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DYNAMICS AND STRUCTURAL CHANGES IN RECEIPTS OF SOCIAL PROTECTION SCHEMES IN BULGARIA AND THE EUROPEAN UNION FOR THE PERIOD 2008 – 2016
ДИНАМИКА И СТРУКТУРНЫЕ ИЗМЕНЕНИЯ ДОХОДОВ В СИСТЕМЕ СОЦИАЛЬНОЙ ЗАЩИТЫ В БОЛГАРИИ И В ЕВРОПЕЙСКОМ СОЮЗЕ ЗА ПЕРИОД 2008 – 2016 ГГ.

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Abstract. *The article justifies the necessity and relevance of statistical research in the field of social protection, and in particular the trends and regularities in the dynamics and structure of social protection receipts. Characteristics of social protection receipts have been made in the context of the ESSPROS (the European System of Integrated Social Protection Statistics) statistical information system. The classification of receipts by two main features – by type and by origin – has been classified. On the basis of this classification, structures in terms of quantity have been identified and the empirical analysis has been performed. Using statistical methods for the analysis of dynamics, structural changes and differences, trends and regularities in the social protection receipts in the Republic of Bulgaria and the European Union for the period 2008-2016 have been identified. The data base of the analysis is data from the National Statistical Institute and Eurostat. On the basis of the established regularities in the studied indicators, conclusions about the status and development of social protection receipts are made.*

Key words*: social protection, ESSPROS, receipts, statistical methods, dynamic analysis, structural changes.*

Introduction

The establishment of social protection system to promote the economic and social cohesion of the European Union Member States is one of the main tasks of the common European policies. This is set as one of the priorities of the Europe 2020 Strategy [1] and finds its continuation in establishing the European Pillar of Social Rights, launched on 17th November 2017 [2]. The current set of social tools at European level, such as legislation, mechanisms for coordination and monitoring of national policies, funds, etc. contribute to the social cohesion and the fight against poverty. The social dimension of the EU is manifested in the encouragement and coordination of countries to conduct the social policy that provides social protection and support to the population, effectively combating poverty and social exclusion. Public solidarity in the social field is expressed through benefits made by social protection system.

Statistical monitoring of social benefits and their financing is carried out through the European System of Integrated Social Protection Statistics (ESSPROS). The main target of ESSPROS is to provide a comprehensive, realistic and consistent study of social protection in the Member States. It is specified in three aspects – coverage of social benefits and their financing; ensuring international comparability; harmonisation with other statistics, in particular with national accounts, in terms of basic definitions.

Within its conceptual frameworks, social protection consists of all actions by public and private entities that assist households or individuals in coping with a certain set of risks and needs. In Bulgaria, social protection is provided by social security funds; private pension funds; state and government agencies and local authorities; health insurance companies; employers making payments directly to their current employees; non-governmental organisations that help people in need. These institutions provide funding for social protection.

The object of this study are receipts in social protection system. **The purpose** of this paper is to identify, through statistical methods, objective internal patterns in the dynamics and structure of receipts of social protection systems in Bulgaria and the European Union in the period 2008-2016 and to carry out a comparative analysis.

1. Characteristics of social protection receipts according to ESSPROS

The source of statistical information for the purpose of the survey is the European System of Integrated Social Protection Statistics (ESSPROS). Its legal framework is defined by Regulation (EC) №458/2007 of the European Parliament and the Council [3]. In Bulgaria the monitoring is carried out by the National Statistical Institute.

Statistical information on cash flows related to social protection can be presented in an accounting framework covering the provision of social protection (expenditure) and its financing (receipts) [4, p.105]. For the effective management of cash flows of the social protection system, rules, organized in different systems, have been formulated. In ESSPROS, these are called social protection schemes and they are 18 [5]. They are intended to accumulate receipts and regulate their spending so as to provide protection against a particular risk or need with the focus on certain groups in need of social protection. Therefore, it can be said that these schemes have redistributive functions. Receipts from several institutional units may flow to the same social protection scheme. Thus, the budgets of municipalities provide for the receipts under the scheme for social services carried out by municipalities. At the same time, the same institutional unit can manage and control several schemes. For instance, the National Social Security Institute is responsible for the accumulation and disbursement of funds in the Pensions Fund, Pensions not Related to Labour Activity Fund, Work Injury and Occupational Disease Fund, General Disease and Maternity Fund, Unemployment Fund, Teachers' Pension Fund.

