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DZIAŁ SPECJALNY: 30 LAT FUNDAMENTALNYCH ZASAD
STATYSTYKI PUBLICZNEJ

SPECIAL SECTION: 30 YEARS OF THE FUNDAMENTAL PRINCIPLES
OF OFFICIAL STATISTICS

CZERWIEC / JUNE
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STATISTICS POLAND

POLSKIE TOWARZYSTWO STATYSTYCZNE
POLISH STATISTICAL ASSOCIATION



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tel./phone +48 22 608 32 25, e-mail: redakcja.ws@stat.gov.pl

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OD REDAKCJI

W czerwcowym numerze „Wiadomości Statystycznych. The Polish Statistician” proponujemy Państwu lekturę nie tylko artykułów prezentujących wyniki badań przeprowadzonych z użyciem metod statystycznych, lecz także prac poświęconych *Fundamentalnym zasadom statystyki publicznej* (Fundamental Principles of Official Statistics – FPOS). Dla uczczenia 30-lecia opracowania statystycznych standardów Organizacji Narodów Zjednoczonych zaprosiliśmy autorów z całego świata, aby podzielili się doświadczeniami i refleksjami związanymi ze stosowaniem FPOS, a dla nadesłanych prac o tej tematyce utworzyliśmy okolicznościowy dział.

W artykule *Degree of insurance markets integration based on the case of the EU-15 countries* dr hab. Marzanna Lament, prof. URad, i prof. dr hab. Sławomir Bukowski przedstawiają wyniki badania rynków ubezpieczeniowych w 15 krajach UE przeprowadzonego z użyciem miar ustalonych w odniesieniu do składki przypisanej brutto i inwestycji firm ubezpieczeniowych. Autorzy wykorzystują dane za lata 1999–2021 pobrane z baz OECD Statistics i European Insurance Occupational Pensions Authority. Na podstawie analizy empirycznej, przeprowadzonej z użyciem metod statystycznych i ekonometrycznych, stwierdzają, że stopień integracji rynków ubezpieczeniowych krajów UE-15 mierzony za pomocą przyjętych wskaźników jest wysoki i wykazuje tendencję wzrostową.

Dr Abdulaziz Abduvaliev w pracy *The effectiveness of innovation development reforms in Uzbekistan* odnosi się do procesów transformacji gospodarczej i społecznej w Uzbekistanie w latach 2013–2022. Analizuje zmiany dotyczące liczby przedsiębiorstw i organizacji wytwarzających innowacyjne towary i prace oraz świadczących usługi we własnym zakresie w przemyśle wytwórczym, a także liczby specjalistów w sektorze badawczo-rozwojowym. Zauważa, że w analizowanym obszarze osiągnięto pewne pozytywne rezultaty, choć ocena sfery innowacji wskazuje na potrzebę bardziej pogłębionych reform. Szczególną uwagę – w opinii autora – należy poświęcić zaawansowanej technologii, której rozwój w rozpatrywanym okresie utrzymywał się na najniższym poziomie.

The Fundamental Principles of Official Statistics as the basis for a social information environment in the globalised world to temat pracy prof. dr. hab. Józefa Oleńskiego, jednego z twórców FPOS. Autor opisuje genezę statystycznych standardów ONZ oraz ich znaczenie w procesie przekształcania krajowych i lokalnych systemów statystyki publicznej w globalny system informacyjny. Podkreśla, że FPOS powinny być wykorzystywane jako podstawa do tworzenia prawa penalizującego generowanie danych i metadanych niespełniających cywilizacyjnych kryteriów jakości: prawdy, społecznej użyteczności i minimalnej nadmiarowości.

Z kolei Eric Rancourt w artykule *The evolution of Statistics Canada's stance on Fundamental Principles of Official Statistics: from peripheral to central* opisuje kanadyjskie doświadczenia związane ze stosowaniem FPOS. Przedstawia proces stopniowego wdrażania standardów ONZ oraz wskazuje zasady o priorytetowym znaczeniu dla optymalnej organizacji i harmonizacji systemu statystycznego kraju ze światowym systemem statystyki publicznej. Podkreśla, że FPOS tworzą solidne fundamenty procesów statystycznych potrzebne w trudnych czasach – tym bardziej że pryncypia te akceptują również politycy, co powinno zapewnić klarowność decyzji i spójność działań.

W numerze nie mogło także zabraknąć omówienia najnowszych publikacji GUS. Zestawienie przygotowała Joanna Sadowy.

Życzymy miłej lektury.

FROM THE EDITORIAL TEAM

The June issue of *Wiadomości Statystyczne. The Polish Statistician* features not only articles presenting research results based on statistical methods, but also papers focusing on the Fundamental Principles of Official Statistics (FPOS). To celebrate the 30th anniversary of the establishment of the United Nations statistical standards, we have invited authors from around the world to share their experiences and reflections related to FPOS, thus creating a special section containing articles dedicated to this topic.

In the article *Degree of insurance markets integration based on the case of the EU-15 countries*, Marzanna Lament, PhD, DSc, Professor at the Casimir Pulaski Radom University, and Sławomir Bukowski, PhD, DSc, ProfTit, present research results of insurance markets in the EU-15 countries carried out using measures established for gross written premiums and investments of insurance companies. The authors use data for the 1999–2021 period, downloaded from the OECD Statistics and the European Insurance Occupational Pensions Authority databases. The empirical analysis performed using statistical and econometric methods indicated a high level of integration of insurance markets of the EU-15 countries, additionally showing a further upward trend.

Abdulaziz Abduvaliev, PhD, in his article *The effectiveness of innovation development reforms in Uzbekistan* examines the processes of this country's economic and social transformation in the years 2013–2022. The author analyses changes in the number of enterprises and institutions manufacturing innovative products and works and those providing services of their own in the manufacturing industry, as well as in the number of research specialists in the Research & Development sector (R&D). He observes that some positive results were achieved in the studied area, although a broader analysis of the innovation sphere indicates the need for more in-depth reforms. In the author's opinion, special attention should be devoted to high technology, as the level of its development in the studied period was the lowest.

In *The Fundamental Principles of Official Statistics as the basis for a social information environment in the globalised world* by Józef Oleński, PhD, DSc, ProfTit, one of the creators of FPOS, the author presents the roots of the United Nations statistical standards and their role in the process of transforming the national and local structures of official statistics into a global information system. He points out that FPOS should be used as a basis for making laws that would penalise generating data and metadata that do not meet the civilisational criteria for quality, i.e. the criterion of truth, social utility and minimal redundancy.

Eric Rancourt in his paper *The evolution of Statistics Canada's stance on Fundamental Principles of Official Statistics: from peripheral to central* describes the Canadian experience connected to the adoption of FPOS. The author presents the process of Canada's gradual implementation of the UN standards and selects those principles that are crucial for the optimal organisation and harmonisation of the statistical systems of particular countries with the global system of official statistics. He argues that FPOS build solid foundations for statistical processes that are necessary in troubled times, and even more so as politicians accept these principles as well. The latter phenomenon, according to the author, should guarantee the transparency of decisions and coherence of actions.

The issue concludes with the presentation of Statistics Poland's most recent publications prepared by Joanna Sadowy.

We wish you a pleasant reading.

Degree of insurance markets integration based on the case of the EU-15 countries¹

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

¹ Artykuł został opracowany na podstawie referatu wygłoszonego na 40th International Conference MSA'2022 joined with MASEP, która odbyła się w dniach 7–9 listopada 2022 r. w Łodzi / The article is based on a paper delivered at the 40th International Conference MSA'2022 joined with MASEP, held on 7–9 November 2022 in Łódź, Poland.

^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 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; Gąsioriewicz & 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, <i>k</i> -mean clustering, factor analysis, Self Organising Map)	The findings show that the European insurance market is integrated on a very low level
Andelić 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 Statistics² 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 ,

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

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

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

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

$WP_{hfi,t}^T$ 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:

$$WP_{hi,t} = WP_{hi,t}^L + WP_{hi,t}^P, \quad (1)$$

$$WP_{fi,t} = WP_{fi,t}^L + WP_{fi,t}^P, \quad (2)$$

$$WP_{hfi,t}^T = WP_{hi,t} + WP_{fi,t}, \quad (3)$$

$$II_{i,t} = \frac{WP_{fi,t}}{WP_{hfi,t}^T}, \quad (4)$$

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

$$I_g = \frac{\sum_{i=1}^n I_{i,t} d_{i,t}}{\sum_{i=1}^n d_{i,t}}, \quad (5)$$

where:

I_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:

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

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:

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

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

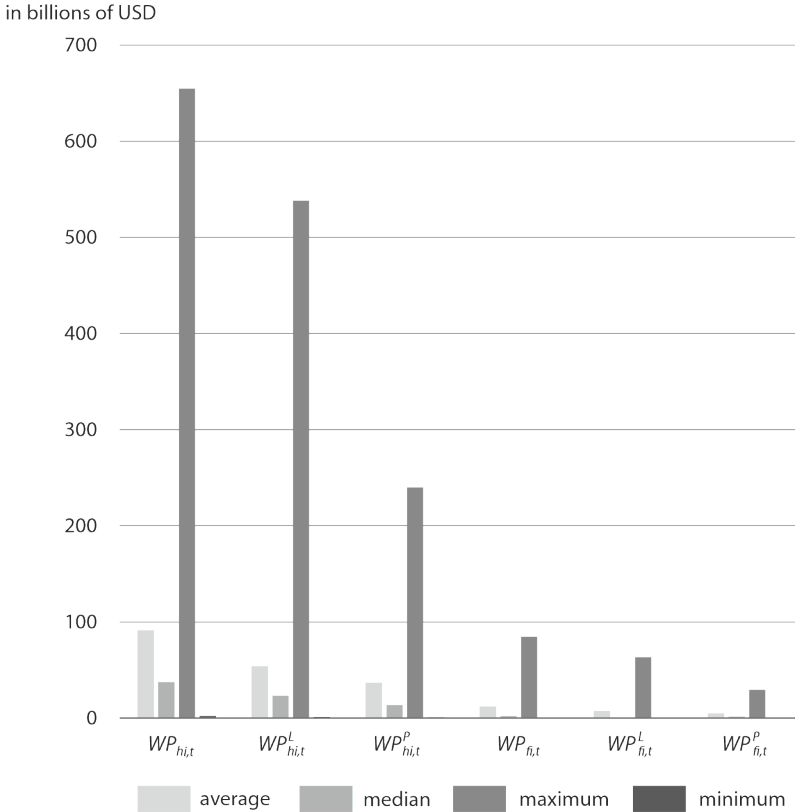
Specification	$WP_{hi,t}$	$WP_{hi,t}^L$	$WP_{hi,t}^P$	$WP_{fi,t}$	$WP_{fi,t}^L$	$WP_{fi,t}^P$
	in millions of USD					
Average	91,221.38	53,866.33	36,721.64	11,987.56	7,163.29	4,963.86
Median	37,423.64	23,185.84	13,751.45	1,997.94	333.29	1,614.45
Maximum	654,582.32	538,215.85	239,876.34	84,512.75	63,298.31	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



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.

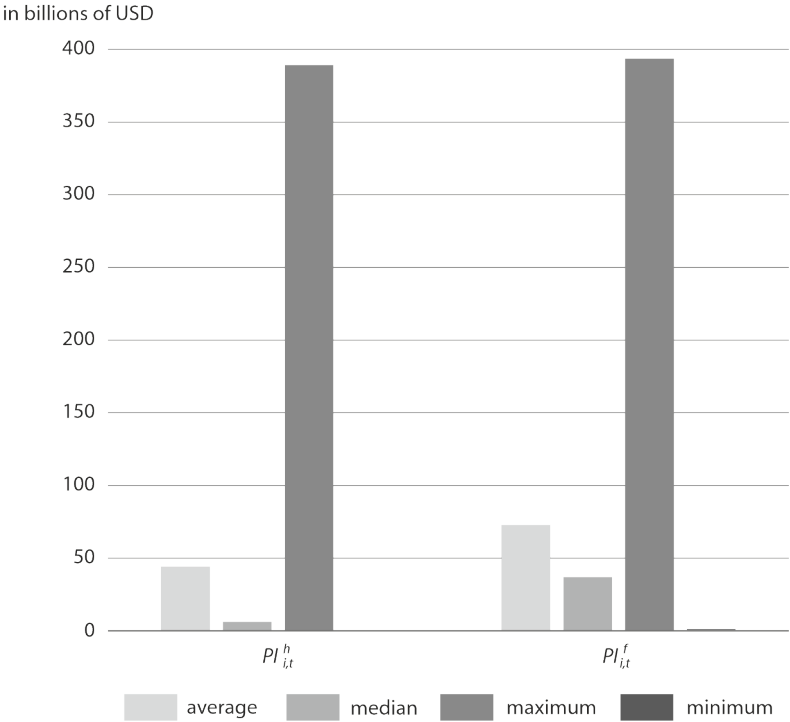
Table 3. Basic statistics concerning the studied variables of the EU-15 insurance markets in 1999–2021: investments of insurance companies

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



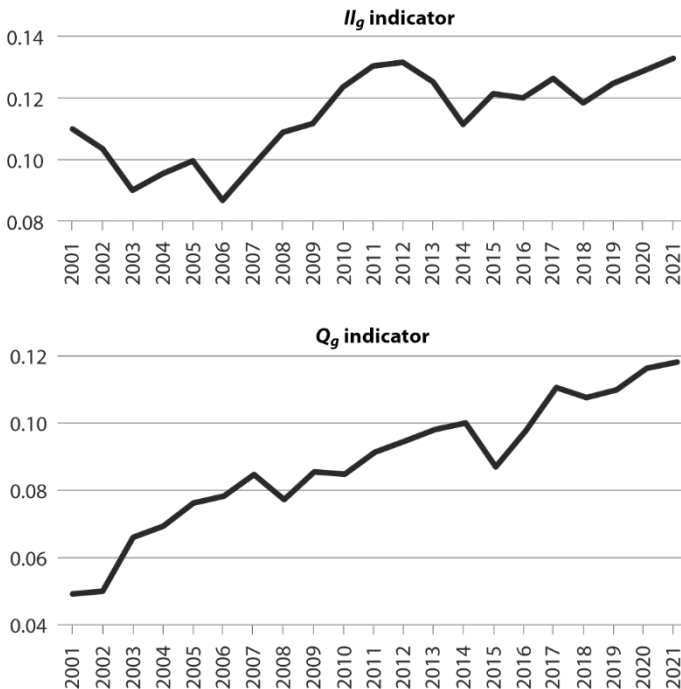
Note. The variables are explained in the *Research method* section.

