; Nissim, 2010).

From the financial point of view, it is important to analyse real-life insurance market integration and demonstrate that such processes actually do take place, and to examine the degree of this integration. It is not an easy issue to study. Contrary to the banking sector, where it is possible to analyse the interest rate on individual types of loans or the interest rate on deposits, in the insurance sector, one cannot directly analyse the prices of insurance protection (insurance premiums) for individual types of insurance, or the value of claims and benefits from individual types of insurance.

In the insurance sector, a differentiation of risk occurs, even within individual types of insurance and different insurance conditions. This means that the insurance premium (the price of the insurance cover) varies depending on the scope of the cover. Thus, a thorough analysis and unambiguous comparison of insurance offers is problematic. The diversified scope of insurance coverage causes prices to vary. The prices are therefore difficult to compare unequivocally, even for a given type of insurance within one national market. Since it is challenging to determine whether there is a single price in the insurance market, the possibility of assessing the degree of the integration of the insurance market is also complicated. Research into the integration of the insurance market has been carried out by a variety of scientists, including: Anđelić et al. (2010); Bukowski and Lament (2022); Cummins and Rubio-Misas (2018); Cummins and Rubio-Misas (2022); Giantsios and Noulas (2020); Jurkiewicz and Wycinka (2006); Kozarević et al. (2013); Njegomir and Marović (2012); Schoenmaker and Sass (2016). The extent of the research conducted by the above-mentioned authors and its results are presented in Table 1.

The analysis of the literature on the subject shows that the research so far has not in principle assessed the degree of insurance markets integration, except the work by Bukowski and Lament (2022). In the existing research, the integration of insurance markets was treated mainly as one of the factors influencing the development and improvement of the efficiency of these markets. Two studies: by Jurkiewicz and Wycinka (2006) and Kozarević et al. (2013) do actually concern the assessment of the degree of insurance markets integration although the applied methodology does not form a comprehensive approach, but only covers selected issues. Research by Anđelić et al. (2010), Kozarević et al. (2013) and Njegomir and Marović (2012) indicate that the insurance market integration influences the development of that market.

Table 1. Insurance market integration: literature review

Research paper	Scope of research	Research methods	Research results
Jurkiewicz & Wycinka (2006)	Evaluation of the level of European markets integration in 1999 by means of two groups of variables. The first group shows the importance of insurance markets to the economy (premium/GDP, investment/GDP, investments in shares / market capitalisation, insurance employment / service, premium per inhabitant, insurance employment per inhabitant). The other group of variables describe the structure of insurance markets (provisions/premium ratio, number of companies per 1,000 inhabitants, share of the five largest life insurance companies, share of the five largest non-life insurance companies, share of life premium in the total premium, share of life investment in total insurance investments, life investments / life premium, non-life investments / non-life premium, share of motor premium in the total premium)	Multivariate statistical methods (the Pearson correlation index, k-mean clustering, factor analysis, Self Organising Map)	The findings show that the European insurance market is integrated on a very low level
Anđelić et al. (2010)	Analysis of the influence of globalisation on the insurance and reinsurance markets of Eastern Europe in 2000–2008	Econometrics method	The results confirm the significance of the relationship between globalisation trends and changes in the insurance and reinsurance markets of Eastern Europe. Integration is one of the factors which influences the development of insurance markets
Njegomir & Marović (2012)	Identification of five key trends in the insurance market which affect the insurance industry and the activity of insurance companies. These are integration processes, which encompass globalisation, consolidation and convergence, intensified catastrophic events, and new risks, mainly caused by emerging technologies	Econometrics method	Integration proves to be one of the factors which influences insurance markets development

Table 1. Insurance market integration: literature review (cont.)

