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## The information services sector: defining the extent of public regulation ensuring its development

**Abstract.** The author defines the extent of public regulation (government intervention) in the information services sector, namely, in the information services provision process via post and Internet needed to ensure its development. There have been used the postal services freedom (PSFi) and e-services freedom (ESFi) Sub-indices included in the Index of liberalism (dirigisme) of information services to measure the liberalism (dirigisme) degree of the information services provision process. The methodology of the Index has been prepared according to the philosophy of assessing the degree of government intervention in the economy by Professor N. Muzaffarli.

The relationship between the degree of government intervention in the information services sector and development indicators of sector has been analyzed. The study revealed that there is no decrease in the indicators of number of international outbound letter mail services and domestic letter mail services with the increase of the degree of government intervention in the information services provision process via post in European countries. Moreover, in most countries with more dirigiste information services provision process via post, the indicators are higher than in countries with lower degree of government intervention in this process. The fact that the increasing degree of dirigisme of the information services provision process via post in European countries does not have negative impact on the development of the information services sector is also proved by the result that an increase of the PSFi does not decrease the turnover from the provision of domestic letter mail services. Instead, the indicator of most European countries with a higher degree of government intervention in the information services provision process via post is higher than in countries with more liberal postal services. An entirely different picture has emerged in the countries of Commonwealth of Independent States (CIS) which are former Soviet republics: with an increased postal services' dirigisme degree, the indicators of post offices' activity for the information services provision are too low. It indicates that in these countries an increased dirigisme degree of postal services may impede the development of information services sector, and to ensure its development, liberalization of the services is vital.

The study also allowed determining that creation of favourable competitive conditions in the field of Internet and telephony by governments of European as well as CIS countries could increase the share of books, magazines, and e-learning materials buyers via Internet in the total number of citizens.

**Keywords:** Information Services; Liberalism; Dirigisme; Government Intervention; Public Regulation; Information; Postal Services; E-Services

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**Сфера інформаційних послуг: визначення ступеня державного регулювання,  
що сприяє її розвитку**

**Анотація.** Стаття присвячена визначенню ступеня втручання держави в сферу інформаційних послуг, необхідного для забезпечення її розвитку, а саме, у процес надання інформаційних послуг за допомогою пошти й Інтернету. Для вимірювання ступеня ліберальності (дирижизму) процесу надання

інформаційних послуг використані субіндекси свободи поштових послуг (СППі) й електронних послуг (СЕПі), що входять до складу Індексу ліберальності (дирижизму) інформаційних послуг. Методологія даного Індексу розроблена, базуючись на філософії оцінювання ступеня державного втручання в економіку професора Н. Музаффарлі.

Проведено аналіз взаємозв'язку між ступенем державного втручання в сферу інформаційних послуг і показниками розвитку цієї сфери. Виявлено, що в країнах Європи при підвищенні ступеня державного втручання в процес надання інформаційних послуг за допомогою пошти показники числа наданих послуг відправлення листів поштою за кордон і в межах країни не скорочуються. Навпаки, у більшості країн із більш дирижистським процесом надання інформаційних послуг за допомогою пошти показники вищі, ніж у країнах із меншим ступенем державного втручання в цей процес. Факт того, що підвищення в країнах Європи ступеня дирижизму процесу надання інформаційних послуг за допомогою пошти не має негативного впливу на розвиток сфери інформаційних послуг підтверджує й те, що підвищення СППі не призводить до зменшення обороту від надання послуг відправлення листів поштою в межах країни. Навпаки, у більшості європейських країн із більш високим ступенем державного втручання в процес надання інформаційних послуг за допомогою пошти показник вище, ніж у країнах із більш ліберальними поштовими послугами.

Зовсім інша картина спостерігається в країнах СНД: при підвищеному ступені дирижизму поштових послуг показники діяльності поштових відділень щодо надання інформаційних послуг низькі. Це свідчить про те, що підвищений ступінь дирижизму поштових послуг у цих країнах може перешкоджати розвитку сфери інформаційних послуг, і для забезпечення її розвитку необхідна їх лібералізація.

Дослідження дозволило також встановити, що створення державами Європи та СНД сприятливих конкурентних умов в області Інтернету й телефонії може сприяти збільшенню частки покупців книжок, журналів й електронних навчальних матеріалів через Інтернет у загальній кількості громадян.

**Ключові слова:** інформаційні послуги; пошта; Інтернет; ліберальність; дирижизм; державне втручання; інформація; регулювання.