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; Gąsioriewicz & 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.

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The effectiveness of innovation development reforms in Uzbekistan

Abdulaziz Abduvaliev^a

Abstract. The ongoing large-scale reforms implemented in all areas of the socio-economic, environmental and political spheres of Uzbekistan are directly related to the tasks defined by Sustainable Development Goals (SDGs). One of the key directions in the development of Uzbekistan involves the formation of an innovative economy. The aim of the study discussed in the article is the assessment of the effectiveness of ongoing reforms and the results achieved in the development of an innovative economy in the country. The conducted research is of an empirical character and based on the analysis of official statistics and data provided by a variety of international organisations for the years 2013–2022.

The study analyses the number of enterprises and organisations producing innovative goods and works and providing services of their own in the manufacturing industry, and the number of research specialists (also by specialisation) in Research & Development (R&D). The research shows that some positive results were achieved in this area, although a broader analysis of the innovation sphere reveals a need for more in-depth reforms. Special attention should be devoted to high technology, as the level of its development in the studied period remained the lowest.

Keywords: economy, innovation, research and development, R&D, industry, Sustainable Development Goals

JEL: F60, F63, O38

Skuteczność reform w zakresie rozwoju innowacyjności w Uzbekistanie

Streszczenie. We wszystkich obszarach sfery społeczno-gospodarczej, ochrony środowiska i politycznej Uzbekistanu na szeroką skalę wdrażane są reformy, które wynikają bezpośrednio z zadań określonych przez Cele Zrównoważonego Rozwoju (SDGs). Jeden z kluczowych kierunków rozwoju kraju jest związany z tworzeniem innowacyjnej gospodarki. Celem badania omawianego w artykule jest ocena skuteczności reform w zakresie rozwoju innowacyjnej gospodarki podejmowanych przez rząd Uzbekistanu. W badaniu wykorzystano dane za lata 2013–2022, publikowane przez centralny urząd statystyczny Uzbekistanu oraz udostępniane przez organizację międzynarodową.

Przeanalizowano zmiany dotyczące liczby przedsiębiorstw i organizacji wytwarzających innowacyjne towary, wykonujących innowacyjne prace oraz świadczących usługi w przemyśle wytwórczym, a także liczbę pracowników naukowych (również według specjalności) zaangażowanych w działalność badawczo-rozwojową (B+R). Badanie pokazuje, że osiągnięto pewne pozytywne wyniki w tym zakresie, choć szersza analiza sfery innowacji ukazuje potrzebę

^a Institute for Advanced Training and Statistical Research under the Statistics Agency of the President of the Republic of Uzbekistan, Uzbekistan. ORCID: <https://orcid.org/0000-0001-8712-1902>.
E-mail: abduvaliev06051981@gmail.com.

przeprowadzenia bardziej dogłębnych reform. Szczególną uwagę należy poświęcić zaawansowanym technologiom, ponieważ ich rozwój w badanym okresie pozostawał na najniższym poziomie.

Słowa kluczowe: gospodarka, innowacje, działalność badawczo-rozwojowa, B+R, przemysł, Cele Zrównoważonego Rozwoju

1. Introduction

The purpose of this article is to analyse the reforms introduced in the process of the formation of an innovative economy, which ultimately cover all spheres of the socio-economic development of Uzbekistan.

Thus, the article analyses the most relevant areas reflecting the development of innovation in the country considering that the implemented reforms are directly based on the tasks defined by the Sustainable Development Goals (SDGs).

The 2023 'Technology and Innovation report' presented during the United Nations Conference on Trade and Development stated that innovations and advanced technologies should contribute to meeting the changing needs of humanity (United Nations [UN], 2023).

Innovation is central to supporting a sustainable and inclusive growth of an economy and is the main facilitator of the transition to a circular economy. By generating and effectively transferring knowledge and technologies, innovation can help reduce inequalities and encourage greater value creation for growth and employment, and overall prosperity (UN, 2022).

In order to prevent various cataclysms, entailing negative socio-economic, political and environmental changes, on 25th September 2015 the UN adopted the Sustainable Development Goals 2030. This document defines 17 goals and outlines 169 tasks within the most important areas for humanity today. All 17 SDGs contain elements of relating to the development of innovation although Goal 9 is specifically dedicated to sustainable infrastructure, industrial development and the promotion of innovation. Goal 9.5.1 refers to the increase in research and development (R&D) spending, while Goal 9.5.2 to the increase in the number of researchers (Dutta et al., 2023).

2. Literature review

The theoretical foundations of the formation and development of innovation and its socio-economic importance have been researched by many scientists worldwide. Based on the study of numerous definitions of innovation, it should be noted that there is no single and generally accepted theoretical definition of the idea. This allows the conclusion that innovation is a multifaceted concept that covers all areas of socio-economic, environmental and humanitarian life.

The author of the concept of innovation in economics was an Austrian and American economist, Schumpeter (1962, pp. 81–85), who defined innovation and invention in his teachings.

Innovation, as defined by Cooke and Mayers (1996), is a full cycle of turning an idea into a finished product before its implementation on the market.

In the process of studying industry and commercialisation of technological processes, Maclaurin (1949) identified the factors influencing the technological development of the industry. Manzoor et al. (2023), describe innovation as the main force of economic well-being and study the internal mechanisms and measures of its impact on well-being.

In their research, Myers and Marquis (1969) divide innovation into several types, e.g.: including fast, slow, declining, stable, growth and changing innovation.

Gramma-Vigouroux et al. (2024) studied the driving forces and barriers in SDGs implementation in the context of national innovation ecosystems (NIEs). According to the authors, at the NIE level, the driving forces for the participants and institutions involved in the process, such as compliance, environmental innovation, intersectoral cooperation and human resources are hindered by certain barriers which include the lack of networking skills, institutional gaps, totalitarian power and academic rigidity.

Tu et al. (2023) attempted to explain how such economic activities as corporate social responsibility, eco-friendly supplier management, internal eco-friendly management and eco-friendly customer management affect reaching SDGs based on the analysis of data concerning seven developing countries. The results of the study showed a positive correlation between the above-mentioned economic activities and the achievement of the SDGs.

Guo et al. (2022), basing their research on the example of a Chinese province (within the framework of the provincial twinning programmes), proved that mutual support between provinces involving the flow of talent, capital and technological achievements is crucial for accelerating the process of poverty reduction. The study led the researchers to the conclusion that if a developed country, a major technological power or a large company supports and trains a less developed state to take full advantage of global public goods through this type of individual assistance programmes, then it could significantly contribute to global sustainable development.

Vatananan-Thesenvitz et al. (2019) used the scientific mapping method to evaluate 1,690 articles on innovations in the context of sustainable development, extracted from journals listed in the Scopus database. This way, the authors identified the size, growth trajectory and geographical distribution of the literature on sustainable development.

The research by Cordova and Celone (2019) reveals the relationship between innovation and SDGs in an industrial environment. SDGs are also analysed in terms of the reactions of the stakeholders involved, companies and citizens. The results of the study indicated companies' growing interest in SDGs.

3. Research method

The object of this study is the reforms carried out in Uzbekistan in the framework of the SDGs. The subject of the study is the trend of the development of innovation in Uzbekistan.

The analysed period covers the years 2013–2022 and the research is based on official and open data extracted from the Statistics Agency of the President of the Republic of Uzbekistan, as well as data from the Global Innovation Index.

The conducted research involves an empirical analysis, statistical analysis and indicators of scientific and innovation development of the Republic of Uzbekistan.

4. Results and discussion

As noted by the President of the Republic of Uzbekistan Shavkat Mirziyoyev (O'zbekiston Milliy axborot agentligi, n.d.): 'We have set ourselves the goal of joining a number of developed countries and will be able to achieve it only by carrying out accelerated reforms based on science, education and innovation.'

Today, reforms are being carried out in Uzbekistan to ensure the completion of the tasks defined by the SDGs, within the framework of which the regulatory, institutional and economic foundations are being developed. The proposal of the President Mirziyoyev, i.e. the resolution 'On strengthening the role of parliament in accelerating the achievement of the Sustainable Development Goals', introduced at the 75th Assembly of the UN (14th December 2022), was particularly important, as within the framework of this resolution, a special roadmap for the years 2023–2024 was adopted in order for Uzbekistan to achieve the set SDGs.

In particular, in order to implement certain SDG tasks, the Cabinet of Ministers of Uzbekistan adopted the Resolution No. 841 of 20th October 2018 'On measures to implement national goals and objectives in the field of sustainable development until 2030', which defined the SDGs-related assignments to be completed by the relevant organisations and ministries.

It is important to note that the foundations of Uzbekistan's innovation development are laid down in such strategic documents as:

- Decree of the President of the Republic of Uzbekistan No. UP-158 of 11th September 2023 'On the Strategy Uzbekistan-2030' (further referred to as 'Uzbekistan-2030' strategy);
- 'Strategy of Actions on five priority areas of development of the Republic of Uzbekistan in 2017–2021' (Decree of the President of the Republic of Uzbekistan No. PF-4947 of 7th February 2017 'On the Strategy of Actions for the further development of the Republic of Uzbekistan');

- Decree of the President of the Republic of Uzbekistan No. PF-5264 of 29th November 2017 ‘On the establishment of the Ministry of Innovative Development of the Republic of Uzbekistan’;
- strategies for innovation development of Uzbekistan for 2019–2021 (Decree of the President of the Republic of Uzbekistan No. PF-5544 of 21st September 2018 ‘On approval of the innovative development strategy of the Republic of Uzbekistan in 2019–2021’) and 2022–2026 (Decree of the President of the Republic of Uzbekistan No. PF-60 of 28th January 2022 ‘On the development strategy of New Uzbekistan for 2022–2026’),
and more.

In order to ensure the regulatory framework for the development of science and innovation in the years 2018–2022, 88 documents were adopted in the country, including 2 laws, 34 decrees and resolutions of the President, and 52 resolutions and orders of the Cabinet of Ministers.

The implementation of the tasks defined in the above-listed documents served as the basis for large-scale reforms in this area. Thus, in order to improve the system of financing innovation activities, the Fund for Financing Science and Innovation Support was created in the structures of the Ministry of Innovative Development. These funds aimed to:

- finance the creation and implementation of innovations on a competitive basis by subjects involved in innovative activity;
- finance research, innovation, development and start-up projects on a competitive basis;
- finance the commercialisation of the results of scientific and scientific-technical activities;
- finance equipping scientific laboratories with modern high-tech equipment;
- cover the costs of registration abroad and maintenance of intellectual property rights (patents), created within the framework of state programmes of scientific activity;
- cover the expenses of ensuring the free use of leading electronic databases of scientific data by research and higher educational institutions, as well as prepare scientific results to be issued in international publications;
- finance the creation of scientific and innovative accelerators and business incubators;
- ensure advanced training of gifted young people in prestigious research centres, universities, technology parks and industrial organisations in developed countries;

- conduct scientific and practical events (symposiums, conferences, seminars, trainings, round tables, master classes and others), as well as assure young scientists' participation in international events;
- finance internships of young researchers in leading foreign scientific organisations (centres, universities, and others);
- cover expenses (wages, transportation and other expenses) of highly-qualified specialists from foreign countries attracted by the Ministry of Innovative Development of the Republic of Uzbekistan, etc.

In order to introduce venture financing and attract financial resources from business entities for the implementation of innovative projects, the UzVC National Venture Fund was established by Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 684 of 3rd November 2020 'On measures to organise the activities of the national venture fund UzVC'; the purpose of the resolution is to create the infrastructure necessary to support innovative ideas and a start-up ecosystem. The aim of the Fund is to finance venture projects of legal entities and individuals, also those carried out in partnership with foreign entities.

Relevant steps have been taken to develop innovative activities in the country's regions. Innovation centres are located in territorial centres; together with the regional administration, joint competitions are held to finance scientific and innovative projects. The winning projects are financed in equal parts from the state budget and the local budgets. As a result, 137 projects were implemented until December 2021, upon the completion of which 1,290 new jobs were to be created. To date, as part of the implementation of these projects, 80 companies have produced 230 types of products.

A system of the commercialisation of scientific developments has been created thanks to the Decision of the President of the Republic of Uzbekistan No. PQ-3855 of 14th July 2018 'On additional measures to increase the efficiency of commercialisation of the results of scientific and scientific and technical activities'. This system aims to ensure an accelerated implementation of domestic scientific, applied and innovative projects and developments, increasing the contribution of science to strengthening the competitiveness of the country's economy; additionally, the purpose of the system is to create effective mechanisms for promoting promising domestic achievements in scientific and innovative activities.

Special attention is paid to attracting young people to the field of science and innovation. In accordance with Decree of the President of the Republic of Uzbekistan No. PQ-4433 of 30th August 2019 'On measures to improve the system of attracting young people to the field of science and supporting their initiatives', the Youth Academy was established under the Ministry of Innovative Development.

The Youth Academy promotes the initiatives of gifted young people, strengthens the potential of the existing scientific schools, as well as the development of their innovative potential.

To support and stimulate the scientific and creative potential of the members of the Youth Academy four platforms were created:

- Idea Generators – for teams having their own innovative ideas, aimed at solving a specific problem corresponding to the main directions of the Youth Academy;
- Start-ups – for teams developing their own ideas and start-up projects aimed at implementing real ideas based on a specific plan for their realisation;
- Business Representatives – for teams applying scientific and innovative achievements in their activities, showing at least one year of experience in the relevant field;
- Future Academics – a platform of scientists with a high scientific potential who actively participate in the above-mentioned platforms, making a great contribution to the development of science in the country.

As part of the activities of the Youth Academy, a total of six major competitions were organised, 115 projects were implemented, upon the completion of which 567 new jobs were created.

By Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, No. 133 of 9th March 2020 ‘On measures to further improve the regulatory framework for the development of scientific research and innovative activities’, the regulation ‘On the procedure for approving, financing and implementing start-up projects’ was adopted. It defines the basic concepts and principles of their realisation. The start-up projects approved in accordance with this regulation are financed through the Fund for Support of Innovative Development and Innovative Ideas, as well as from funds allocated to the Ministry from the state budget.