Research paper	Scope of research	Research methods	Research results
Kozarević et al. (2013)	Process of the integration of Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo and Serbia, Montenegro, Former Yugoslav Republic of Macedonia) into the EU in 2002–2011	Spearman's coefficient of rank correlation, used to measure the correlation between the development and the integration into the EU	The authors conclude there is a strong positive correlation between the insurance development in the Western Balkan states and the process of their European integration
Schoenmaker & Sass (2016)	Internationalisation of insurance groups and identification of a certain scope for the supervision of problems associated with internationalisation	Econometrics method	The empirical findings suggest a high degree of cross-border penetration in European insurance. This high and increasing degree of internationalisation of European insurance groups poses a challenge for supervision – it may tilt the supervisory balance
Cummins & Rubio-Misas (2018)	Impact of integration on the efficiency of EU life insurance markets in 1998–2011	Data Envelopment Analysis (DEA) and panel data models. Evaluation of the dynamics of efficiencies obtained by DEA, a non-parametric frontier approach. In the analysis, efficiency is measured by comparing firms to 'best practice' efficient frontiers formed by the most efficient firms in the industry	Financial market development, legal and governmental systems, as well as competitive intensity are found to affect insurance market performance and integration. The EU deregulation policies have succeeded in improving the efficiency and performance of life insurance sectors
Giantsios & Noulas (2020)	Estimation of the revenue efficiency and efficiency convergence for 22 EU insurance markets during the financial crisis and in the years following it, i.e. in 2006–2014	Dynamic panel data models. In estimating the level of convergence, the concepts of β-convergence and σ-convergence were used	The results show that the average revenue efficiency is found to be relatively stable over the period of 2006–2014 with a noticeable reduction for the period of 2006–2008 due to the global financial crisis

Table 1. Insurance market integration: literature review (cont.)

Research paper	Scope of research	Research methods	Research results
Bukowski & Lament (2022)	Insurance markets integration in the EU (1999–2019) and analysis of the correlation between the insurance markets integration and economic growth in the EU, especially in the euro area (1999–2019). The influence of the monetary policy on the insurance market and the degree of insurance markets integration	Providing a definition of insurance markets integration. Presentation of the main measures concerning the degree of insurance market integration Econometrics method	The ratios of the insurance markets' integration both in the whole EU and in the euro area are very similar, though somewhat higher in the latter. There is a rather strong positive, and statistically significant impact of the variations of Ilg and Qg on economic growth in the EU countries. The situation in the euro area is similar, although the effect of the Ilg variable (ratio) is statistically insignificant, whereas the impact of Qg changes depending on the rate of economic growth is statistically significant and quite strong
Cummins & Rubio-Misas (2022)	Analysis of the integration and convergence both in efficiency and the technology gap of 10 EU life insurance markets over the period of 2008–2014	Meta-frontier DEA	Results show convergence in cost/revenue efficiency among major EU life insurance markets during the sample period. The global crisis (2007–2009) has led to a slowdown in the progress of the integration and convergence in efficiency and the technology gap of EU life insurance markets in terms of cost efficiency but not in terms of revenue efficiency

Source: authors' work.

3. Research method

The object of the research is to assess the degree of insurance markets integration. The scope of the research covers the insurance markets of the EU-15 countries, i.e.: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. The insurance market of the EU-15 countries is one of the most developed and constitutes a homogeneous research group, which is an important argument from the point of view of studying their integration. The research period covers the years 1999–2021.

The research used annual financial data on insurance markets from the OECD Statistics[2] and European Insurance Occupational Pensions Authority (EIOPA)[3] databases. The analysis of the obtained results was carried out using the STATISTICA 13 and GRETL software.

The proposed measures for assessing the degree of the integration of insurance markets are based on the written premium and investments. The written premium is the income of an insurance company and forms the basis for many assessment indicators, as well as the price of the insurance cover. The written premium was divided into some groups of insurance market participants (domestic residents, foreign residents) and insurance products (life insurance and non-life insurance). The proposed indicator relates the written premium to the number of the population.

Investments of insurance companies consist of the investments of the given country's insurance companies abroad and the investments of foreign insurance companies in the given country. The proposed indicators refer to the insurance penetration rate and insurance density rate. However, a different scope of the written premium is worth noting. In the proposed measure, it includes the premium in a broader sense: from domestic residents and foreign residents. The classic insurance density rate includes insurance companies operating in a given insurance market. The second proposed indicator relates investments to GDP. The classic insurance penetration rate compares the insurance premium to GDP.