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#### **Сфера информационных услуг: определение степени государственного регулирования, способствующей ее развитию**

**Аннотация.** Стаття посвящена определению степени вмешательства государства в сферу информационных услуг, а именно, в процесс предоставления информационных услуг посредством почты и Интернета, необходимой для обеспечения ее развития. Для измерения степени либеральности (дирижизма) процесса предоставления информационных услуг использованы субиндексы свободы почтовых услуг (СПУи) и электронных услуг (СЭУи), входящие в состав Индекса либеральности (дирижизма) информационных услуг. Методология данного Индекса разработана, основываясь на философии оценивания степени государственного вмешательства в экономику профессора Н. Музаффарли.

Проведен анализ взаимосвязи между степенью государственного вмешательства в сферу информационных услуг и показателями развития этой сферы. Виявлено, что в странах Европы при повышении степени государственного вмешательства в процесс предоставления информационных услуг посредством почты показатели числа оказанных услуг по отправке писем по почте за границу и в пределах страны не сокращаются. Более того, в большинстве стран с более дирижистским процессом предоставления информационных услуг посредством почты показатели более высокие, чем в странах с меньшей степенью государственного вмешательства в данный процесс. Факт того, что повышение в европейских странах степени дирижизма процесса предоставления информационных услуг посредством почты не имеет отрицательного влияния на развитие сферы информационных услуг подтверждает и то, что повышение СПУи не приводит к уменьшению оборота от оказания услуг по отправке писем по почте в пределах страны. Напротив, в большинстве европейских стран с более высокой степенью государственного вмешательства в процесс предоставления информационных услуг посредством почты показатель выше, чем в странах с более либеральными почтовыми услугами.

Совершенно иная картина наблюдается в странах СНГ: при повышенной степени дирижизма почтовых услуг показатели деятельности почтовых отделений по предоставлению информационных услуг низкие. Это свидетельствует о том, что повышенная степень дирижизма почтовых услуг в таких странах может препятствовать развитию сферы информационных услуг, и для обеспечения ее развития необходима их либерализация.

Исследование позволило также установить, что создание государствами Европы и СНГ благоприятных конкурентных условий в области Интернета и телефонии может способствовать увеличению доли покупателей книг, журналов и электронных учебных материалов через Интернет в общем числе граждан.

**Ключевые слова:** информационные услуги; почта; Интернет; либеральность; дирижизм; государственное вмешательство; информация; регулирование.

## 1. Introduction

As the result of the implementation of information-communication technologies in different fields of life, we can see that importance of information on the background of other factors of production is growing. The volume of information services provided all around the world - services for the collection, processing and dissemination of information - also increases. From the standpoint of formation of effective, competitive information services sector that makes a significant contribution in the development of country's economy, measures that are taken by the government in this sphere are of overriding importance. Public regulation of information services sector, as well as the regulation of other sectors of the economy, includes a wide range of measures. Its mechanisms include working out and improvement, taking into account national priorities for the development of sector, legal framework, the establishment of state duties, taxes, rules for issuing licenses, etc. In countries where mechanisms of government regulation of the sector are more rigid, the information services sector is less liberal (more dirigiste). And vice versa, the use of less rigid regulatory mechanisms by government indicates that sector is more liberal. We can assume that high degree of government's sector regulation or its intervention into the sector (barriers creation on the way of consumption of information services) may harm enterprises that are providing information services. At the same time, the complete absence of government regulation can have negative consequences both for the sector itself and for the country's economy as a whole.

The analysis of how the information services sector's development indicators vary depending on its government's regulation degree, the determination of the extent to which the government should intervene in the sector to ensure its development, is an important research subject, the conduction of which may be useful in forming of strategic priorities for the sector's development.

## 2. Brief Literature Review

The study uses a new approach of measuring the degree of government intervention in the information services sector, accordingly studies on determining the extent to which the government should intervene in the information services sector for providing its development using the same approach, have not been previously observed. However, one can find a considerable number of studies devoted to assessing the freedom of information and studying its significance for the country. Among the organizations that assess freedom of information are the Soros Foundation, which examines the availability of information in 14 countries (Open Society Institute, 2006); the Freedom House (Freedom House, 2017) which uses for measuring the liberalism degree of information and mass media issues, that don't allow to compare such indicators of countries as value added tax (VAT), cost of broadcasting licenses, etc.; the Friedrich Ebert Foundation (FES, 2015), which assesses media freedom in different countries of the world (scores and reports of countries, as the organization notes, are not comparable with each other). Freedom of information is also being assessed in Australia, Sweden, South Africa, the USA and Thailand (Lidberg, 2009). There is an Open Data Barometer Index, in the methodology of which there are also no statistical indicators that makes possible to assess the degree of government intervention in the information services provision process (World Wide Web Foundation, 2016).