In order to strengthen the achieved results and define new goals for the development of scientific and innovative activities, the ‘Uzbekistan-2030’ strategy was issued. One of the goals of the decree was for Uzbekistan to join the group of countries with an above-average income through sustainable economic development. As part of the implementation of this goal, the scientific and innovation development tasks were also listed in the Table.

Table. Scientific and innovation development goals outlined in the reform of the education system of the 'Uzbekistan-2030' strategy

Goal	Performance indicators of the goals to be achieved by 2030
Supplementing fundamental research with new directions based on modern requirements	<ul style="list-style-type: none"> • conducting basic research • establishing cooperation with eight leading foreign scientific schools in the field of fundamental research • allocation of funds for scientific programmes in the fields of language and literature, history, archaeology, culture and art
Strengthening applied research in the most rapidly developing sectors of the economy, the introduction of the 'enterprise – university – scientific organisation' cluster system	<ul style="list-style-type: none"> • setting the direction of the state budget-funded expenses associated with applied research • production of 850 types of innovative products in areas driving the economy • creation of over 2,500 new scientific developments based on the results of applied research • creation of eight scientific and production clusters in such areas as transport and logistics, agricultural productivity, energy, biotechnology, geology and metalworking, mechanical engineering and electronics
Increasing the proportion of young researchers, supporting their scientific research	<ul style="list-style-type: none"> • bringing the proportion of researchers under the age of 40 to at least 60%, at least doubling the salaries of employees of scientific organisations, on average • bringing to 20 the number of annual competitions for financing scientific, applied, innovative and start-up projects • bringing the number of quotas for research interns, basic doctoral studies, doctoral studies and targeted doctoral studies to 5,200
Widespread implementation of innovative activities in all directions, providing support for scientific research and innovative initiatives	<ul style="list-style-type: none"> • ensuring the inclusion of Uzbekistan in the list of top 50 countries in the Global Innovation Index ranking • bringing the number of researchers for every million people to 2,000 • a two-fold increase in the number of new innovation developments created as a result of commercialisation in the domestic and foreign markets

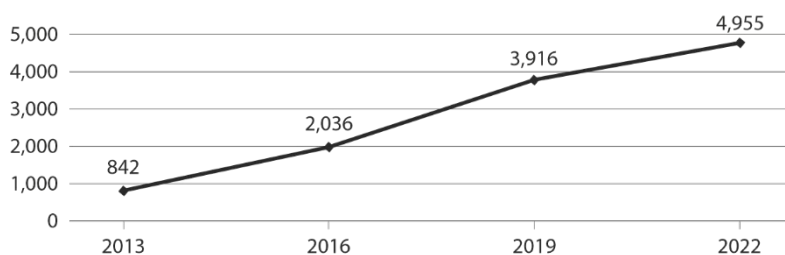
Source: author's work based on a literature review.

The goals and performance indicators listed in the 'Uzbekistan-2030' strategy are complex in nature and determine the priority directions for the development of the innovation infrastructure in Uzbekistan.

The effectiveness of the reforms carried out in the recent years in the field of scientific and innovation development allows the identification of positive trends in the key indicators, including the number of enterprises and organisations producing innovative goods and services, also in industry, as well as the number of specialists and researchers working in R&D.

For example, in the period of 2013–2022, the number of enterprises and organisations producing innovative goods and works and providing services of their own increased by 4,113 units (Figure 1).

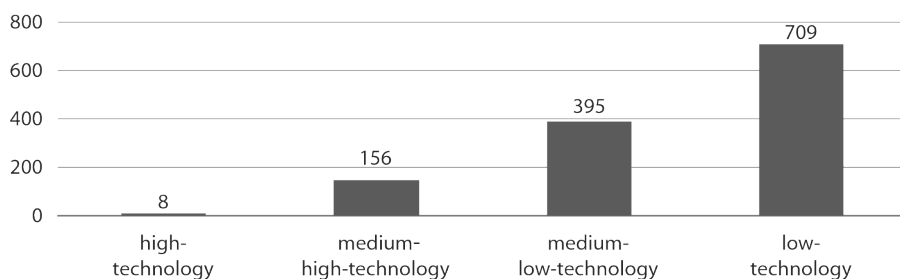
Figure 1. Number of enterprises and organisations that produced innovative goods and works and provided services of their own



Source: author's work.

Moreover, during the analysed period, there was a quantitative growth of enterprises and organisations in the manufacturing industry, which produced goods and works and provided services of their own. Their number increased by 1,268 units (Figure 2).

Figure 2. Increase in the number of enterprises and organisations that produced innovative goods and works and provided services of their own in the manufacturing industry in 2013–2022

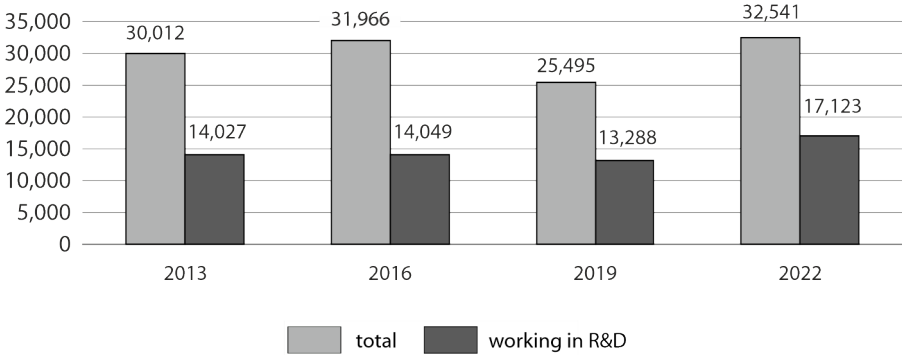


Source: author's work.

Figure 2 indicates an increase in the number of enterprises and organisations that produced innovative goods and works and provided services of their own in all areas of the manufacturing industry. Nevertheless, the experience of developed and developing countries shows that the effectiveness of innovative reforms is mainly reflected in the effectiveness of high-technology enterprises and organisations. In this regard, Uzbekistan recorded the lowest growth during the analysed period (eight units); therefore, the country's priority should be to increase the number of high-technology enterprises and organisations to the largest possible extent.

The overall number of research specialists increased by 2,529 people, reaching 32,541 in 2022, which was more than 1% of the total population of the country (Figure 3).

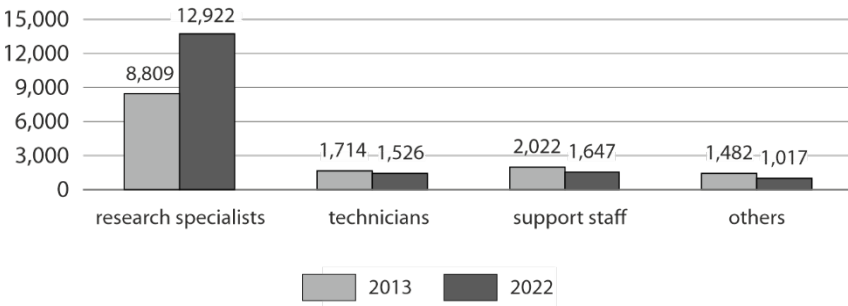
Figure 3. Number of research specialists (excluding part-time workers) in R&D compared to the total number of scientists



Source: author's work.

It is important to note that while the total number of research specialists increased by 2,529 people, the number of researchers in R&D grew by 3,096, which confirms that the share of research specialists in R&D in Uzbekistan increased. Thus, if in 2013 the share of R&D specialists in the total number of researchers was 46.7%, then in 2022 this figure rose to 52.6%. A change also occurred in favour of research specialists in R&D, whose number increased by 4,113 (Figure 4).

Figure 4. Number of people working in R&D, by specialisation



Source: author's work.

According to the indicators in Figure 4, a relative decrease is observed in the number of technicians (by 188 people), support staff (by 375 people) and other specialists (by 465 people) compared to the number of researchers.

5. Conclusions

An analysis of the effectiveness of the reforms carried out in Uzbekistan in the recent years in the field of science and innovation allows us to draw the conclusions below and consider the some important suggestions as to the further developments in this area. First of all, the formation and enhancement of innovative activities is based on the socio-economic and strategic development of the national economy of the country itself, as the construction of the innovation system is based primarily on strong and priority-oriented structures of the national economy. Moreover, reforms in the field of higher education, science and field of science and innovation development indicate the complexity and social orientation of the emerging innovation in the country. What is also important, is that a stable regulatory and legal innovation of Uzbekistan is being created, which forms the necessary elements and mechanisms for creating an effective innovative economy.

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The Fundamental Principles of Official Statistics as the basis for a social information environment in the globalised world

Fundamentalne zasady statystyki publicznej jako podstawa społecznego środowiska informacyjnego w zglobalizowanym świecie

1. The origins of the Fundamental Principles of Official Statistics

The Fundamental Principles of Official Statistics (FPOS) is a document often referred to as the *Statistical Decalogue*. It was developed in the years 1989–1991 under the auspices of the United Nations Economic Commission for Europe (UNECE) Conference of European Statisticians as a set of recommendations for governments and statistical offices of countries belonging to the UN European region. The direct and main purpose of this initiative was to create a document that would provide guidance and form the basis for statistical offices in post-communist countries. In 1989, in-depth political, social and economic transformations began in these states, which were transitioning to a democratic political model of state and establishing a market-driven economy. The countries of the European region which gained or regained political sovereignty after 1989 were in particular need of such official support. Building systems of official statistics harmonised with UN global statistical standards became a strategically important task for the transformations occurring in these countries to be effective.

The FPOS were first adopted in 1992 as a resolution of the UNECE. It soon became apparent that the principles presented in the *Statistical Decalogue* were of universal significance and that all countries and regions needed them amid the dynamically developing globalisation. The resolution proved to be a strategic guidepost for the development of official statistics not only in the countries of the UN European region that were transforming their political and economic systems, but also beyond. As a result, the FPOS were adopted by the UN Statistical Commission as early as in 1994, and 20 years later they gained the status of a UN General Assembly resolution.

Now, more than three decades following the initiative of the Conference of European Statisticians, the FPOS form the unquestionable *Statistical Decalogue* for all statisticians, statistical offices and other stakeholders of the systems of official statistics. For 30 years, the FPOS have provided the intellectual and legal basis for

strategies to modernise and develop the capacity of official statistics of all international organisations and all countries, especially those undergoing a deep and dynamic political and economic transformation combined with social and economic shocks.

The *Statistical Decalogue* has proven useful in countries which have gained or regained independence and political and institutional sovereignty. Micro- and small economies that have acquired political autonomy or sovereignty, as well as exclaves and enclaves form a large group of beneficiaries of the *Statistical Decalogue*. The FPOS are important for shaping the systems of official statistics in countries joining a variety of international structures such as customs unions, free trade zones or political-economic unions. The FPOS are also helpful in developing transborder official statistics whose basis is the deep regional-level harmonisation of the statistical systems of neighbouring countries.

2. Challenges of official statistics amid information, political, social and economic globalisation

The transformation of national and local systems of official statistics into a global infrastructural information system began in the 1920s under the League of Nations. In 1928, the International Convention on economic statistics was signed, along with a protocol containing detailed decisions regarding the economy and agricultural censuses. This was the first document somewhat initiating the harmonisation of official statistics on a global scale. The next important stage in the process was the establishment of the UN Statistical Commission in 1946, followed by the formation of the UN Statistical Office and the relevant offices for the UN regions.

Since the 1970s, the role and function of official statistics in political, social and economic processes has undergone further qualitative changes on a local, national, regional and global scale. These changes, their scope, pace and effects for official statistics and all of the stakeholders of statistical processes are determined primarily by the worldwide development and dissemination of modern information technologies. Widespread access to electronic mass media, particularly the Internet and global telecommunications networks, has made the world a global village, as Herbert M. McLuhan predictively, even prophetically, wrote in 1962.

Along with the globalisation of information processes, political, social and economic processes are also rapidly globalising. They are accompanied by a growing profound institutionalisation, which in practice means the coordination and sometimes direct management of these processes by international institutions (e.g. in the EU). International organisations and the international law are playing an increasingly important role in regulating political, economic and social processes in many regions of the world and on a global scale. The state under the rule of law is

becoming a commonly occurring political model, in which the political, social and economic life is regulated by legislated acts. This leads to extensive institutional interventionism of state authorities, international organisations or interest groups influencing the creation and application of law in all areas of political and economic life. It is currently difficult to indicate any areas of the economy and politics that are not governed by legal regulations, often highly detailed and comprehensive. In many countries, legal regulations also apply to numerous spheres of social activity or even to the private lives of citizens.

At present, official statistics is faced with new problems and challenges resulting from the globalisation and institutionalisation of political, social and economic processes as well as information processes, which are becoming more dynamic due to the spread of modern information and communication technologies (ICTs). The following are the most important:

1. The extensive institutionalisation and widespread regulation of political, social and economic processes through the introduction of laws creates the need for relevant, up-to-date, reliable and verified information, rendered in a language understandable unambiguously to all the potential users living in different countries, using different mother tongues and professional languages, in different usage situations. This phenomenon occurs among all international organisations, state authorities and administrations, social and economic entities and 'ordinary' citizens. In turn, all legal acts regulating economic, social and political processes require precise and quantified information. The language of statistical systems adhering to the FPOS fulfils these needs and requirements.
2. Until now, the systems of official statistics of particular states and international organisations coordinated by the UN Statistical Commission, the relevant regional statistical offices of the UN and other international organisations collaborating with the UN constitute the only information system of a global range that is currently able to perform (and indeed performs to the largest possible extent) the tasks of providing scientifically-based, quantified information on social, economic, political and ecological processes, and is able to develop a uniform language (of statistical metadata) for describing all these processes and phenomena.
3. Owing to the widespread modern information technologies and the lower costs of data collection and processing, more and more entities, including commercial ones, conduct statistical surveys commissioned by public institutions. Unfortunately, it is not uncommon for commercial surveys to fail to adhere to the scientific methodology required of official statistics by the UN and the relevant official statistical bodies of countries and international organisations. By publishing or otherwise using data that are the product of commercial research, these institutions create an illusion that the data are of the same quality, relevance

and usefulness as real official statistical data. As a result, the public information space offers both reliable official statistical data and information that meets the formal requirements of official data, but fails to fulfil the quality requirements, especially in terms of methodology and precision of measurement.