ESSPROS classifies receipts to social protection schemes into two aspects – by type and by origin. The classification *by type* is based on the nature and reason for a payment. Under this criterion, receipts can be formed through social security contributions, central government contributions, transfers from other schemes or other receipts.

The costs incurred in acquiring the right to social benefits from the insured people or from employers at the expense of their employees form the group of *social security contributions*. This also applies to contingent social security contributions on mandatory and uncontrolled by government social protection schemes. Payments of social security contributions can be made by employers, so their employees, former or current, can acquire the right to receive social security benefits. In order to obtain or retain their right to social benefits, contributions to social protections schemes can

also be made by individuals and households – employed, self-employed, retired etc.

The central government's contributions to the schemes are both the government's expenditure on managing non-contributory schemes[1] and the government's financial support for local social protection schemes. Transfers of tax revenues intended to finance social protection form reserve funds. The remaining government contributions form the total receipts resulting from the transfer funds from other sources.

Part of the receipts to social protection schemes can be generated as a result of *transfers from other schemes*. Therefore, two cash flows are recorded – the first one is the expenditure for the payment scheme and the second one is the revenue for the recipient scheme. Social security contributions redirected from other schemes are some: from the State Social Security Fund – for pensioners and the unemployed, from the state budget – for the benefit of children, from the Social Assistance Agency – for uninsured people entitled to social assistance. In order to reduce the deficit of the recipient scheme, other transfers from resident schemes are also used.

Current and capital receipts under social protection schemes form the group of *other receipts*. The origin of revenue designated as property income is mainly from interest and dividends. Other revenues are donation receipts, claims against debtors, wills of individuals and legal entities, etc.

The basis for the classification of social protection receipts **by origin** is the institutional sector that provides the funding. Institutional sectors are groups of institutional units with equal economic behaviour. In order to be defined as an institutional unit, business operator must be independent in the decision-making process to carry out its essential function and work out or maintain a complete set of accounts. Seven groups are defined corresponding to institutional sectors and sub-sectors: corporations; central government; state and local government; social security funds; households; non-profit institutions serving households; the rest of the world.

The group of *corporations* combines non-financial and financial corporations, institutional sectors according to the European System of Accounts 2010. They combine institutional units whose main activity is the production of goods and services on the market.

The next three groups are subsectors of the institutional sector "General Government". Cash receipts to the schemes, whose source is the government institutional units with authority over the entire territory of the country and the units they control and finance, form receipts from *the central government*. Receipts from *state and local governments* originate from institutional units with authority limited to part of the territory of the country and from the units they control and finance. Through the group of *social security funds*, financial means from public social security funds, regardless of their territorial location, are received. This subsector includes the National Social Security Institute and the National Health Insurance Fund.

The other three groups of the classification according to the origin of social

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[1] No financial contribution, i.e. payment of social security contributions, is required from the recipient to provide social protection.

protection receipts correspond to the institutional sectors. The *household* group provides receipts to the schemes through persons or groups of persons who are consumers or unincorporated manufacturers of market goods and financial services intended exclusively for own final consumption. As local legal entities serving households and private non-market producers, *non-profit institutions serving households* provide social protection income in their capacity as employers. These include trade unions, political parties, scientific societies, community clubs, charitable organisations, etc. *The rest of the world* group provides receipts through all institutional units that are non-resident for the national economy and are linked to economic relationships with resident institutional units. ESSPROS covers transactions in this sector only insofar as they are linked to local protection schemes.

2. Analysis of the dynamics of social protection receipts

The study of the dynamics of social protection receipts is made by descriptive analysis. It comes down to calculating summarising numerical characteristics that reflect the general regularities in the order development without seeing the causes. [6, p.21]

On the basis of indicators related to social protection receipts in Bulgaria and the European Union in the period 2008-2016, time series are constructed. These are annual in frequency and cover the period from 2008 to 2016. To ensure comparability, a measurement unit of EUR 1 billion was selected at 2010 prices. Deflation is carried out by the indicator characterising individual consumption.

The time series are shown in Figure 1. Graphical depiction of the development of the two indicators show a systematic upward trend. Total receipts in social protection systems in Bulgaria and in the European Union increased from EUR 6.10 billion and EUR 3673.88 billion in 2008 to EUR 8.43 billion and EUR 4116.96 billion in 2016 respectively, i.e. by EUR 2.33 billion and by EUR 443.08 billion in absolute terms and by 38.26% and 12.06% in relative terms.