There are also organizations which assess the Internet freedom and the freedom of information provided via Internet - Freedom on the Net Index, for instance. Such indicators of the Index as infrastructural and economic barriers to access, ownership control over Internet and mobile phone access providers, the diversity of online news media, could be used in the calculating of the e-services freedom Sub-index, but data for most of the countries studied in this work are not available (Freedom House, 2019). The Economist Intelligence Unit calculates the Inclusive Internet Index. One of the indicators of the Index - specifically, the availability of Internet content in the local language - is an important indicator reflecting the availability of the information in the Internet for local population, since the availability of the information in foreign language can significantly impede its consumption by people who don't speak the language. However, there are no indicators for most of the countries studied in this work (The Economist Intelligence Unit, 2020). In one of its reports the World Wide Web Foundation calculates the Affordability Drivers Index assessing various factors of Internet accessibility (market concentration, infrastructure indicators, investments in the sector, etc.; at the same time, the group of countries studied by the organization is not the same with the group of countries researched in the study) (World Wide Web Foundation,

Alliance for Affordable Internet, 2018). Previously, the organization has been calculating the Index (Web Index) assessing the degree of the Internet freedom and openness (the indicator reflected the political and legal aspects of ensuring of the Internet freedom, which is not included in the objectives of this study) (World Wide Web Foundation, 2014). The Ericsson AB has developed the Networked Society City Index, which along with other important indicators allows to evaluate tariffs, transit prices of the Internet Protocol (IP) (meanwhile it's important to note that the cities not countries are ranked) (Ericsson AB, 2016). The European Commission calculates the Digital Economy and Society Index (DESI) (the group of countries studied by the European Commission does not quite coincide with the group of countries researched in the study) (European Commission, 2020b).

There is also a considerable amount of researches devoted to study the information freedom consequences (where «freedom of information», in most cases, means freedom of speech, freedom of the press). Among these researches are: study analyzing the impact of information freedom laws on the bureaucratic effectiveness and confirming the positive relationship between them (Vadlamannati & Cooray, 2016); study analyzing whether the Freedom of Information Act accepted in Liberia enhances transparency of government and free information flow of the state (Svärd, 2016); study analyzing whether information freedom laws increase transparency of government (Grimmelikhuijsen et al., 2019). However, the ultimate goal of all of these researches, as it was mentioned, is to indicate the importance of ensuring the freedom of information as indispensable human right for speech freedom.

Since VAT is one of the main indicators reflecting the degree of liberalism (dirigisme) of the information services provision process via post and Internet, the observation of studies analyzing consequences of changes in VAT rate is no less of importance. For example, in one of such researches it is noted that a decrease in VAT rate is beneficial for both, the state and taxpayers (Mach, 2018). As a result of the study of the impact of VAT on Nigeria's state revenue, a positive relationship was established between them (Onaolapo & Fasina, 2013). A positive impact of VAT on GDP confirms the study held by another group of researchers. (Adegbie, Olajumoke, & Kwarbai, 2016) There are also researchers claiming that changes occurring in VAT rates are not particularly significant for tax revenues (Antwi, Ebenezer & Xicang, 2012).

**3. The Purpose** of the paper is to identify to what extent the government should intervene in the information services sector, in the information services provision process via post and Internet, in order to achieve its development. For us to attempt to answer this question, it is necessary to measure the degree of government intervention in the information services provision process via post and Internet, and to analyze how some development indicators of the information services sector vary, depending on postal and e-services' liberalism (dirigisme) degree.