4. Numerous laws created by states and international organisations include components in which statistical data and metadata appear. Directives or administrative decisions also include such statistical components. One would expect these data and metadata to meet the standards and requirements of international or state official statistical institutions. These statistical components are in most cases edited not by professional statisticians, but by lawyers who do not always feel obliged to coordinate and harmonise them with official national or international statistical bodies. This phenomenon is sometimes referred to as the 'officialisation' of non-official statistical data or metadata. Data and metadata perceived as official and published in legal acts or other documents, for many users actually do become official statistical data.
5. As the institutional interventionism of state authorities and international institutions deepens, and considering the growing use of modern information technologies, government agencies and other institutions compile statistics on their own or outsource it to scientific units or commercial entities. A threat then arises to the quality of these data, especially in terms of the rigorous observance of official methodological and meta-information standards.
6. Due to the spread of modern ICTs among the public sector and business entities, information resources are created which can be used directly as sources. These resources are often referred to as *big data*. Access to these data by official statistics could enhance a number of statistical surveys, significantly reduce their costs, and, above all, create opportunities for low-cost and continuous statistical monitoring of important phenomena and processes not limited to periodic statistical surveys. However, official statistics still encounters, although increasingly rarely, legal barriers and restrictions or organisational limitations in obtaining access to such data.
7. A relatively small proportion of final users, even professional ones, seek publications and databases managed by institutions of official statistics to obtain statistical information. Most final users of statistical data do not directly turn to official publications and databases, but to more readily available secondary sources of information, mainly the Internet, mass media, different professional publications and even to sources of a propaganda, promotional or advertising nature. These sources include a combination of both official statistical data and metadata, and information of unknown origin or of a difficult to verify quality, exhibiting the formal character of official statistical data and metadata. End users may have

a problem with distinguishing real official statistics from 'officialised' data and metadata. They may be unaware that they are encountering unreliable information and information that does not meet the quality criteria set by authorised national or international statistical bodies. If faulty data are found together with real official data in one message, the label of poor statistical quality falls also on the existing side-by-side reliable information, undermining the trust in both official statistics and professional statisticians themselves.

The FPOS clearly define the rights and obligations of all stakeholders involved in official statistical processes. The observance of these rights and obligations makes it possible to avoid both old and new threats that are increasingly often polluting the public information space. These threats have emerged as a 'by-product' of the globalisation of the economy, commercialisation of information processes in the knowledge-based economy and ousting of democracy by 'demagocracy' in the modern ICT environment.

In this context, it seems necessary to construct specialised information environments that produce, store and deliver, as a public good, information adhering to the FPOS. This way the constantly progressing pollution of the public information space in a globalised world can be counteracted, at least in the scope of quantifiable phenomena and processes occurring in politics, the economy and among the society.

3. FPOS – ethical and legal preconditions of information quality

In the global knowledge-based economy and in democratic states under the rule of law, the condition for sustainable social and economic development and political collaboration is the existence of a 'clean' global information environment. It should contain only information that meets two basic quality criteria, i.e. the criterion of truth and the criterion of social utility.

Political, social and economic globalisation requires the harmonisation of information on a global scale, and universal access to relevant, reliable information as a public good. Amid the widespread modern global ICTs and the resulting emergence of rapidly growing commercialised information sectors, there are many social information environments which generate, capture, store and share information that often do not guarantee compliance with the quality criteria necessary for the end users.

In a globalised information society, particularly important roles are played by entities that act as intermediaries between information producers and users, i.e. they manage the systems involved in the sharing and dissemination of information on a local, regional or national scale, and more and more often also on an international and global scale. Dominant among these entities are the electronic mass media, the

Internet and institutions of mainstream education. It is these entities that determine the quality of social information environments. These environments form 'information cages' for most of the stakeholders of information processes. Many of them do not realise that they actually live in such cages and remain unaware of the information barriers their cages create for them. The observance of the FPOS by the organisations managing social information environments means that they should creatively adjust the stakeholders' information cages to their real needs. They should additionally protect their information environments from information that does not meet the quality criteria of truth and social utility.

Most end users obtain information produced by official statistics primarily through the above-mentioned intermediary entities. Under these circumstances, it is necessary for all stakeholders of statistical processes to adhere to common rules that determine the quality of statistical information and the functioning of official statistics systems.

In many countries, governments and other authorities as well as large corporations and organisations seek to create their own information environments in order to control all other information environments that may impact their activities and position. They are also interested in producing and disseminating selected statistical information, especially interpretations of official statistical data by controlling the mass media, including the Internet. Thanks to modern ICT, influencing the behaviour of even large populations of citizens, voters, buyers, employees, etc. through their information environments is very low-cost and the effects can be powerful and long-lasting. Therefore, it is not uncommon to observe the phenomenon of the deliberate polluting of social information environments with information, often in the form of statistical data and metadata, which do not meet the basic criteria of quality, i.e. the criterion of truth and the criterion of social utility.

In the so-called democratic states under the rule of law, the 'freedom of expression' and prohibition of censorship doctrine is established. 'Freedom of expression', understood as the right to freely pollute social information environments with fake news that fails to meet any quality criteria, in some countries leads to chaos, and in others to imposing self-censorship as more effective than institutionalised censorship.

In times of the globalisation of information, economic processes and deep institutional interventionism in states under the rule of law and international organisations, the information security of the country, society and economy depends on good laws. These laws should define the standards of information quality and develop a system guaranteeing the effective enforcement of these laws. The principles described in the legal act of the FPOS (as a resolution of the UN General Assembly) constitute such good and universal laws for the governance of political, social, economic and ecological information.

Narrow interest groups managing global information systems use modern ICTs and socio-technical methods to influence societies. In these circumstances, after several centuries of destruction and exploitation, it is necessary to apply towards social information environments approaches similar to those which were already developed and attempts were made towards their application. *Information ecology* seems to be a concept that captures well the essence of this approach. The FPOS form a good basis for a modern, pragmatic *information ecology* in the subjective and objective scope that modern statistics encompasses.

Information infrastructure is the basic layer of each country's social information environment. It provides verified, high-quality information as a due public good. It is the inherent duty of a state based on law (but only a state based on good law), to develop its information infrastructure. We must remember, as the eminent representative of Polish political thought of the 16th century, Rev. Piotr Skarga (1597/1936) said, a bad law is worse than the meanest tyrant, as the tyrant can either change, be persuaded or die, and his tyranny ceases. An evil law, on the other hand, always persists, always kills and does harm, both to the soul and to the body. It is like a lion, an ignorant beast which will not be persuaded until it is killed. The same applies to evil law: it does only harm to people, while it should benefit them. Thus, all established laws must be good or they are not laws.

If real democracy, social freedom and state sovereignty are to prevail, the pollution of the social information environments must be penalised. This penalisation should be adequate to the social, political and economic consequences caused by the pollution and it should concern all entities involved: the ones shaping this environment and the ones functioning within it. It should deter governments and interest groups that seek power over other states and nations. The FPOS should be the basis for formulating good laws penalising the pollution of social information environments with data and metadata that do not meet our civilisation's criteria for quality: the criterion of truth, the criterion of social utility and the criterion of minimal redundancy. With all the stakeholders adhering to the FPOS, official statistics would be able to and should play an important role in controlling the quality of data disseminated in social information environments by providing information that meets the above-mentioned quality criteria.

Last but not least, the prerequisite of sustainable development in the globalised world is the ability of governments, businesses and professionals to communicate effectively in languages that have common semantics and pragmatics. The UN and other international organisations have acknowledged some ethnic languages as international languages, but the globalised world needs global professional languages with, as mentioned above, common semantics and pragmatics, embedded in different ethnic languages. These requirements are met by the language of official statistics.

In politics, economy and scientific research, official statistics has become an international, precise tool of communication for all countries and nations. This internationalisation of the statistical language was achieved by adopting common, precisely defined metadata, common methods of observation and measurement of political, social, economic and many other phenomena, as well as by adhering to the rule of information quality check and the rules of the representation of empirical quantifiable information in ethnic languages. Not only does official statistics produce statistical indicators, but also – or rather first of all – it creates concepts and definitions, classifications, nomenclatures, terminologies and glossaries of indicators which are used directly to make important political, social and economic decisions.

The FPOS as the *Statistical Decalogue* form the foundation of the above-mentioned functions of official statistics. The language of official statistics can and should provide a common semiotic (especially lexical and semantic) basis for all ethnic languages used in international communication and in those fields of modern statistics where it is a research tool and a method of knowledge mapping.

The adoption of the FPOS by the UN General Assembly created legal and political conditions for official statistics to fulfil the function of an international language – the professional language for politics, economics and social and ecological phenomena and processes, the modern ‘lingua franca’, commonly used not only by professionals, but by the whole community of information society in our ‘global village’.

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Józef Oleński

Polskie Towarzystwo Statystyczne; Urząd Statystyczny w Rzeszowie, Polska / Polish Statistical Association; Statistical Office in Rzeszów, Poland. ORCID: <https://orcid.org/0000-0002-0887-2407>
E-mail: j.olenksi@stat.gov.pl

The evolution of Statistics Canada's stance on Fundamental Principles of Official Statistics: from peripheral to central

Fundamentalne zasady statystyki publicznej w praktyce Statistics Canada – od znaczenia marginalnego do kluczowego

1. Introduction

The importance of the activities undertaken by national statistical organizations may appear to be obvious to some, but it has not always been the case. Although data and official statistics have become prominent in decision making, it is not guaranteed that this will always be the case. Social and political contexts evolve and, for societies to protect themselves against negative drift, there must be a number of elements in place. An obvious set of such elements is made up of laws that govern society in one way or another. Legal codifications of philosophical and societal aspirations are needed for the foundation of a well functioning society. Further, as Oleński (2003) argues, freedom is based on truth, and the right to truth is fundamental. This implies a need for quality criteria and standards to protect this right to information for citizens. He pledges that: “official statistics seems to be the proper basis for that”.

When a number of eastern European countries transitioned away from a centrally managed economy, they required quality information to guide them into effective decision making and they needed to have a valid picture of their societies. It is precisely for this purpose that the Fundamental Principles of Official Statistics (FPOS) came to light at the initiative of the Conference of European Statisticians in the early 1990s (United Nations [UN], 2024). The FPOS were then approved globally by the United Nations Statistical Commission in 1994. Twenty years later, a crucial milestone was reached when the FPOS were endorsed by both the UN Economic and Social Council in 2013 and by the UN General Assembly in 2014 (UN Economic Commission for Europe [UNECE], 2015). This now meant that not only were the FPOS endorsed by statisticians, but also by politicians and their respective countries. Then, to help implementation, guidelines were produced by a UN Statistical Commission's Friends of the Chair committee in 2015 and revised in 2020 when a maturity model was developed to assess the implementation level of FPOS in countries (Milichich et al., 2021). The FPOS are guiding national statistical offices

(NSOs), but one could go even further and consider principles that should guide a country or state in how to deal with official statistics. Such principles are well described in Radermacher (2019), but the focus of this paper is about guiding NSOs.

The FPOS, which have been in place for over three decades, are now featuring prominently in Statistics Canada's governance and business activities. However, this is not how things started. When they were created over 30 years ago, the FPOS were not seen as being necessary for the Agency which had already established itself as a recognized organization with solid principles. Changes in context and a number of events have led to a more explicit adoption of the FPOS.

In this paper, we look at Statistics Canada's adoption of the FPOS, how some of them are already part of the new vision, and how some need more work. A brief history of the gradual adoption of the FPOS at Statistics Canada is provided, as are some of the implemented elements in support to each of the ten principles. The paper identifies principles for which the implementation could be strengthened and points out how these are integrated into the vision of the organization.

2. The FPOS and Statistics Canada

Since its early beginnings over 100 years ago, Statistics Canada has always sought to anchor its work on international standards and practice. The Bureau and now the Agency¹ has always been very active internationally, developing, sharing, adopting, and implementing principles to guide its work. Thanks to solid data, infrastructure, and methods developments, in particular from the mid 1980s to the early 1990s, Statistics Canada became a worldwide recognized national statistical organization of the highest quality ("Economics Brief – Good Statistics Guide", 1993; "Economist Good Statistics Guide Assesses Accuracy of Figures", 1991).

As the FPOS were developed and adopted, Statistics Canada's view about their adoption evolved significantly. The following is a characterization of the various steps of this evolution.

2.1. FPOS: Peripheral

In the early 1990s, the FPOS were essentially viewed as a framework to guide eastern European countries, and as such, they were not considered to be very useful for Statistics Canada. In fact, the view was that more generally for any country such basic truths should not have to be spelled out to be followed (Bodin, 2023). Further, the country had just become, according to *The Economist* ("Economics Brief – Good Statistics Guide", 1993; "Economist Good Statistics Guide Assesses Accuracy of

¹ From 1918 to 1970, the National Statistical Office in Canada was known as the Dominion Bureau of Statistics. Statistics Canada was established in 1971.

Figures”, 1991), the number one NSO in the world, so that it was felt at the time that the framework could be redundant to the principles already in place. Indeed, Statistics Canada already had elements that touched on each of the principles. Fellegi (1995) provided an account of these by describing the characteristics of an effective statistical system.

2.2. FPOS: Potentially useful

In 2010, the government of Canada decided to cancel the long form census. This led to the resignation of the Chief Statistician and created much debate about the independence of Statistics Canada. At the time, the previous Chief Statistician Ivan P. Fellegi (2011) said: “Well, I have maintained and recommended that the fundamental principles of official statistics that were adopted by the United Nations should be basically incorporated in the Statistics Act. That would make decisions of methodology independent of political interference”. This was a significant change from the position held almost 20 years earlier.

2.3. FPOS: Implicit

In 2012, the UNECE started working on the renewal of the FPOS with a view to bringing evidence that would convince their adoption at a higher level than the UN Statistical Commission. The Conference of European Statisticians gathered testimonies from countries. At that point, Statistics Canada had still not adopted the FPOS and felt that all its principles were now fully engrained into its work. The Agency provided this answer: “The Fundamental Principles represent values that are entrenched in our organisational culture. A great number of our staff do not have a conscious knowledge of the actual Principles, but despite this, their behaviour is fully consistent with them” (UN, 2012).