A higher value of the indicator means a higher degree of integration of an insurance market into the group of n countries in period t.

We have presented our concept of the measures of the degree of insurance markets integration in the book entitled *Insurance Markets Integration in the European Union* (Bukowski & Lament, 2022).

We assume that a higher integration degree of country i's insurance market with foreign markets means a higher share of the written premium from insurance for foreign residents abroad in the total written premium of the domestic companies in

---

[2] https://stats.oecd.org.

[3] https://www.eiopa.europa.eu/tools-and-data/insurance-statistics_en.

country i. To begin with, we propose the following approach: we assume that one of the main indicators in the field of insurance is the written premium. We treat this indicator as a base for the construction of the insurance markets integration indicators.

The main variables (in USD) are as follows:

$WP_{hi,t}$ is total written premium of domestic companies from the insurance for domestic residents in country i in period t,

$WP_{fi,t}$ is total written premium of domestic companies from insurance for foreign residents abroad in the region (domestic company directly) in country i in period t,

$WP^L_{hi,t}$ is written premium of domestic companies from the insurance for domestic residents in country i in period t – life insurance,

$WP^P_{hi,t}$ is written premium of domestic companies from the insurance for domestic residents in country i in period t – non-life insurance,

$WP^L_{fi,t}$ is written premium of domestic companies from insurance for foreign residents abroad (domestic company directly) in country i in period t – life insurance,

$WP^P_{fi,t}$ is written premium of domestic companies from insurance for foreign residents abroad (domestic company directly) in country i in period t – non-life insurance,

$WP^T_{hfi,t}$ is total written premium of domestic companies from the insurance for domestic and foreign residents in country i in period t.

The following formulas show the relationship between the variables:

$$WP_{hi,t} = WP^L_{hi,t} + WP^P_{hi,t}, \tag{1}$$

$$WP_{fi,t} = WP^L_{fi,t} + WP^P_{fi,t}, \tag{2}$$

$$WP^T_{hfi,t} = WP_{hi,t} + WP_{fi,t}, \tag{3}$$

$$II_{i,t} = \frac{WP_{fi,t}}{WP^T_{hfi,t}}, \tag{4}$$

where $II_{i,t}$ is the degree of integration of country i in period t with foreign insurance markets in terms of the written premium.

A higher value of the indicator means a higher degree of country i integration with foreign insurance markets in period t.

For all groups of countries

$$II_g = \frac{\sum_{i=1}^{n} II_{i,t} d_{i,t}}{\sum_{i=1}^{n} d_{i,t}}, \tag{5}$$

where:
II_g is the degree of integration of insurance markets determined on the basis of written premiums,
$d_{i,t}$ is number of inhabitants in country i in period t as the weight.

As mentioned before, a higher value of the indicator means a higher degree of integration of the insurance market into the group of n countries (for example the EU, the euro area countries) in period t.

We also propose other indicators based on the concept of the quantity-based indicators:

$$Q_{i,t}^{P} = \frac{PI_{i,t}^{h} + PI_{i,t}^{f}}{GDP_{i,t}}, \tag{6}$$

where:
$Q_{i,t}^{P}$　　is the degree of integration of country i in period t with foreign investment insurance markets,
$PI_{i,t}^{h}$　　is the portfolio investment of country i's insurance companies abroad in period t (in USD),
$PI_{i,t}^{f}$　　is the portfolio investment of foreign insurance companies in country i in period t (in USD),
$GDP_{i,t}$　is GDP in country i in period t (in USD).

A higher value of the indicator means a higher degree of country i's integration into foreign insurance markets in period t.