Kendall and Spearman's rank correlation coefficient and first-order autocorrelation coefficient are used to identify the development trend. Shorter series make it more difficult to apply more powerful methods because their specific requirements are violated.
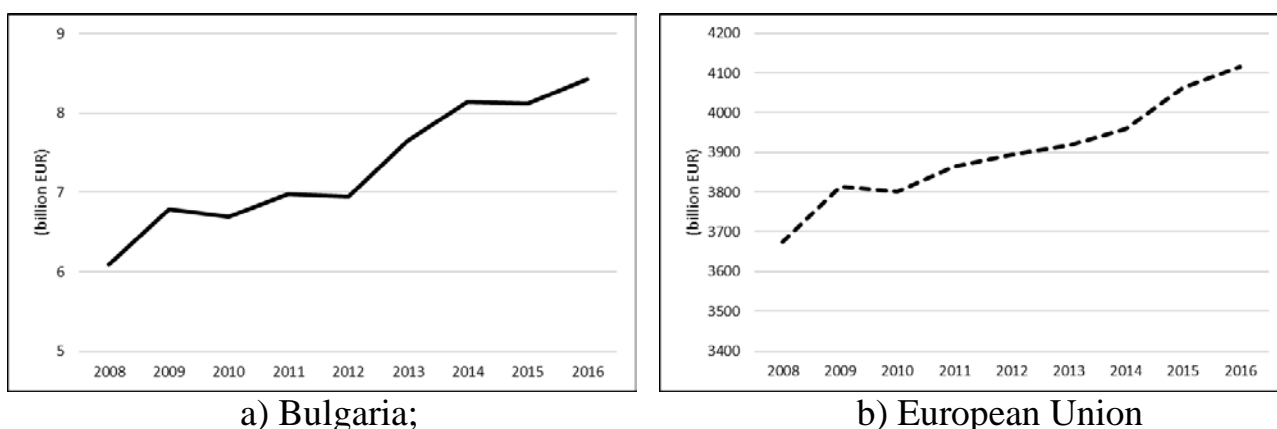
a) Bulgaria;   b) European Union

Fig. 1. Social protection receipts in the period 2008-2016.
(by prices of 2010)

Data source: Eurostat-Social protection-DataDatabase- Social protection Receipts. https://ec.europa.eu/eurostat/.

The empirical value of Spearman's coefficient for social protection receipts in Bulgaria is $\rho_{em} = 0,950$, and for the European Union is $\rho_{em} = 0,983$. For Kendall's rank coefficient, the corresponding values for Bulgaria and the European Union are $\tau_{em} = 0,833$ and $\tau_{em} = 0,944$. Since all the empirical values of the rank correlation coefficients are higher than the corresponding theoretical values, the null hypothesis of no trend in series under consideration is rejected. This leads to the conclusion that there is an upward trend in the development of social protection receipts in Bulgaria and in the European Union.

The descriptive indicators characterising the dynamics of receipts in the social protection system in Bulgaria and in the European Union are shown in Table 1. The juxtaposition of absolute growth and the rate of development on the chain basis of the social protection receipts in Bulgaria and in the European Union confirms the general nature of the development of the two indicators. At the same time, there may be some differences. The changes in the social protection receipts in Bulgaria and in the European Union are one-way for the whole study period, except for 2012 and 2015, when the receipts in Bulgaria decrease and those in the European Union increase. The average absolute growth of social protection receipts in Bulgaria is EUR 0.30 billion and that of the European Union is EUR 56.78 billion. In relative terms, the average increase in social protection receipts in Bulgaria is 3.93%, and in the European Union – 1.24%.

Table 1.

Descriptive indicators for the dynamics of receipts in the social protection system in Bulgaria and in the European Union for the period 2008 -2016.

Indicators		2009	2010	2011	2012	2013	2014	2015	2016	Average for the period
Bulgaria	$\Delta_{i/i-1}$ (billion EUR)	0.70	-0.10	0.28	-0.02	0.70	0.49	-0.02	0.31	**0.30**
	$T_{i/i-1}$ (%)	111.42	98.54	104.21	99.66	110.03	106.37	99.78	103.82	**103.93**
European Union	$\Delta_{i/i-1}$ (billion EUR)	141.12	-12.62	62.65	28.50	24.44	42.38	103.62	52.98	**56.78**
	$T_{i/i-1}$ (%)	103.84	99.67	101.65	100.74	100.63	101.08	102.62	101.30	**101.24**
Outperformance ratio (%)		107.30	98,87	102.52	98.93	109.34	105.23	97.23	102.49	**102.49**

Source: author's calculations

It gives the impression that the relative increase in social protection receipts in the European Union is more sustainable than in Bulgaria. The rank of dispersion of the indicator for the European Union is 4.17% while that for Bulgaria is 11.76%.