2.4. FPOS: Endorsed

In 2013, when the UN Economic and Social Council endorsed the FPOS and that it was pretty well known that the UN General Assembly was highly likely to do likewise, Statistics Canada immediately endorsed them and made this public by adding a note to this effect on its website. Further, the Agency prepared a video (Statistics Canada, 2014) showing how each of the principles were present in the work of the Agency. So, by 2014, FPOS were now officially part of Statistics Canada’s frameworks but only in a descriptive fashion.

2.5. FPOS: a Training Tool

By 2016, a few more people at Statistics Canada had become aware of the FPOS and they were starting to be increasingly mentioned. Then, as part of a technical assistance project which was concluding that year, Statistics Canada produced a compendium of management practices as training material. The compendium explicitly drew from the FPOS and had an entire chapter on them (Statistics Canada, 2016).

2.6. FPOS: a Guide Post

In the years that followed the adoption of the FPOS by the General Assembly, the UN Statistical Commission had a Friends of the Chair Group that looked at producing implementation guidelines. Statistics Canada did not participate in this group but provided extensive comments at each step. Then in 2022, on the 30th anniversary of the creation of the FPOS, 10 countries were asked to prepare a testimony video to showcase the importance of each of the principles. Canada quickly volunteered to produce the first one on Principle 1: Relevance, impartiality and equal access. The video (Statistics Canada, 2022) features a number of Canadian officials emphasizing the importance of data, statistics and the FPOS. At that point, as seen in the video, the FPOS had become a “Guide post” for statisticians.

2.7. FPOS: Central

In May 2024, the Chief Statistician announced that the FPOS would now be central to Statistics Canada's way forward. This shift in emphasis in the vision for Statistics Canada implies an increased focus on the core business of official statistics. That is, producing relevant and quality information, ensuring that it is sustainable through the use of new methods and standards that are efficient, and that strong related expertise is maintained and nurtured to achieve this. Thus, Statistics Canada has gone through the Carson (1998) two undertakings to foster the FPOS after adopting them, namely, publicizing them; and now providing an infrastructure to foster good decision-making.

3. Depth of the implementation of the FPOS

This section presents a few elements that show how each of the FPOS is implemented at Statistics Canada. It is not meant to be an exhaustive list of every activity related to the FPOS. For example, a more complete list of elements that existed in 2016 can be found in Statistics Canada (2016). Using the UN implementation guidelines similarly to Milichich et al. (2021), Statistics Canada's maturity in the implementation of each

principle is characterized² as developing, practicing, or leading. The criteria used are those which can be found in the UN guidelines (UN FOC-FPOS, 2020) and a summary table is provided in the Appendix. The objective is primarily descriptive and not meant to constitute a prescription on what to change or improve. As well, it is not a compliance assessment. Nonetheless, it should provide some insight on strengths and areas where improvements can be made to reach the next level of maturity.

3.1. Principle 1: Relevance, impartiality and equal access

Statistics Canada's mandate covers widely all social, economic, and environmental aspects of society. As part of its plan, Statistics Canada (2024b) provides a large variety of statistics. To ensure relevance, the Agency strives to constantly augment its output to respond to the various needs for data. The Agency mostly provides its information through its Daily website.³ In the last few years, the provision of relevant information significantly increased through the creation of a number of themed data hubs on topics such as poverty, quality of life, food prices, transportation, energy, internal and international trade, and infrastructure, to name a few. The poverty hub⁴ provides a good example of such a data offering.

To ensure relevance, Statistics Canada has a well-established network for consultation. The highest level of consultation is the Canadian Statistical Advisory Council which produces an annual report (Statistics Canada, 2023). The council is complemented by a series of subject matter advisory committees. The Agency also regularly conducts numerous federal-provincial-territorial consultations. It also maintains direct relations with other departments at all levels as well as with academia. For each domain, close partnerships are in place to develop the needed data programs. Statistics Canada provides equal access to its data to all Canadians with the systematic release of information on the Daily each morning at 8:30 a.m. Further, the publication schedule is made public well in advance of any release to ensure timing be and be seen as impartial.

Statistics Canada provides embargoed pre-release access to its products only to a specific and well controlled short list of users. All data released are free of charge, except for specifically requested analyses and custom tabulations. Analyses produced by Statistics Canada are non-partisan and present an objective view based on facts. The choice of data sources and methods is dictated by professional statistical considerations and changes in methodology are announced to users in advance of

² This characterization of the implementation is that of the author, it is not from an independent review and it is not necessarily Statistics Canada's official position.

³ <https://www150.statcan.gc.ca/n1/dai-quo/index-eng.htm>.

⁴ <https://www.statcan.gc.ca/en/topics-start/food-price>.

being implemented. Also, Statistics Canada has an internal directive on corrections to releases as well as a directive on media relations for correction of wrong uses.

In terms of human resources, the appointment and rules concerning the Chief Statistician are in part specified in the 1985 Statistics Act (revised in 2017). For the employees, Statistics Canada has clear and well-established procedures for hiring and promotion. As well, there are agency-level and government-level training available to all employees.

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.2. Principle 2: Professional standards and ethics

At Statistics Canada, all methods and approaches are subject to both internal and external scrutiny. Internally, new methods are presented before a scientific review committee and externally to the Advisory Committee on Statistical Methods. This committee is made of internationally renowned experts. Ethics is organized around a data ethics framework (Marcovitch & Rancourt, 2022). As part of this, there is an external council on ethics that oversees the potential impacts of new developments and advises the Agency. Internally, there is training provided to employees both on methods and on ethics. Further, there is an internal data ethics committee supported by a secretariat to provide guidance to all employees.

Statistical decisions are guided by a number of frameworks that have been developed and implemented at Statistics Canada. Methods are supported by quality guidelines (Statistics Canada, 2019) that have been updated to stay abreast of the evolution of methods and techniques. Decisions related to sensitive, ethical, and social issues in either of the Gather, Guard, Grow or Give steps of the data life cycle (Rancourt, 2019) are driven by the Necessity and Proportionality Framework (Statistics Canada, 2022). Further, a responsible Machine Learning framework has been developed to guide data science decisions related to the use of automated algorithms.

Statistics Canada is working closely with all its partners of the national statistical system to help and support them with data collection, methodologies, and analysis. Three main groups are achieving this: a special surveys unit in each of the economic and the social statistics fields, as well as a statistical consultation unit on the methodology side. Further, the Questionnaire Design Resources Centre is also providing assistance to programs and other departments that need their support.

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.3. Principle 3: Accountability and transparency

Processes to report quality and methods are clear. As it releases statistics and information, the Agency makes sure to inform users of quality or any change and follows a well-established policy on informing users of data quality and methodology (Statistics Canada, 2000). Information about data and metadata is also made available to users upon release, and in some cases, such as for the Census, even prior to releasing data. In the case of major programs (Census, Labour Force Survey), there are also user guides that are made available.

To go even further, Statistics Canada established a Trust Centre,⁵ which informs Canadians on the plans to collect information and use administrative and alternative data sources, on its Necessity and Proportionality framework (Statistics Canada, 2022) and on ethics.

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.4. Principle 4: Prevention of misuse

Statistics Canada has a Directive on Media relations which covers the monitoring and reporting of inaccuracies. When inaccuracies are detected, Statistics Canada often contacts the authors to provide explanations and request adjustments. Such comments and interventions are rarely public. Also, the interventions are for wrong numbers cited or errors. As far as interpretation that could be seen as misinformation or disinformation, the line has been somewhat blurred, and it is not always clear when/if to intervene. Occasionally, some training and support has been provided on the adequate use of Statistics Canada data, but this has not been systematically happening.

For this principle, the FPOS implementation maturity level is considered to be: Practicing.

3.5. Principle 5: Cost-effectiveness

Statistical programs have been using administrative and alternative data where appropriate for many decades. Since 2017, under Statistics Canada's modernization efforts (Arora, 2018), programs have augmented their efforts to use administrative data. This is described as the admin 1st paradigm in Rancourt (2018). To support programs, there is a centralized team managing administrative data acquisitions and they maintain strong relationships with data providers. Further, there is a strong data governance in place for all steps of the data life cycle of statistical programs.

⁵ <https://www.statcan.gc.ca/en/trust>.

When estimates are produced, Statistics Canada is guided by its Quality Guidelines (Statistics Canada, 2019), which are based on six dimensions of data quality. Part of these is coherence, an element of this principle. Further, harmonization across programs does take place as standard concepts and definitions are used across the Agency (Statistics Canada, 2024b).

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.6. Principle 6: Confidentiality

Confidentiality protection has always been a hallmark at Statistics Canada. The Statistics Act is clear on this, and it is complemented by a series of processes in place, from training to technical documents, approaches, and security measures. Upon being hired, all employees must take an oath of non-disclosure as specified in the Statistics Act and take confidentiality training. Further, all employees need an identity security card to enter the premises of the organization. When the card expires, employees must take again their confidentiality training to renew their card.

In terms of data access by researchers, it is necessary for all of them to submit their results and output to a strict set of verification procedures in order to vet their results and determine which part can be brought back with them. As for security, Statistics Canada has a complete system of data security both physical in terms of the organization's buildings, and digital in terms of all aspects of data access, monitoring, de-identification, encryption, and cloud infrastructure.

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.7. Principle 7: Legislation

Statistics Canada has a very well-established law. It has some degrees of detail, and it has a number of the FPOS within it (e.g. relevance, confidentiality), but not all of them. The Statistics Act is publicly available.

For this principle, the FPOS implementation maturity level is considered to be: Practicing.

3.8. Principle 8: National coordination

The national statistical system is dominated by Statistics Canada, given its mandate in the production of official statistics. However, Statistics Canada is not the sole producer of such statistics and coordination is complex since Canada is a federation of provinces and territories with sectoral authority found at different levels. Although

mechanisms are in place for coordination of the National Statistical System, more development is required to make it more effective. Further, the governance for coordination is shared with stakeholders and it is separately organized for a number of topics.

For this principle, the FPOS implementation maturity level is considered to be: Practicing.

3.9. Principle 9: International standards

Statistics Canada is a proactive user of international standards and methods. As new standards are developed, Canada is often among the early adopters. It is also an actor heavily involved in the development of international standards. Further, the use of standards is strongly promoted across the national statistical system. At the federal level, Statistics Canada is teaming up with the Standard Council of Canada to promote the use of standards and in parallel, Statistics Canada has been heavily involved in the development and implementation of the *2023–2026 Data strategy for the federal public service* (2023). A large part of the work in this strategy is to get standards adopted across all departments.

For this principle, the FPOS implementation maturity level is considered to be: Leading

3.10. Principle 10: International cooperation

Statistics Canada is a major player in the international statistical system. It is involved in almost 200 committees and workgroups, including those of the major organizations such as the UN Statistical Commission, the UNECE and the Organisation for Economic Co-operation and Development. Statistics Canada is both a user and a contributor of international statistical developments and standards. Further, Statistics Canada has been involved in multiple technical assistance programs with many countries over the years.

For this principle, the FPOS implementation maturity level is considered to be: Leading.

3.11. Summary

The following table summarizes the characterization of Statistics Canada's maturity in terms of the level of implementation of the FPOS.

Table. Characterization of Statistics Canada’s FPOS implementation maturity

Principle	Practicing	Leading
1. Relevance, impartiality and equal access		√
2. Professional standards and ethics		√
3. Accountability and transparency		√
4. Prevention of misuse.....	√	
5. Cost-effectiveness		√
6. Confidentiality		√
7. Legislation.....	√	
8. National coordination.....	√	
9. International standards		√
10. International cooperation		√

Note. The implementation of all FPOS exceeds the Developing maturity level. Developing maturity level, presented in Milichic et al. (2021).

Source: author’s work.

4. Making the FPOS central

As discussed in Section 2.7, the FPOS are now a point of emphasis in Statistics Canada’s strategic vision. The FPOS are general enough to provide a maneuvering margin that is broad enough to account for the Canadian data, statistical and societal reality and yet they are also precise enough to offer a solid anchoring point to decisions. Statistics Canada’s renewed vision (2024a) has three main dimensions that can each be linked to one or two of the FPOS. That is not to say that the other principles are not important, but rather that the emphasis of the work will be focused on these. They are, with the corresponding principle(s):

- placing the focus on core business for quality and relevance – Principle 1 (Relevance);
- ensuring program sustainability – Principle 5 (Cost-effectiveness) through new methods and standards for efficiency – Principle 9 (International standards);
- maintaining a strong expertise and ethics – Principle 2 (Professional standards and ethics).

These priorities correspond to FPOS principles that are already very strongly implemented at Statistics Canada. Each of these have a maturity level where Statistics Canada is leading. It could be argued that this is not where efforts need to be made, but on the contrary, they represent foundational areas that define national statistical organizations. Further, as society continues to evolve, NSOs cannot fall behind in those areas. In parallel, there are three principles where Statistics Canada’s implementation can be characterized as Practicing. They are:

- Principle 4: Prevention of misuse;
- Principle 7: Legislation;
- Principle 8: National coordination.

In order to lead for Principle 7, one would have to have all elements of the FPOS enshrined within the Act. This is not the case in Canada, and it would not be the sole purview of the NSO to change. On the other hand, looking at the other two principles, these areas can be considered for further improvement, and this is why Statistics Canada engaged its councils⁶ in related discussions to identify the way forward. As well, a small unit for coordination of the national statistical system has been created within Statistics Canada. These initiatives are all aiming to help Statistics Canada increase its implementation maturity level for these principles.

5. Conclusion

Statistics Canada's path to adopting the FPOS has been slow but steady. History has shown that the FPOS can be very useful and can provide the solid anchoring that is needed in difficult times. So, it is important to seize the occasion when the context is stable to increase the depth of FPOS adoption such that they be solidly in place when needed. Today, Statistics Canada has many more elements in place in support of each of the FPOS than it had for example 10 or 15 years ago when they could have served more efficiently. Countries should tap on the fact that the FPOS have not only been adopted by statisticians but also by the politics. A more explicit use of the FPOS should provide clarity to decisions and directions. Also, even with changes in context with developments and innovation, the FPOS provide an enduring central framework for official statistics.