For the group of countries:

$$Q_g = \frac{\sum_{i=1}^{n} Q_{i,t}^{P} d_{i,t}}{\sum_{i=1}^{n} d_{i,t}}, \tag{7}$$

where:
Q_g　is the degree of integration of insurance markets as determined by investments,
$d_{i,t}$　is number of inhabitants in country i in period t as the weight.

A higher value of the indicator means a higher degree of integration of an insurance market with the group of n countries (e.g. the EU, the countries of the euro area) in period t (Bukowski & Lament, 2022, p. 100).

In the analysis presented in this paper the above-mentioned measures of the insurance markets integration in the EU-15 countries have been adopted.

4. Results

In order to illustrate the extent of the variables concerning the studied insurance markets and their distribution in the examined period, Tables 2 and 3, as well as Figures 1 and 2 contain the key statistics relating to these variables.

Table 2. Basic statistics on the studied variables concerning the EU-15 insurance markets in 1999–2021: gross written premium

Specification	$WP_{hi,t}$	$WP_{hi,t}^{L}$	$WP_{hi,t}^{P}$	$WP_{fi,t}$	$WP_{fi,t}^{L}$	$WP_{fi,t}^{P}$
	in millions of USD					
Average	91,221.38	53,866.33	36,721.64	11,987.56	7,163.29	4,963.86
Median........................	37,423.64	23,185.84	13,751.45	1,997.94	333.29	1,614.45
Maximum....................	654,582.32	538,215.85	239,876.34	84,512.75	63,298.31	29,495.82
Minimum....................	2,356.46	1,171.44	742.13	0.00	0.00	0.00
Variance.....................	1.33E+10	5.78E+09	2.54E+09	509,323,881	256,825,256	56,245,412
Standard deviation	116,142.00	75,632.47	49,367.75	22,687.82	16,156.64	7,516.27

Note. The variables are explained in the *Research method* section. *N* (size of the sample) = 345.
Source: authors' work based on data from the OECD Statistics.

The analysis of the data on the evolution of insurance premiums in the insurance markets of the EU-15 countries from 1999 to 2021 included in Table 2 and in Figure 1 shows that they are internally differentiated. This is indicated by the variance and standard deviation, which illustrate the dispersion around the mean. The reason behind the discrepancies in the distributions of the studied variables is the wide variation of the countries studied in terms of insurance market development. The EU-15 states are the most economically developed countries in the EU. However, they differ internally due to the historical and demographic conditions of their development. As a result, insurance markets vary in terms of size, number of operators and scope of insurance products.

Figure 1. Selected basic statistics on the studied variables concerning the EU-15
insurance markets in 1999–2021: gross written premium

in billions of USD
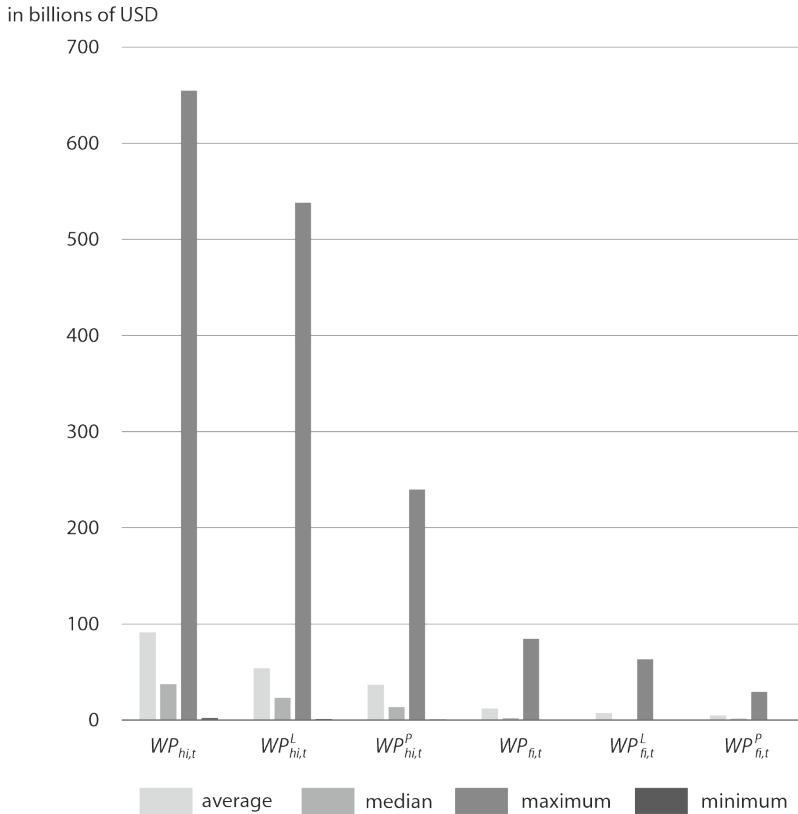
Note. The variables are explained in the *Research method* section.
Source: authors' work based on data from the OECD Statistics.