Comparing the change in social protection receipts in Bulgaria and in the European Union reveals the different rate at which the two indicators change. Over the entire studied period, except for 2010, 2012 and 2015 when receipts in Bulgaria are declining, social protection receipts in Bulgaria are growing faster than those in the European Union. The average outperformance ratio is 102.49% and shows that receipts in Bulgaria rise by 2.49 percentage points faster than those in the European Union.

3. The analysis of structural changes in social protection receipts

The structural changes in social protection receipts are examined by major classification indications – type and origin, using methods for analysing structural changes and differences. By identifying trends in the development of the examined structures, structural changes from one period to another are measured, determining how sharp they are, whether they accelerate or decline [7, p.21]. The analysis in the statics makes it possible to draw conclusions about the peculiarities of social protection receipts in different periods by calculating the coefficients of structural differences. The analysis is done by measuring the differences between the revenue (receipts) structures in Bulgaria and the European Union, formed on different grounds [8, p.106].

The structures of social protection receipts in Bulgaria and the European Union for the period 2008-2016 by type are presented in Table 2. Predominant share in the structure of social protection receipts in Bulgaria by type is occupied by the social security contributions and contributions of central government, and their total share exceeds 97% during the whole period. They have similar values, as in the majority of the period social security contributions prevail – 53.99% versus 44.48% for central government contributions (2008), 49.60% versus 48.64% (2009), 49.20% versus 48.67% (2013), 49.22% versus 48.79% (2014), 50.78% versus 47.39% (2015) and 52.14% versus 46.28% (2016). For the rest of the period, central government contributions exceeds the share of social security contributions, as the difference between the two is declining.

The relative share of other receipts occupies a very small part in the structure and changed from 1.53% in 2009 to 2.13% in 2013 when its highest value was. This type of receipts has a negligible effect on the dynamics of relative shares of other two receipt groups because of the long-established minimum relative share.

The low level of the relative shares of other receipts and their insignificant scope is a circumstance which gives rise to behaviour of the studied structure resembling a two-element structure – in response to the increase of the relative share of one group, the relative share of the other one declines. The share of social security contributions decreased in the period 2008-2010 remained constant between 2010 and 2012, and then increased until the end of the studied period. The share of government contributions increased in the period 2008-2010, remained constant in the period 2010-2012, decreased in the period 2012-2016.

As already noted, during the period, the share of social security contributions exceeds the corresponding share of government contribution, except for the 2010-2012 sub-period. Furthermore, the variation in the different groups is relatively low and very similar in value. The coefficient of variation in the share of social security contributions amounts to 4.55%, and in the contribution of the government – to 4.44%. This is the reason to conclude that the structure of receipts by types in Bulgaria is relatively stable during the studied period.

In the structure of social protection receipts in the European Union by type, like the similar structure for Bulgaria, the main part is occupied by social security contributions and contributions of the central government, and the remaining small part – by other receipts. Nevertheless, there are significant differences in the

dynamics of individual revenue groups.

Table 2.

Receipt structure of the social protection system in Bulgaria and the European Union for the period 2008-2016 by types

(%)

years	Social security contributions	Contributions of central government	Other receipts	total
Bulgaria				
2008	53.99	44.48	1.53	**100.00**
2009	49.60	48.64	1.76	**100.00**
2010	47.01	51.21	1.79	**100.00**
2011	47.27	50.87	1.86	**100.00**
2012	47.09	51.08	1.84	**100.00**
2013	49.20	48.67	2.13	**100.00**
2014	49.22	48.79	1.99	**100.00**
2015	50.78	47.39	1.83	**100.00**
2016	52.14	46.28	1.58	**100.00**
European Union				
2008	55.69	38.35	5.96	**100.00**
2009	54.68	39.85	5.47	**100.00**
2010	54.90	39.38	5.72	**100.00**
2011	54.51	40.15	5.33	**100.00**
2012	54.27	40.53	5.19	**100.00**
2013	54.41	40.36	5.23	**100.00**
2014	54.01	40.44	5.55	**100.00**
2015	53.19	41.23	5.58	**100.00**
2016	54.61	40.30	5.10	**100.00**