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Appendix

Table A. Simplified maturity criteria

Principle	Developing	Practicing	Leading
1. Relevance, impartiality and equal access	<ul style="list-style-type: none"> • Consultation awareness • Limited data access • Limited downloads • No information on upcoming releases • Limited appointment rules for Chief Statistician • Pre-release • Limited free data • Not always free from politics • Choice of methods not always free • Changes not public • No error reporting • Recruitment and promotion not always objective • Limited training 	<ul style="list-style-type: none"> • Regular consultation • Some data access • Propriety formats • Pre-announced releases • Clear appointment rules for Chief Statistician • Pre-release to some groups • All free, exceptions • Objective production • Choice of methods free • Changes public, no notice • Error reporting • HR system in place • Training available 	<ul style="list-style-type: none"> • Partnership • Full data access • Open format • Pre-announced releases and changes • Clear appointment rules with specifics for Chief Statistician • Pre-release to some groups with controls • All free, pricing clear • Objective production and release • Choice of methods free and recognized • Changes public, notices • Revision policy • Professional open processes based on expertise • Training and development

Table A. Simplified maturity criteria (cont.)

Principle	Developing	Practicing	Leading
2. Professional standards and ethics	<ul style="list-style-type: none"> • Awareness of need for standard methods • Guidelines on ethics • Awareness of peer reviews • Awareness of standards 	<ul style="list-style-type: none"> • Use of standard methods mostly • Training on ethics • Peer reviews • Use of standards 	<ul style="list-style-type: none"> • Use of standard methods • Training on ethics and use assessment • Expert advices • Promotion of standards
3. Accountability and transparency	<ul style="list-style-type: none"> • Some quality notes provided • Limited quality reporting • Limited information on change 	<ul style="list-style-type: none"> • Framework for quality reporting • Quality information part of metadata • Information on major changes 	<ul style="list-style-type: none"> • Process for quality reporting is public • Quality reports always available • Always information on change
4. Prevention of misuse	<ul style="list-style-type: none"> • No intervention policy • Does not comment • Limited training 	<ul style="list-style-type: none"> • Intervention policy exists • Some comments • Some training 	<ul style="list-style-type: none"> • Policy exists, interventions made • Regular comments • Training
5. Cost-effectiveness	<ul style="list-style-type: none"> • Limited data sources • Limited or no liaison • Coherence not addressed • No oversight 	<ul style="list-style-type: none"> • Admin data used • Relationships • Some coherence coordination • Harmonization important 	<ul style="list-style-type: none"> • Admin data used and governance in place • Pro-actively seeking opportunities • Coherence a priority • Harmonization in place
6. Confidentiality	<ul style="list-style-type: none"> • Policy • Policy provided to staff • Some access conditions • Security provisions 	<ul style="list-style-type: none"> • Policy and guidelines • Signed commitment • Established procedures • Security provision based on standards 	<ul style="list-style-type: none"> • Comprehensive system • Signed commitment and training • Strict conditions and monitoring • Sophisticated modern security in place
7. Legislation	<ul style="list-style-type: none"> • General law • Hard to find 	<ul style="list-style-type: none"> • Law with some FPOS • Publicly available 	<ul style="list-style-type: none"> • Law with all FPOS • Publicly available
8. National coordination	<ul style="list-style-type: none"> • Awareness • Split governance 	<ul style="list-style-type: none"> • Some coordination • Limited central governance 	<ul style="list-style-type: none"> • Across system • NSO is recognized leading body
9. International standards	<ul style="list-style-type: none"> • Main concepts used • Should be promoted 	<ul style="list-style-type: none"> • Concepts used, some new versions in place • Promoted 	<ul style="list-style-type: none"> • Concepts used, some new versions in place • Promoted, contributed to development
10. International cooperation	<ul style="list-style-type: none"> • Some participation 	<ul style="list-style-type: none"> • Active participation 	<ul style="list-style-type: none"> • Continuous contribution

Eric RancourtStatistics Canada, Canada. ORCID: <https://orcid.org/0000-0002-1703-6320>E-mail: eric.rancourt@statcan.gc.ca

WYDAWNICTWA GUS. MAJ 2024 PUBLICATIONS OF STATISTICS POLAND. MAY 2024

W ofercie wydawniczej Głównego Urzędu Statystycznego z ubiegłego miesiąca warto zwrócić uwagę na następującą publikację:

Among Statistics Poland's publications from the previous month, we would like to recommend:

20 lat razem. Polska w Unii Europejskiej **20 years together. Poland in the European Union**

Publikacja wydana z okazji 20. rocznicy akcesji Polski do Unii Europejskiej.



Język: polski

Language: Polish

Seria: Foldery i publikacje okolicznościowe

Series: Brochures and celebratory publications

Dostępne wersje: drukowana i elektroniczna

Available in: printed and electronic form

Polska – wraz z Cyprem, Czechami, Estonią, Litwą, Łotwą, Malta, ze Słowacją, Słowenią i z Węgrami – przystąpiła do UE 1 maja 2004 r. To ważne wydarzenie wiązało się m.in. z otwarciem granic, rozszerzeniem wspólnego rynku i udzielaniem wsparcia z funduszy europejskich oraz otworzyło nowe perspektywy dla polskich obywateli, przedsiębiorców i instytucji.

W opracowaniu zawarto podstawowe informacje o UE, ze szczególnym uwzględnieniem statystyki europejskiej, a także opisano wybrane zmiany społeczne, gospodarcze i środowiskowe, które zaszły w Polsce w okresie członkostwa we Wspólnocie. Zamieszczono również rankingi statystyczne przedstawiające pozycję Polski na tle innych krajów członkowskich (np. pod względem obciążenia demograficznego, bezrobocia i emisji gazów cieplarnianych).

W maju br. ukazały się ponadto:

- „Biuletyn statystyczny” nr 4/2024;
- *Ceny robót budowlano-montażowych i obiektów budowlanych (marzec 2024 r.);*
- *Koniunktura w przetwórstwie przemysłowym, budownictwie, handlu i usługach 2000–2024 (maj 2024). Z pogłębioną analizą aktualnych zagadnień gospodarczych;*
- *Polska w liczbach 2024;*
- *Produkcja ważniejszych wyrobów przemysłowych w kwietniu 2024 r.;*
- *Skup i ceny produktów rolnych w 2023 r.;*

- *Sytuacja społeczno-gospodarcza kraju w kwietniu 2024 r.*;
- „Wiadomości Statystyczne. The Polish Statistician” nr 5/2024;
- *Wyniki finansowe przedsiębiorstw niefinansowych 01–12 2023 r.*

Joanna Sadowy

Główny Urząd Statystyczny, Departament Opracowań Statystycznych, Polska
Statistics Poland, Statistical Products Department, Poland

Wszystkie publikacje GUS w wersji elektronicznej są dostępne na stronie stat.gov.pl/publikacje/publikacje-a-z. Wersje drukowane (jeśli zostały wydane) można zamawiać pod adresem: zws-sprzedaz@stat.gov.pl.

All the publications of Statistics Poland available in electronic form can be accessed at stat.gov.pl/en/publications. Printed versions (if available) may be ordered at: zws-sprzedaz@stat.gov.pl.

DLA AUTORÓW FOR THE AUTHORS

(for the English translation of the information given below, please visit ws.stat.gov.pl/ForAuthors)

W „Wiadomościach Statystycznych. The Polish Statistician” („WS”) zamieszczane są artykuły o charakterze naukowym poświęcone teorii i praktyce statystycznej, które prezentują wyniki oryginalnych badań teoretycznych lub analitycznych wykorzystujących metody statystyki matematycznej, opisowej bądź ekonometrii. Ukazują się również artykuły przeglądowe, recenzje publikacji naukowych oraz inne opracowania informacyjne. W czasopiśmie publikowane są prace w języku polskim i angielskim.

Od 2007 r. „WS” znajdują się na liście czasopism naukowych MEiN. Zgodnie z komunikatem Ministra Edukacji i Nauki z dnia 1 grudnia 2021 r. w sprawie wykazu czasopism naukowych i recenzowanych materiałów z konferencji międzynarodowych „WS” otrzymały 70 punktów.

„Wiadomości Statystyczne. The Polish Statistician” są udostępniane w następujących bazach, repozytoriach, katalogach i wyszukiwarkach: Agro, BazEkon, Biblioteka Nauki, Central and Eastern European Academic Source (CEEAS), Central and Eastern European Online Library (CEEOL), Central European Journal of Social Sciences and Humanities (CEJSH), Directory of Open Access Journals (DOAJ), EBSCO Discovery Service, European Reference Index for the Humanities and Social Sciences (ERIH Plus), Exlibris Primo, Google Scholar, ICI Journals Master List, ICI World of Journals, Norwegian Register for Scientific Journals and Publishers (The Nordic List) oraz Summon.

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3. **Ocena Kolegium Redakcyjnego (KR)**, decydująca o przyjęciu pracy do publikacji. Jest dokonywana na podstawie recenzji, z uwzględnieniem opinii redaktorów tematycznego i merytorycznego. Polega m.in. na weryfikacji dokonania przez autora zmian w artykule stosownie do uwag recenzentów. KR ocenia artykuł pod względem poprawności i spójności merytorycznej oraz zaleca autorowi wprowadzenie poprawek, jeśli są one konieczne, aby praca spełniała wymogi czasopisma. Autorowi przysługuje prawo do odwołania od decyzji o niepublikowaniu artykułu. W takim przypadku powinien on skontaktować się z redakcją „WS” i przedstawić uzasadnienie. Ostateczna decyzja w tej sprawie należy do redaktora naczelnego.

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3.2. Odpowiedzialność Rady Naukowej, Kolegium Redakcyjnego i Wydziału Czasopism Naukowych w Departamencie Opracowań Statystycznych GUS

1. Rada Naukowa (RN) kształtuje profil programowy czasopisma, określa kierunki jego rozwoju i konsultuje jego zakres merytoryczny.
2. Kolegium Redakcyjne (KR) podejmuje decyzję o publikacji danego artykułu z uwzględnieniem ocen recenzentów oraz opinii zespołu redakcyjnego. W swoich rozstrzygnięciach członkowie KR kierują się kryteriami merytorycznej oceny wartości artykułu, jego oryginalności i jasności przekazu, a także ścisłego związku z celem i zakresem tematycznym „WS”. Oceniają artykuły niezależnie od płci, rasy, pochodzenia etnicznego, narodowości, religii, wyznania, światopoglądu, niepełnosprawności, wieku lub orientacji seksualnej ich autorów.
3. Zespół redakcyjny, wyodrębniony z KR, tworzą redaktor naczelny i jego zastępca, redaktorzy tematyczni i redaktor merytoryczny. Członkowie zespołu redakcyjnego weryfikują nadsyłane artykuły pod względem merytorycznym, oceniają ich zgodność z celem i zakresem tematycznym „WS” oraz sprawdzają spełnienie wymogów redakcyjnych i przestrzeganie zasad rzetelności naukowej. Ponadto wybierają recenzentów w taki sposób, aby nie wystąpił konflikt interesów, i dbają o zapewnienie uczciwego, bezstronnego i terminowego procesu recenzowania.
4. Za sprawny przebieg procesu wydawniczego, poinformowanie wszystkich jego uczestników o konieczności przestrzegania obowiązujących zasad i przygotowanie artykułów do publikacji odpowiadają pracownicy Wydziału Czasopism Naukowych (WCN) w Departamencie Opracowań Statystycznych GUS. W celu uzyskania obiektywnej oceny oryginalności nadsyłanych artykułów przed skierowaniem ich do recenzji WCN wykorzystuje system

antyplagiatowy. Informacje dotyczące artykułu mogą być przekazywane przez WCN wyłącznie autorom, recenzentom, członkom RN i KR oraz wydawcy.

5. Zmiany dokonane w tekście na etapie przygotowania artykułu do publikacji nie mogą naruszać zasadniczej myśli autorów. Wszelkie modyfikacje o charakterze merytorycznym są z nimi konsultowane.
6. W przypadku podjęcia decyzji o niepublikowaniu artykułu nie może on zostać w żaden sposób wykorzystany przez wydawcę lub uczestników procesu wydawniczego bez pisemnej zgody autorów. Autorzy mogą się odwołać od decyzji o niepublikowaniu artykułu. W tym celu powinni się skontaktować z redaktorem naczelnym lub sekretarzem redakcji „WS” i przedstawić stosowną argumentację. Odwołania autorów są rozpatrywane przez redaktora naczelnego.
7. Członkowie RN i KR ani pracownicy WCN nie mogą pozostawać w jakimkolwiek konflikcie interesów w odniesieniu do artykułów zgłaszanych do publikacji. Przez konflikt interesów należy rozumieć sytuację, w której jakiegokolwiek interesy lub zależności (służbowe, finansowe lub inne) mogą mieć wpływ na ocenę artykułu lub decyzję o jego publikacji.
8. W celu przeciwdziałania nierzetelności naukowej wymagane jest złożenie przez autorów oświadczenia, w którym deklarują, że zgłaszany artykuł nie narusza praw autorskich osób trzecich, nie był dotychczas publikowany i jest ich oryginalnym dziełem, a także określają swój wkład w opracowanie artykułu.
9. W celu zapewnienia wysokiej jakości recenzji wymagane jest złożenie przez recenzentów oświadczenia o przestrzeganiu zasad etyki recenzowania COPE i niewystępowaniu konfliktu interesów.
10. W przypadku uzasadnionego podejrzenia na jakimkolwiek etapie procesu wydawniczego, że autorzy dopuścili się nierzetelności naukowej (zob. pkt 3.1. Odpowiedzialność autorów), zespół redakcyjny skrupulatnie zbada sprawę ewentualnego nadużycia. Jeśli nierzetelność autorów zostanie udowodniona, to zgłoszony przez nich artykuł zostanie odrzucony przez KR, a autorzy otrzymają informację o podjętej decyzji wraz z jej uzasadnieniem.
11. Czytelnicy, którzy mają wobec autorów opublikowanego artykułu uzasadnione podejrzenia o nierzetelność naukową, powinni powiadomić o tym redaktora naczelnego lub sekretarza redakcji. Po zbadaniu sprawy ewentualnego nadużycia czytelnicy zostaną poinformowani o rezultacie przeprowadzonego postępowania. W przypadku potwierdzenia nadużycia, na łamach czasopisma zostanie zamieszczona stosowna informacja.