The differences in the development of insurance markets are reflected in the different value and dynamics of insurance premiums, investment values or financial performance, and other elements. Thus, the development of the insurance market is a result of both the economic development of the country, the demographic structure of the population and the insurance awareness, as well as insurance market capacity. This is confirmed by an analysis of the studied insurance market of the EU-15 countries, which includes economically more developed countries with stable insurance markets, with a large number of players, e.g. Belgium, France, Germany and Luxembourg, as well as economically less developed countries with smaller insurance markets, e.g. Greece and Portugal. The indicated economic dissimilarities of the EU-15 countries are an important reason for the diversity of the studied variables characterising these countries' insurance markets.

Table 3 and Figure 2 present the basic statistics characterising the examined variables concerning the investments of insurance companies operating in the EU-15 insurance markets between 1999 and 2021.

Table 3. Basic statistics concerning the studied variables of the EU-15 insurance markets in 1999–2021: investments of insurance companies

Specification	$PI_{i,t}^h$	$PI_{i,t}^f$
	in millions of USD	
Average	44,193.72	72,857.85
Median..........................	6,238.74	36,946.74
Maximum......................	389,148.80	393,583.50
Minimum	0.00	544.62
Variance........................	5.56E+09	7.35E+09
Standard deviation...	74,295.62	86,821.24

Note. As in Table 2.
Source: authors' work based on data from the OECD Statistics.

Figure 2. Selected basic statistics on the studied variables concerning the EU-15 insurance markets in 1999–2021: investments of insurance companies
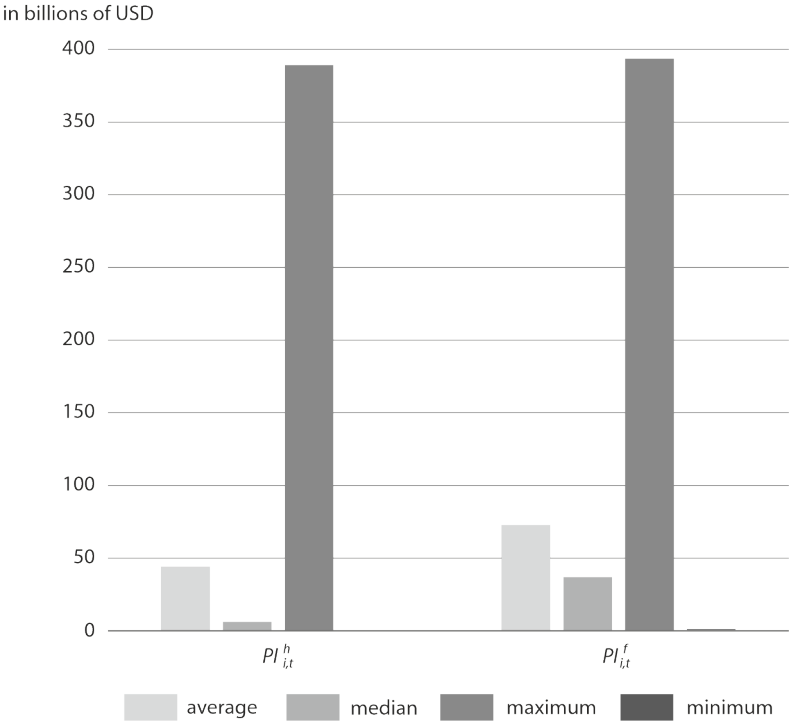

Note. The variables are explained in the *Research method* section.
Source: authors' work based on data from the OECD Statistics.