Source: *author's calculations*

The first trend that stands out is that during the entire period social security contributions have a predominant share exceeding 50% of total receipts (despite the slight variation over the years). Their share ranges between 55.69% in 2009 and 53.19% in 2015, as the coefficient of variation is just 1.16%. There is a downward trend – from 55.69% in 2008 to 53.19% in 2015, then it increases and reaches 54.61% in 2016.

The share of central government contributions is the second largest one in the European structure of social protection receipts throughout the period but it is significantly lower than those in Bulgaria. As it can be seen from the data in Table 2, it ranges between 44.48% and 51.21%, while in the European Union – between 38.35% and 41.23%. It shows a trend of increase during 2008 - 2015 from 38.35% to 41.23%, then it decreases to 40.30% in 2016. The variation is slightly larger than that of the share of social security contributions, but it remains weak – the coefficient of variation is about 1.11% i.e. for both shares in the European structure the variation is much lower than in Bulgaria.

The share of other receipts in the European receipts structure remains the lowest one but higher than that in the national structure. During the whole period it is between 5% and 6%, unlike in Bulgaria, where it is between 1% and 2%.

Data on the structure of receipts by origin are presented in Table 3. In Bulgaria, the relative share of central government receipts is the largest in the whole survey period – between 56.07% and 49.07%, followed by a share of corporate receipts – between 21.40% and 25.45%. Third is the share of household receipts – between 16.81% and 23.32%. The share of the other receipt groups is relatively low – receipts from state and local governments are just 3%, and receipts from social security funds, non-profit institutions serving households and the rest of the world – less than 1%. The total share of these receipt groups during the whole period does not exceed 5%.

Table 3.
Receipt structure of the social protection system in Bulgaria and the European Union for the period 2008-2016 by origin

(%)

years	corporations	Central government	State and local government	Social security fund	households	non-profit institutions serving households	The rest of the world	total
Bulgaria								
2008	24.39	49.84	3.47	0.15	21.82	0.25	0.08	**100.00**
2009	23.62	52.74	3.32	0.25	19.45	0.29	0.33	**100.00**
2010	23.37	56.07	3.05	0.27	16.83	0.23	0.18	**100.00**
2011	23.79	54.83	3.72	0.33	16.81	0.25	0.27	**100.00**
2012	21.40	54.26	3.84	0.28	19.72	0.23	0.27	**100.00**
2013	25.15	51.83	3.62	0.23	18.87	0.20	0.10	**100.00**
2014	25.45	52.00	3.19	0.24	18.84	0.19	0.09	**100.00**
2015	22.24	51.97	3.12	0.07	22.28	0.22	0.10	**100.00**
2016	24.15	49.07	3.07	0.08	23.32	0.25	0.06	**100.00**
European Union								
2008	30.20	33.91	13.69	1.10	20.07	0.47	0.56	**100.00**
2009	29.09	35.10	13.90	1.09	19.88	0.49	0.45	**100.00**
2010	29.38	34.62	14.12	1.07	19.96	0.50	0.35	**100.00**
2011	28.86	35.43	13.91	1.07	19.83	0.49	0.41	**100.00**
2012	28.62	35.87	13.70	1.01	19.91	0.49	0.40	**100.00**
2013	28.61	35.50	13.77	1.02	20.18	0.51	0.41	**100.00**
2014	28.67	35.56	13.79	1.00	20.06	0.52	0.40	**100.00**
2015	28.33	36.07	14.06	0.97	19.71	0.50	0.36	**100.00**
2016	28.59	35.27	13.96	0.86	20.41	0.53	0.38	**100.00**

*Source***:** author's calculations

The European structure of receipts by origin is of a similar nature regarding the ranking of the individual sources by size. Here again, the share of central government receipts is the highest, followed by the shares of corporation and household receipts. Fourth is the share of state and local government, followed by the low shares of other groups. The difference between the European and national structure of receipts by origin is to a greater degree of equability between the different sources. The share of central government receipts in Bulgaria exceeds on average about twice the receipts share of corporations, while in the European Union this difference is about 25%. The share of receipts from state and local government in the European Union ranges between 13% and 14%, compared to Bulgaria – between 3% and 4%. The situation with the other receipt groups is similar – although they remain minimal in the overall structure, they are significantly larger than those in the Bulgarian structure.