3.3. Odpowiedzialność recenzentów

1. Recenzenci przyjmują artykuł do recenzji tylko wtedy, gdy uznają, że:
 - posiadają odpowiednią wiedzę w określonej dziedzinie, aby rzetelnie ocenić pracę;
 - zgodnie z ich stanem wiedzy nie istnieje konflikt interesów w odniesieniu do autorów, przedstawionych w artykule badań i instytucji je finansujących, co potwierdzają w oświadczeniu;
 - mogą wywiązać się z terminu ustalonego przez redakcję, aby nie opóźnić publikacji.
2. Recenzenci są zobligowani do zachowania obiektywności i poufności oraz powstrzymania się od osobistej krytyki. Zawsze powinni uzasadnić swoją ocenę, przedstawiając stosowną argumentację.

3. Recenzenci powinni wskazać ważne dla wyników badań opublikowane prace, które w ich ocenie powinny zostać przywołane w ocenianym artykule.
4. W razie stwierdzenia wysokiego poziomu zbieżności treści recenzowanej pracy z innymi opublikowanymi materiałami lub podejrzenia innych przejawów nierzetelności naukowej recenzenci są zobowiązani poinformować o tym redakcję.
5. Po ukończeniu recenzji przechowywanie przesłanych przez redakcję materiałów (w jakiegokolwiek formie) oraz posługiwanie się nimi przez recenzentów jest niedozwolone.

3.4. Odpowiedzialność wydawcy

1. Materiały opublikowane w „WS” są chronione prawem autorskim.
2. Wydawca udostępnia pełną treść wszystkich artykułów w internecie w trybie otwartego dostępu, tj. bezpłatnie i bez technicznych ograniczeń, od 1 stycznia 2022 r. na licencji Creative Commons Uznanie autorstwa – Na tych samych warunkach 4.0 (CC BY-SA 4.0). W przypadku artykułów zgłoszonych do „WS” od 2022 r. dozwolone jest dzielenie się artykułem (kopiowanie i rozpowszechnianie go w dowolnym medium i formacie) oraz adaptowanie go (w dowolnym celu, także komercyjnym) na warunkach określonych w tej licencji. Z pozostałych artykułów zamieszczonych w czasopiśmie można korzystać w ramach otwartego dostępu, zgodnie z ustawą o otwartych danych i ponownym wykorzystywaniu informacji sektora publicznego.
3. Wydawca deklaruje gotowość do opublikowania poprawek, wyjaśnień i przeprosin.

4. Wymogi redakcyjne

Zgodnie z wymogami czasopisma omawiany w artykule problem badawczy powinien być jednoznacznie zdefiniowany oraz istotny dla oceny zjawisk społecznych lub gospodarczych. Artykuł powinien zawierać wyraźnie określony cel badania, precyzyjny opis badanych zjawisk i stosowanych metod, uzyskane wyniki przeprowadzonej analizy oraz autorskie wnioski.

4.1. Struktura i zawartość artykułu

Wymagane elementy artykułu:

1. Tytuł.
2. Dane autora: imię/imiona i nazwisko, afiliacja w języku polskim i angielskim, ORCID, wkład w powstanie artykułu, adres e-mail. Wśród autorów artykułu wieloautorskiego należy wskazać autora korespondencyjnego.
3. Streszczenie (zalecana objętość – do 1200 znaków ze spacjami, forma bezosobowa). W przypadku artykułu opisującego badanie empiryczne powinno zawierać: cel, przedmiot, okres i metodę badania, źródła danych i najważniejsze wnioski z badania. W przypadku artykułów o innym charakterze należy podać co najmniej cel pracy, jej przedmiot i najważniejsze wnioski.

Streszczenie to podstawowe źródło informacji o artykule, warunkujące też decyzję czytelnika o zapoznaniu się z całą pracą. Dlatego powinno być przygotowane ze szczególną starannością i dbałością o umieszczenie w nim wszystkich wymaganych elementów.

4. Słowa kluczowe – najistotniejsze pojęcia lub wyrażenia użyte w pracy (nie mniej niż trzy). Powinny być zawarte w streszczeniu i/lub tytule.
 5. Kod/kody z klasyfikacji Journal of Economic Literature (JEL).
 6. Tłumaczenie tytułu, streszczenia i słów kluczowych (na język angielski w przypadku artykułu napisanego w języku polskim, a na język polski w przypadku artykułu napisanego w języku angielskim).
 7. W artykule opisującym badanie empiryczne wymagane są następujące części:
 - wprowadzenie, zawierające syntetyczne przedstawienie zagadnień teoretycznych, uzasadnienie podjęcia danego problemu badawczego, cel badania i krytyczne odniesienie do literatury przedmiotu. W wyjątkowych przypadkach, kiedy istotne dla podjętego tematu jest obszerniejsze przedstawienie dyskusji toczącej się w literaturze, przegląd literatury może stanowić odrębną część artykułu;
 - metoda badania, uwzględniająca przedmiot i okres badania, źródła danych i zastosowane metody badawcze, w tym uzasadnienie ich wyboru;
 - wyniki badania – analiza danych oraz interpretacja wyników i odniesienie ich do rezultatów wcześniejszych badań (dyskusja). W uzasadnionych przypadkach dyskusja może stanowić odrębną część artykułu;
 - podsumowanie, które powinno być zwarte i odzwierciedlać istotę problemu badawczego przedstawionego w artykule, bez podawania danych liczbowych; końcowe wnioski powinny odnosić się do treści artykułu, a w szczególności do celu badania.
- Wszystkie części powinny być opatrzone numerami.
8. Bibliografia, zawierająca pełny wykaz prac i materiałów przywołanych w artykule, przygotowana zgodnie z wymogami czasopisma.

4.2. Przygotowanie artykułu

1. Artykuł powinien być utrzymany w formie bezosobowej.
2. Tekst należy zapisać alfabetem łańciskim. Nazwy własne, tytuły itp. oryginalnie zapisane innym alfabetem powinny być poddane transliteracji.
3. Nie należy stosować stylów; formatowanie należy ograniczyć do wymogów redakcyjnych.
4. Objętość artykułu łącznie ze streszczeniem, słowami kluczowymi, bibliografią, tablicami, wykresami i innymi materiałami graficznymi nie powinna być mniejsza niż 10 stron maszynopisu ani przekraczać 20 stron.
5. Edytor tekstu: Microsoft Word, format *.doc lub *.docx.
6. Krój czcionki:
 - Arial – tytuł, autor, streszczenie, słowa kluczowe, kody JEL, śródtytuły, elementy graficzne (tablice, zestawienia, wykresy, schematy), przypisy;
 - Times New Roman – tekst główny, bibliografia.
7. Wielkość czcionki:
 - 14 pkt – tytuł, autor, śródtytuły wyższego rzędu;
 - 12 pkt – tekst główny, śródtytuły niższego rzędu;
 - 10 pkt – pozostałe elementy.
8. Marginesy – 2,5 cm z każdej strony.

9. Interlinia – 1,5 wiersza; tablice i przypisy – 1 wiersz; przed tytułami rozdziałów i podrozdziałów oraz po nich – pusty wiersz.
10. Wcięcie akapitowe – 0,4 cm; bibliografia – bez wcięcia, wysunięcie 0,4 cm.
11. Przy wycienieniach należy posłużyć się listą punktowaną z punktarami w postaci kropek (wysunięcie 0,4 cm, wcięcie 0 cm); wiersze (oprócz ostatniego) zakończone średnikiem.
12. Strony ponumerowane automatycznie.
13. Tablice i elementy graficzne (wykresy, mapy, schematy) muszą być przywołane w tekście.
14. Wykresy, mapy i schematy należy zamieścić w tekście głównym. Wykresy powinny być edytowalne (optymalnie wykonane w programie Excel; w przypadku wykonania w programie graficznym powinny mieć postać wektorową). Wykresy i inne materiały graficzne należy przekazać osobno, najlepiej w pliku programu Excel lub innym edytowalnym w pakiecie Microsoft Office.
15. Tablice muszą być edytowalne. Nie należy stosować rastrów, cieniowania, pogrubiania czy też podwójnych linii itp.
16. Wskazówki dotyczące opracowywania map znajdują się w publikacji *Mapy statystyczne. Opracowanie i prezentacja danych*, dostępnej na stronie internetowej GUS.
17. Pod tablicami i każdym elementem graficznym należy podać źródło opracowania, a także objaśnić użyte w nich skróty i symbole.
18. Literowe symbole liczb i innych wielkości niezłożonych należy zapisywać małą lub dużą literą i pismem pochyłym (np. a , A , $y(x)$, a_i); wektorów – pismem pochyłym i pogrubionym (np. \mathbf{a} , \mathbf{A} , \mathbf{w} , $\mathbf{y}(x)$, \mathbf{w}_i); macierzy – pismem prostym i pogrubionym (np. \mathbf{A} , \mathbf{a} , \mathbf{M} , $\mathbf{Y}(x)$, \mathbf{M}_i).
19. Objasnienia znaków umownych i zapisów w tablicach: kreska (–) – zjawisko nie wystąpiło; zero (0) – zjawisko istniało w wielkości mniejszej od 0,5; (0,0) – zjawisko istniało w wielkości mniejszej od 0,05; kropka (.) – brak informacji, konieczność zachowania tajemnicy statystycznej, wypełnienie pozycji jest niemożliwe lub niecelowe; „w tym” – oznacza, że nie podaje się wszystkich składników sumy.
20. Stosowane są następujące skróty: tablica – tabl., wykres – wykr.
21. Wszystkie zawarte w artykule informacje, dane i stwierdzenia wykraczające poza wiedzę powszechną – np. wyniki badań innych autorów, zarówno o charakterze empirycznym, jak i koncepcyjnym – muszą być opatrzone przypisem bibliograficznym. Przez wiedzę powszechną należy rozumieć informacje ogólnie znane i niebudzące wątpliwości ani kontrowersji w danej grupie społecznej, np. utworzenie GUS w 1918 r. lub powstanie UE w 1993 r. na podstawie traktatu z Maastricht. Natomiast dane statystyczne udostępniane lub publikowane np. przez GUS lub Eurostat nie należą do takich informacji. Charakteru wiedzy powszechnej nie mają również stwierdzenia odnoszące się do idei, zjawisk i procesów społecznych, politycznych czy gospodarczych. Nawet pozornie zdroworozsądkowe idee zmieniają bowiem swój sens w zależności od kultury, języka lub dyscypliny naukowej, a także bywają w rozmaity sposób konceptualizowane, jak np. pojęcie poznania w naukach społecznych.

Podanie źródła jest konieczne niezależnie od tego, czy informacje lub stwierdzenia są ujęte w ramy cytatu, czy przedstawione bez dosłownego przytoczenia, np. w formie parafrazy. Jeżeli stwierdzenie może budzić jakiegokolwiek wątpliwości odbiorców, autor powinien wskazać stosowne źródło podawanej informacji.

22. Przypisy rzeczowe, słownikowe lub informacyjne należy umieszczać na dole strony. Przypisy bibliograficzne, zgodnie ze standardem APA (American Psychological Association), należy podawać w tekście głównym.
23. Bibliografię należy przygotować zgodnie ze standardem APA.

4.3. Przywoływanie źródeł w artykułach napisanych w języku polskim

4.3.1. Ogólne zasady APA

Wyszczególnienie	Przykład przywołania	
	w odsyłaczu	w treści zdania
Autor indywidualny		
Jeden autor	(Iksiński, 2001)	Iksiński (2001)
Dwóch autorów	(Iksiński i Nowak, 1999)	Iksiński i Nowak (1999)
Trzech autorów lub więcej	(Jankiewicz i in., 2003)	Jankiewicz i in. (2003)
Autor instytucjonalny		
Nazwa funkcjonuje jako powszechnie znany skrótowiec: pierwsze przywołanie w tekście	(International Labour Organization [ILO], 2020)	International Labour Organization (ILO, 2020)
kolejne przywołanie	(ILO, 2020)	ILO (2020)
Pełna nazwa	(Stanford University, 1995)	Stanford University (1995)
Przypadek niepełnych danych bibliograficznych		
Brak ustalonego autorstwa	(<i>Skrócony tytuł ...</i> , 2015)	<i>Pełny tytuł</i> (2015)
Brak roku wydania	(Iksiński, b.r.)	Iksiński (b.r.)
Inne przypadki		
Przywoływanie kilku prac (porządek prac – chronologiczny, porządek autorów – alfabetyczny)	(Iksiński, 1997, 1999, 2004a, 2004b; Nowak, 2002)	Iksiński (1997, 1999, 2004a, 2004b) i Nowak (2002)
Przywoływanie publikacji za innym autorem (uwaga: w bibliografii należy wymienić tylko pracę czytaną)	(Nowakowski, 1990, za: Zieniecka, 2007)	Nowakowski (1990, za: Zieniecka, 2007)

Źródło: opracowanie na podstawie: American Psychological Association. (2020). *Publication manual of the American Psychological Association* (wyd. 7). <https://doi.org/10.1037/0000165-000>.

4.3.2. Szczegółowe wewnętrzne zasady „WS”

4.3.2.1. Adresy portali internetowych, w tym baz danych Głównego Urzędu Statystycznego

Adresy portali internetowych, które są przywoływane w artykule jedynie w celach informacyjnych, należy umieszczać w przypisach dolnych.

W przypadku korzystania z danych pobranych z baz Głównego Urzędu Statystycznego prosimy o podanie w miejscu, w którym baza jest przywoływana po raz pierwszy, pełnej nazwy bazy i jej skrótu (jeśli istnieje), nazwy jej właściciela oraz adresu internetowego w przypisie dolnym. W kolejnych przywołaniach, np. w źródle pod wykresem, należy posługiwać się już tylko pełną lub skróconą nazwą bazy.