As with the premium data, the analysis of the investment data concerning insurance companies operating on the EU-15 insurance markets from 1999 to 2021, shows that they are internally diverse. This is indicated by the variance and standard deviation, which illustrate dispersion around the mean. The reasons for the discrepancies in the distributions of the variables can be traced back to the wide variation in the countries in question in terms of insurance market development which is described in the part of the paper concerning the development of insurance premiums. It should be noted that the level of investments of insurance companies is derived from the insurance premium and varies according to the size of the premium. Thus, the reasons for the diversity of investments in the surveyed insurance market of the EU-15 countries are the same as the reasons for the diversity of insurance premiums, i.e. they result from macroeconomic and demographic factors, and also depend on the degree of the development of a country's insurance market.

Figure 3 presents the integration of insurance markets in the EU-15 countries in the years 1999–2021.

Figure 3. Degree of insurance markets integration in the UE-15 countries
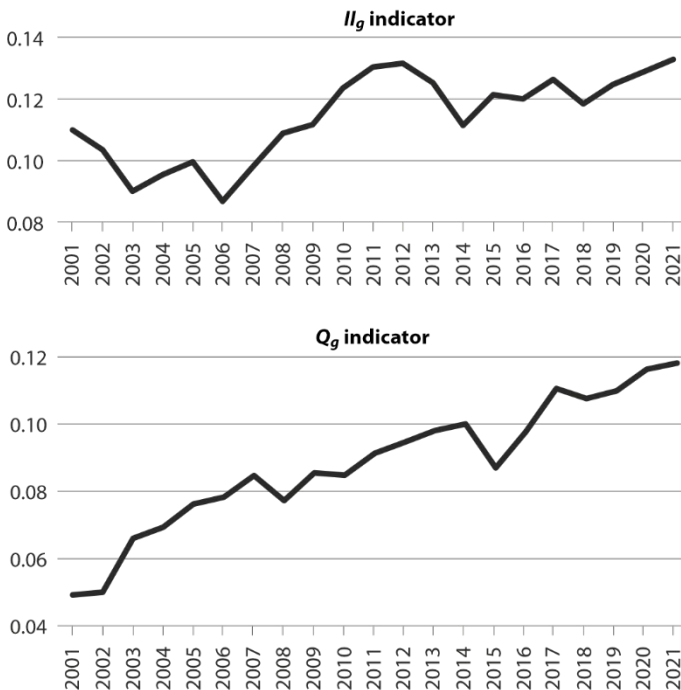
Source: authors' work based on data from the OECD Statistics and EIOPA.

Both II_g and Q_g indicate, generally, an increase in the integration degree of insurance markets from 1999 to 2021. However, there were also periods when the degree of integration decreased (as e.g. in 2014–2017). At this stage of our research it is difficult to determine the reasons for this situation. In contrast to equity markets, government bonds, corporate bonds, credit and deposit markets, there has been no negative impact of the financial and fiscal crisis (2007–2009) in the EU on integration processes of insurance markets.

It is worth noting that in the case of the research covering all EU member states, as well as the research relating to euro area countries only, the trends in the degree of the integration of insurance markets are similar (see Bukowski & Lament, 2022, pp. 117–119). It should be noted, however, that the increase in the indicators of the degree of the integration of insurance markets for the research of EU-15 countries was characterised by greater stability and lower dynamics of change than the indicators relating to all member states and euro area countries. This applies to both the II_g and Q_g indicators. In other words, the integration processes of insurance markets in the surveyed group of EU-15 countries were more balanced and less intensive, which may be due to the similarity of the institutional and cultural characteristics of the insurance markets of the countries studied.