The intensity of changes in the receipt structure of the social protection system in Bulgaria for the period 2008-2016 has been studied using the integral coefficient of structural changes [7, p.44], calculated on the basis of the previous year. The values of the integral coefficient for changes in the structure of social protection receipts by type are presented in Table 4.

Table 4.

Integral coefficient of structural changes and differences by type and origin of social protection receipts in Bulgaria and the European Union for the period 2008-2016

Years	Changes in the receipts structure by type			Changes in the receipts structure by origin		
	Structural changes		Structural differences Bulgaria/EU	Structural changes		Structural differences Bulgaria/EU
	Bulgaria	EU		Bulgaria	EU	
2009/2008	0.061	0.020	0.079	0.045	0.023	0.252
2010/2009	0.037	0.006	0.111	0.048	0.009	0.266
2011/2010	0.004	0.010	0.152	0.017	0.014	0.308
2012/2011	0.003	0.005	0.138	0.044	0.007	0.281
2013/2012	0.033	0.002	0.136	0.053	0.006	0.274
2014/2013	0.002	0.005	0.106	0.006	0.002	0.246
2015/2014	0.021	0.012	0.106	0.055	0.010	0.249
2016/2015	0.018	0.018	0.078	0.043	0.015	0.255

Source: author's calculations

The results obtained show slight structural changes in both directions of analysis – in dynamics and in static, and for both structures – by types and by origin. At the same time, it should be noted that the changes in the dynamic aspect are much smaller than those characterizing the differences between Bulgaria and the European Union. Moreover, the intensity of differences in structure by origin of receipts between Bulgaria and the EU proves to be stronger than changes in types of receipts. Generally, the low values of the calculated coefficients indicate a relatively stable structure of social protection receipts during the studied period.

Conclusion

One of the main priorities of social protection in the European Union is the provision of an effective system of receipt collection and regulation of their spending. The analysis of the dynamics and structure of social protection receipts in Bulgaria and the identification of the country in the EU as its full member give rise to the following conclusions and summaries:

•Analysis of the dynamics of social protection receipts shows a statistically significant upward trend, both at European and national level. In Bulgaria, the growth rates are higher than those of the European Union, as receipts over the period grow by 38.26% and the growth rate for the EU is 12.06%.

•The structure of social protection receipts by type in Bulgaria is close to that in the EU, as the relative share of receipts from social security contributions and central government contributions is predominant.

•The structure of receipts by origin in Bulgaria is similar to that in the EU in terms of the place of individual receipt groups in their overall ranking by size. However, the difference among the groups in the structure at European level are much smaller, which makes it more uniform than that at national level.

•The values of the integral coefficient of structural changes and differences, by which their intensity in dynamics and static are measured, show that the changes are weak which leads to the conclusion that the structures under the studied characteristics are stable in dynamic aspect, and in static – structures in Bulgaria are approaching closer to the European average.

The open method of coordination in the field of social protection determines the need for reliable and harmonized statistics at national and European level. This requires further expansion and improvement of statistical survey in this area. The exchange of good practices and innovative approaches will increase the effectiveness of coordination among participants in these studies and the quality of information needed to develop EU policies and strategies in the field of social protection and social inclusion.

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Аннотация. В статье обосновывается необходимость и актуальность статистических исследований в области социальной защиты и, в частности, тенденций и закономерностей в динамике и структуре доходов, предназначенных для социальной защиты. Дается характеристика доходов для социальной защиты в контексте статистической информационной системы ESSPROS (Европейская система интегрированной статистики социальной защиты) и выясняется классификация доходов по двум основным признакам – по виду и по происхождению. На базе этой классификации определены в количественном аспекте структуры, на основе которых проводился эмпирический анализ. С помощью статистических методов анализа динамики, структурных изменений и различий установлены тенденции и закономерности формирования доходов для социальной защиты в Р Болгарии и Европейском союзе за период 2008-2016 гг. Информационной базой анализа являются данные Национального статистического института и Евростата. На основании установленных закономерностей изучаемых показателей были сделаны выводы о состоянии и развитии доходов для социальной защиты.

Ключевые слова: социальная защита, ESSPROS, доходы, статистические методы, динамический анализ, структурные изменения.

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