Przykłady baz danych GUS	
pierwsze przywołanie	kolejne przywołania
Bank Danych Lokalnych (BDL) Głównego Urzędu Statystycznego + link podany w przypisie dolnym: https://bdl.stat.gov.pl	BDL
Baza Demografia Głównego Urzędu Statystycznego + link podany w przypisie dolnym: https://demografia.stat.gov.pl	Baza Demografia
Dziedzinowe Bazy Wiedzy (DBW) Głównego Urzędu Statystycznego + link podany w przypisie dolnym: https://dbw.stat.gov.pl	DBW

4.3.2.2. Akty prawne

Jeśli autor powołuje się w pracy na akty prawne, powinien za pierwszym razem podać ich pełny oficjalny tytuł; przy kolejnych przywołaniach najczęściej wystarczy nazwa skrócona. W przypadku aktów prawnych zapisanych w innym alfabecie niż łaciński tytuł trzeba poddać transkrypcji. (Informacje dotyczące miejsca publikacji aktu prawnego, takie jak numer dziennika urzędowego, należy podać tylko w opisie zamieszczonym w bibliografii załącznikowej).

Przykłady aktów prawnych	
pierwsze przywołanie	kolejne przywołania
Ustawa z dnia 29 czerwca 1995 r. o statystyce publicznej (dalej: ustawa o statystyce publicznej)	ustawa o statystyce publicznej
Rozporządzenie Parlamentu Europejskiego i Rady (UE) nr 1260/2013 z dnia 20 listopada 2013 r. w sprawie statystyk europejskich w dziedzinie demografii (dalej: rozporządzenie w sprawie statystyk europejskich)	Rozporządzenie w sprawie statystyk europejskich
Statistics Act	Statistics Act

4.4. Bibliografia załącznikowa w artykułach napisanych w języku polskim

4.4.1. Zasady ogólne

Bibliografia powinna być zamieszczona na końcu opracowania.

Źródła należy uszeregować alfabetycznie według nazwiska pierwszego autora, a w przypadku dwóch lub więcej prac tego samego autora – chronologicznie według roku publikacji. Prace bez znanego roku publikacji (oznaczone „b.r.”) występują przed pracami ze znanym rokiem publikacji. Jeśli kilka prac tego samego autora zostało opublikowanych w tym samym roku, należy podać je w kolejności alfabetycznej według tytułu i odpowiednio oznaczyć literami a, b, c itd.

Opis bibliograficzny materiałów dostępnych w internecie powinien zawierać link prowadzący do źródłowej strony internetowej lub link DOI. Nie należy podawać linków prowadzących do baz czasopism czy repozytoriów.

4.4.2. Przykłady opisów bibliograficznych

Typ źródła	Przykład opisu bibliograficznego
Artykuł w czasopiśmie	
W wersji: drukowanej	Nazwisko, X. (rok). Tytuł artykułu. <i>Tytuł czasopisma, rocznik (zeszyt)</i> , strona początku–strona końca.
elektronicznej, z DOI	Nazwisko, X., Nazwisko 2, Y. (rok). Tytuł artykułu. <i>Tytuł czasopisma, rocznik(zeszyt)</i> , strona początku–strona końca. https://doi.org/xxx .
elektronicznej, bez DOI	Nazwisko, X., Nazwisko 2, Y., Nazwisko 3, Z. (rok). Tytuł artykułu. <i>Tytuł czasopisma, rocznik(zeszyt)</i> , strona początku–strona końca. https://xxx .
Opublikowany w trybie online first	Nazwisko, X. (rok). Tytuł artykułu. <i>Tytuł czasopisma</i> . Opublikowany w trybie online first. https://xxx .
Artykuł w gazecie codziennej	
W wersji: drukowanej	Nazwisko, X. (rok, miesiąc i dzień). Tytuł artykułu. <i>Tytuł czasopisma</i> , strona lub strona początku–strona końca.
elektronicznej	Nazwisko, X. (rok, miesiąc i dzień). Tytuł artykułu. <i>Tytuł czasopisma</i> . https://xxx . Nazwisko, X. (b.r.). Tytuł artykułu. <i>Tytuł czasopisma</i> . https://xxx . Tytuł artykułu. (rok, miesiąc i dzień). <i>Tytuł czasopisma</i> . https://xxx .
Książka	
W wersji: drukowanej	Nazwisko, X. (rok). <i>Tytuł książki</i> . Wydawnictwo.
elektronicznej, z DOI	Nazwisko, X. (rok). <i>Tytuł książki</i> . Wydawnictwo. https://doi.org/xxx .
elektronicznej, bez DOI	Nazwisko, X. (rok). <i>Tytuł książki</i> . Wydawnictwo. https://xxx .
W przekładzie	Nazwisko, X. (rok). <i>Tytuł książki</i> (tłum. Y. Nazwisko). Wydawnictwo.
Wydanie wielotomowe: tom zatytułowany	Nazwisko, X. (rok). <i>Tytuł książki: numer tomu</i> . <i>Tytuł tomu</i> . Wydawnictwo.
tom niezatytułowany	Nazwisko, X. (rok). <i>Tytuł książki</i> (numer tomu). Wydawnictwo.
Kolejne wydanie	Nazwisko, X. (rok). <i>Tytuł książki</i> (numer wydania). Wydawnictwo.
Pod redakcją (niezależnie od języka, w którym książka została wydana)	Nazwisko, X. (red.). (rok). <i>Tytuł książki</i> . Wydawnictwo.
Rozdział i hasło słownikowe/encyklopedyczne	
Rozdział w pracy zbiorowej	Nazwisko, X. (rok). Tytuł rozdziału. W: Y. Nazwisko, Z. Nazwisko 2 (red.), <i>Tytuł książki</i> (s. strona początku–strona końca). Wydawnictwo. https://doi.org/xxx lub https://xxx .
Hasło ze słownika lub z encyklopedii w wersji: drukowanej	Nazwisko autora hasła, X. (rok). Hasło. W: Y. Nazwisko (red.), <i>Tytuł</i> . Wydawnictwo. Hasło. (rok). W: Y. Nazwisko (red.), <i>Tytuł</i> . Wydawnictwo.
elektronicznej	Hasło. (rok, miesiąc i dzień lub „b.r.”). W: <i>Tytuł</i> (np. <i>Wikipedia</i> lub <i>Słownik języka polskiego PWN</i>). https://xxx .
Raporty i szara literatura	
Autor: indywidualny	Nazwisko, X. (rok). <i>Tytuł raportu</i> . Wydawnictwo. https://doi.org/xxx lub https://xxx .
instytucjonalny	Nazwa instytucji. (rok). <i>Tytuł raportu</i> . Wydawnictwo (tylko jeśli wydawcą jest inna instytucja niż instytucja autorska). https://doi.org/xxx lub https://xxx .
Working papers	Nazwisko, X. (rok). <i>Tytuł pracy</i> (nazwa serii i numer). https://doi.org/xxx lub https://xxx .

Typ źródła	Przykład opisu bibliograficznego
Materiały z konferencji	
Opublikowane jako: druk zwarty	zob. przykład opisu książki lub rozdziału
druk ciągły	zob. przykład opisu artykułu w czasopiśmie
Niepublikowane (jedynie wygłoszone)	Nazwisko, X. (rok, dzień i miesiąc). <i>Tytuł pracy</i> [typ wystąpienia, np. referat lub prezentacja]. Nazwa i miejsce (miasto, kraj) konferencji.
Rozprawa doktorska	
Niepublikowana	Nazwisko, X. (rok). <i>Tytuł pracy</i> [niepublikowana rozprawa doktorska]. Nazwa instytucji nadającej tytuł doktorski.
Opublikowana, dostępna w internecie	Nazwisko, X. (rok). <i>Tytuł pracy</i> [rozprawa doktorska, nazwa instytucji nadającej tytuł doktorski]. https://xxx .
Maszynopis	
Niepublikowany / przygotowywany przez autora / zgłoszony do publikacji, ale jeszcze niezaakceptowany	Nazwisko, X. (rok). <i>Tytuł</i> [maszynopis niepublikowany / w przygotowaniu / zgłoszony do publikacji].
Artykuł zaakceptowany do publikacji w czasopiśmie	Nazwisko, X. (w druku). Tytuł artykułu. <i>Tytuł czasopisma</i> .
Opublikowany nieformalnie (np. na stronie internetowej autora)	Nazwisko, X., Nazwisko 2, Y. (rok). <i>Tytuł</i> . https://xxx .
Akt prawny^a	
Polski i UE	Pełny tytuł aktu prawnego wraz z numerem/pozycją w dzienniku urzędowym.
Inny	Pełny tytuł aktu prawnego w języku oryginalnym (w przypadku zapisu w innym alfabecie niż łaciński należy podać tylko transkrypcję) wraz z numerem/pozycją w dzienniku urzędowym. https://xxx .
Tekst na stronie internetowej (dostępny tylko online)	
Znana data publikacji, zawartość strony się nie zmienia (jest archiwizowana)	Nazwisko, X. (rok, dzień i miesiąc). <i>Tytuł</i> . https://xxx .
Nieznana data publikacji, zawartość strony się zmienia (nie jest archiwizowana)	Nazwa instytucji. (b.r.). <i>Tytuł</i> . Pobrane dzień, miesiąc i rok pobrania z https://xxx .
Zbiór danych	
Dane opublikowane: znana data publikacji, zawartość zbioru się nie zmienia (jest archiwizowana)	Nazwisko, X. (rok). <i>Nazwa zbioru danych</i> [zbiór danych]. Wydawca. https://xxx .
nieznana data publikacji, zawartość zbioru się zmienia (nie jest archiwizowana)	Nazwa instytucji. (b.r.). <i>Nazwa zbioru danych</i> [zbiór danych]. Wydawca (tylko jeśli wydawcą jest inna instytucja niż instytucja autorska / właściciel danych). Pobrane dzień, miesiąc i rok pobrania z https://xxx .
Materiały audiowizualne	
Nagranie wideo	Nazwisko, X. (rok, dzień i miesiąc). <i>Tytuł</i> [wideo]. Nazwa kanału, na którym nagranie zostało udostępnione (np. YouTube). https://xxx .
Webinar	Nazwisko, X. (rok, dzień i miesiąc). <i>Tytuł</i> [webinar]. Nazwa instytucji. https://xxx .

^a Wewnętrzne zasady „WS”.

Typ źródła	Przykład opisu bibliograficznego
Posty w serwisach społecznościowych	
Post na portalu X lub Instagramie	Nazwisko, X. lub nazwa instytucji [@nazwa użytkownika] (rok, dzień i miesiąc). <i>Treść – do 20 wyrazów</i> [post]. Nazwa serwisu społecznościowego (X lub Instagram). https://xxx .
Post na Facebooku	Nazwisko, X. lub nazwa instytucji (rok, dzień i miesiąc). <i>Treść – do 20 wyrazów</i> [post]. Facebook. https://xxx . Nazwa instytucji [nazwa użytkownika] (rok, dzień i miesiąc). <i>Treść – do 20 wyrazów</i> [post]. Facebook. https://xxx .

Źródło: opracowanie na podstawie: American Psychological Association. (2020). *Publication manual of the American Psychological Association* (wyd. 7). <https://doi.org/10.1037/0000165-000>.

Praca przygotowana w sposób niezgodny z powyższymi wskazówkami będzie odesłana do autora z prośbą o dostosowanie formy artykułu do wymogów redakcyjnych.

DZIAŁY „WS” – TEMATYKA ARTYKUŁÓW WS SECTIONS – TOPICS OF THE ARTICLES

Pełny opis zakresu tematycznego działów: ws.stat.gov.pl/AimScope

Description of the topics covered in each section: ws.stat.gov.pl/AimScope

Studia metodologiczne / Methodological studies

- Oryginalne teoretyczne rozwiązania metodologiczne ze wskazaniem ich praktycznej użyteczności
- Prace przeglądowe i porównawcze oraz dotyczące etyki w statystyce, które wnoszą pionierski wkład poznawczy do obecnego stanu wiedzy

Statystyka w praktyce / Statistics in practice

- Nowatorskie zastosowania narzędzi i modeli statystycznych oraz analiza i ocena statystyczna zjawisk społeczno-ekonomicznych i innych, prowadzona w szczególności na danych z zasobów statystyki publicznej
- Wykorzystanie narzędzi informatycznych do uzyskiwania i przetwarzania informacji statystycznych, naliczania danych wynikowych, ich prezentacji i rozpowszechniania
- Projektowanie badań statystycznych, uzyskiwanie, integracja i przetwarzanie danych oraz generowanie wynikowych informacji statystycznych i kontrola ich ujawniania

Studia interdyscyplinarne. Wyzwania badawcze / Interdisciplinary studies. Research challenges

- Wyzwania badawcze wynikające z rosnących potrzeb użytkowników danych statystycznych i wymagające zaangażowania znacznych środków oraz rozwiązań z różnych dziedzin nauki i techniki
- Wykorzystanie technologii informacyjnych i komunikacyjnych, innowacyjność, przetwarzanie i analiza zagadnień związanych z data science i big data
- Wyniki badań prowadzonych przez przedstawicieli dyscyplin innych niż statystyka z wykorzystaniem metod statystycznych

Spisy powszechne – problemy i wyzwania / Issues and challenges in census taking

- Propozycje rozwiązań – zarówno organizacyjnych, jak i metodologicznych – możliwych do zastosowania w spisach oraz rezultaty analiz danych spisowych
- Praktyczne aspekty związane z gromadzeniem i udostępnianiem danych ze spisów, w tym dotyczące obciążenia odpowiedzi i ochrony tajemnicy statystycznej

Edukacja statystyczna / Statistical education

- Metody i efekty nauczania statystyki oraz popularyzacja myślenia statystycznego i rzetelnego posługiwania się informacjami statystycznymi
- Problemy związane z kształceniem w zakresie umiejętności stosowania statystyki na wszystkich poziomach edukacji, a także dotyczące wykorzystywania nowoczesnych koncepcji i metod dydaktycznych oraz pomocy naukowych w nauczaniu statystyki

Z dziejów statystyki / From the history of statistics

- Historia prowadzenia obserwacji statystycznych oraz rozwoju ich metodologii i narzędzi
- Życie i osiągnięcia zawodowe wybitnych statystyków, jak również działalność najważniejszych instytucji i organizacji statystycznych w Polsce i za granicą

In memoriam

- Nekrologi i artykuły wspomnieniowe

Informacje. Recenzje. Dyskusje / Discussions. Reviews. Information

- Teksty nierecenzowane i niemające charakteru artykułów naukowych: sprawozdania z konferencji naukowych i innych wydarzeń dotyczących statystyki, recenzje książek, omówienia nowości wydawniczych GUS, polemiki i dyskusje