Differences in the indication of the II_g and Q_g measure can also be observed, which is normal, because each of the two indicators is based on different variables. A similar situation can be observed in the case of the synthetic measures of the degree of financial markets integration, which are applied in the report (Bukowski, 2020).

The research concerning the degree of insurance market integration calls for expansion exceeding the so far primarily studied legal issues and problems of insurance market regulation within the EU (also evident in the literature, e.g. Fedor, 2005; Gąsiorkiewicz & Monkiewicz, 2020; Monkiewicz, 2005; Monkiewicz & Monkiewicz, 2005, 2021; Monkiewicz & Wanat-Połeć, 2005; Nissim, 2010). Apart from the work by Bukowski and Lament (2022, 2023), no research has in principle assessed the extent to which the insurance market is integrated. The results of this study show that the proposed indicators based on the written premium and mutual foreign investment between countries are good introductory measures of insurance markets integration.

5. Conclusions

This article focused on the study of EU-15 countries forming a group of homogeneous insurance markets and representing a similar level of economic development.

The empirical analysis in this article, based on statistical and econometric methods, suggests that the degree of the insurance markets integration measured by means of

the gross written premium and investment of insurance companies ratios is high and tends to increase across the EU-15 countries. The obtained research results are consistent with those of Bukowski and Lament (2022) for the insurance markets of EU member states and euro area countries.

Subsequent research should focus on testing the developed measures for a more in-depth assessment of the degree to which insurance markets are integrated and include other groups of insurance markets. This will be the subject of further research soon to be undertaken by the authors of the article.

References

Anđelić, G. B., Ćosić, I., & Đaković, V. (2010). The Impact of Globalization on the Insurance and Reinsurance Market of Eastern Europe. *South East European Journal of Economics and Business*, *5*(1), 95–112. https://doi.org/10.2478/v10033-010-0010-7.

Berry-Stölzle, T. R., Hoyt, R. E., & Wende, S. (2013). Capital Market Development, Competition, Property Rights, and the Value of Insurer Product-Line Diversification: A Cross-Country Analysis. *Journal of Risk and Insurance*, *80*(2), 423–459. https://doi.org/10.1111/j.1539-6975 .2012.01470.x.

Bikker, J. A., & Gorter, J. (2011). Restructuring of the Dutch Nonlife Insurance Industry: Consolidation, Organizational Form, and Focus. *Journal of Risk and Insurance, 78*(1), 163–184. https://doi.org/10.1111/j.1539-6975.2010.01369.x.

Bukowski, S. I. (2020). *Financial Integration in the European Monetary Union*. Routledge. https://doi.org/10.4324/9780429200496.

Bukowski, S. I., & Lament, M. (2020). Foreign capital impact on insurance market development in EU-15 countries. *Entrepreneurial Business and Economics Review*, *8*(3), 206–219. https://doi.org/10.15678/EBER.2020.080312.

Bukowski, S. I., & Lament, M. B. (2022). *Insurance Markets Integration in the European Union*. Routledge. https://doi.org/10.4324/9781003227762.

Bukowski, S. I., & Lament, M. B. (2023). Integracja rynków ubezpieczeniowych – przykład krajów Europy Środkowo-Wschodniej należących do Unii Europejskiej. *Ekonomista,* (4), 387–402. https://doi.org/10.52335/ekon/174759.

Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance other than life assurance and amending Directives 73/239/EEC and 88/357/EEC (third non-life insurance Directive) (Official Journal of the European Communities L 228/1, from 11th August 1992).

Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life assurance and amending Directives 79/267/EEC and 90/619/EEC (third life assurance Directive) (Official Journal of the European Communities L 360/1, from 9th December 1992).

Cummins, J. D., & Rubio-Misas, M. (2018). *Integration and efficiency convergence in European life insurance markets*. https://www.efmaefm.org/0efmameetings/efma%20annual%20meetings /2018-Milan/papers/EFMA2018_0482_fullpaper.pdf.

Cummins, J. D., & Rubio-Misas, M. (2022). Integration and convergence in efficiency and technology gap of European life insurance markets. *Annals of Operations Research*, *315*(1), 93–119. https://doi.org/10.1007/s10479-022-04672-w.

Cummins, J. D., Rubio-Misas, M., & Vencappa, D. (2017). Competition, efficiency and soundness in European life insurance markets. *Journal of Financial Stability, 28*(1), 68–78. https://doi.org/10.1016/j.jfs.2016.11.007.

Cummins, J. D., & Venard, B. (2008). Insurance market dynamics: between global developments and local contingencies. *Risk Management and Insurance Review, 11*(2), 295–326. https://doi.org/10.1111/j.1540-6296.2008.00142.x.

Fedor, M. (2005). Nowe standardy rachunkowości i nadzoru. In J. Monkiewicz (Ed.), *Jednolity rynek ubezpieczeń w Unii Europejskiej. Procesy rozwoju i integracji* (pp. 130–142). Oficyna Wydawnicza Branta.

Gąsiorkiewicz, L., & Monkiewicz, J. (Eds.). (2020). *Innovation in financial services. Balancing public and private interests.* Routledge. https://doi.org/10.4324/9781003051664.

Giantsios, D. G., & Noulas, A. G. (2020). Efficiency and Convergence in the European Life Insurance Industry. *Multinational Finance Journal*, *24*(1/2), 65–91.

Jurkiewicz, T., & Wycinka, E. (2006). Evaluation of the degree of integration among European insurance markets. *Acta Universitatis Lodziensis. Folia Oeconomica, 196*, 277–290.

Kozarević, S., Kozarević, E., & Šiljegović, E. (2013). Insurance market development in the context of integration to the European Union: a case of the Western Balkans. *International Journal of Economic Perspectives*, *7*(1), 9–23.

Monkiewicz, M. (2005). Regulacyjna baza jednolitego rynku ubezpieczeń Unii Europejskiej. In J. Monkiewicz (Ed.), *Jednolity rynek ubezpieczeń w Unii Europejskiej. Procesy rozwoju i integracji* (pp. 65–82). Oficyna Wydawnicza Branta.

Monkiewicz, J., & Monkiewicz, M. (2005). Jednolity rynek finansowy Unii Europejskiej. In J. Monkiewicz (Ed.), *Jednolity rynek ubezpieczeń w Unii Europejskiej. Procesy rozwoju i integracji* (pp. 45–64). Oficyna Wydawnicza Branta.

Monkiewicz, J., & Monkiewicz, M. (2021). Regulatory and supervisory systems and financial innovations: challenges, impacts, prospects. In L. Gąsiorkiewicz & J. Monkiewicz (Eds.), *Innovation in Financial Services. Balancing Public and Private Interests* (pp. 113–129). Routledge. https://doi.org/10.4324/9781003051664.

Monkiewicz, J., & Wanat-Połeć, E. (2005). Nadzór nad jednolitym rynkiem ubezpieczeń w Unii Europejskiej. In J. Monkiewicz (Ed.), *Jednolity rynek ubezpieczeń w Unii Europejskiej. Procesy rozwoju i integracji* (pp. 145–167). Oficyna Wydawnicza Branta.

Nissim, D. (2010). *Analysis and Valuation of Insurance Companies* (Industry Study Number Two). Columbia Business School, Center for Excellence in Accounting and Security. https://www.columbia.edu/~dn75/Analysis%20and%20Valuation%20of%20Insurance%20Companies%20-%20Final.pdf.

Njegomir, V., & Marović, B. (2012). Contemporary trends in the global insurance industry. *Procedia – Social and Behavioral Sciences, 44*, 134–142. https://doi.org/10.1016/j.sbspro.2012.05.013.

Schoenmaker, D., & Sass, J. (2016). Cross-Border Insurance in Europe: Challenges for Supervision. *The Geneva Papers on Risk and Insurance – Issues and Practice*, *41*(3), 351–377. https://doi.org/10.1057/gpp.2015.35.