#### 4. Materials and Methods

To measure the degree of government intervention in the information services sector (information services provision process via post and Internet) we use a methodology worked out on the base of assessment philosophy for government's intervention degree in the economy proposed by Prof. N. Muzaffarli (Muzaffarli, 2014) - postal services freedom Sub-index (PSFi) and e-services freedom Sub-index (ESFi) included in the Index of liberalism (dirigisme) of information services (IL(D)IS) (Allakhverdieva, 2019). The Index, respectively its Sub-indices and indices vary from 0 to 1. Indexation is carried out according to the following formula:

$$(V_i - V_{min}) / (V_{max} - V_{min}). \quad (1)$$

After indexation only the indicator of Internet and telephony competition calculated by the World Economic Forum (the WEF) (The World Economic Forum, 2016), was deducted from 1 (since according to the WEF, a higher indicator means a higher degree of liberalism of Internet and telephony, and a higher IL(D)IS and its indicators - a higher degree of government intervention in the information services provision process). Thus, the higher the PSFi and the ESFi are (respectively their indices), the higher is the degree of dirigisme of information services sector, while lower indicators point to lower degree of government intervention in the sector.

The postal services freedom Sub-index consists of two indices and is calculated according to the following formula:



$$\text{Postal services freedom Sub-index} = 0.5 * \text{VAT on postal services Index} + 0.5 * \text{VAT on stamps Index} . \quad (2)$$

The e-services freedom Sub-index consists of two indices and is calculated according to the following formula:

$$\text{E-services freedom Sub-index} = 0.5 * \text{VAT on e-services Index} + 0.5 * \text{Internet and telephony competition Index} . \quad (3)$$

As it is seen, one of the main indicators used in calculating of the postal services freedom and e-services freedom Sub-indices is a value added tax (VAT). VAT being one of the government's regulation mechanisms of enterprises' activities for supplying, in this case, postal and electronic services, allows us to assess the government's intervention degree in the process of their provision. An increased VAT rate can affect negatively on the consumption of these services. There is no doubt that there are also other indicators, the use of which would improve the developed methodology for measuring the liberalism (dirigisme) degree of information services. For example, while calculating the e-services freedom Sub-index there could be used fixed broadband Internet tariffs, but only if the indicator would have been calculated based on tariffs set by the government. An affordable corresponding indicator implies the tariffs of the operator with the largest market share, as measured by the number of subscriptions. In the methodology of calculating of this indicator operators are not divided into private and public (ITU, 2020). Consequently, the use of this indicator does not allow to determine the degree of government intervention in the information services provision process via Internet. Another indicator that determines the degree of ease of entry into the information services market is the average value of Domain registration prices per year (in EUR) (Marcaria.com, 2020). However, the lack of information on whether prices are set by the government makes the use of this indicator while calculating the e-services freedom Sub-index impossible. As we see, difficulties with access to the necessary information in different countries of the world needed to enhance developed methodology temporarily compel us to confine ourselves only with the above indicators.

VAT indicators for European countries are taken from reports prepared by the European Commission (European Commission, 2020a; European Commission, 2020c), the indicators for the rest of the countries are taken from the tax codes of these countries. The Internet and telephony competition indicator is taken from the report of the World Economic Forum (The World Economic Forum, 2016). As the development indicators of the information services sector we use the following (available for the studied countries) indicators: the number of international outbound letter mail services, per 1 inhabitant (European Commission, 2018b); the number of domestic letter mail services, per inhabitant (European Commission, 2018a); the turnover from the provision of domestic letter mail services, per 100 people (European Commission, 2018c); the share of books, magazines and e-learning material buyers via Internet in total number of citizens (nationals) (Eurostat, 2018). In the study there are also used the post offices' performance indicators for the information services provision in the CIS countries provided by the State Statistical Committee of the Republic of Azerbaijan (The State Statistical Committee of the Republic of Azerbaijan, 2019), as well as data of the World Bank on the population (The World Bank, 2018b) and GDP per capita (The World Bank, 2018a).

### PSFi and ESFi by country

Table 1 shows the degree of liberalism (dirigisme) of the information services provision process via post (postal services' liberalism (dirigisme) degree); Table 2 shows the degree of liberalism (dirigisme) of the information services provision process via Internet (e-services' liberalism (dirigisme) degree) in 32 countries of the world.

The country where the government intervenes in the information services provision process via post to a lesser extent is Malta (0.180). The implementation in Denmark and Sweden of the maximum VAT on postal services (25%) among all studied countries and high VAT on postal stamps (25%; the maximum VAT is observed in Hungary - 27%), caused the countries to be the most dirigiste on the Sub-index among all studied countries (PSFi here is 0.500). 18 countries are located to the right, 14 countries - to the left of the relative center (0.315).

The most liberal country on the ESFi is France (0.092; the minimum VAT on e-services (9.2%) and high degree of Internet and telephony competition (2)), the most dirigiste - is Bulgaria (0.368; high VAT on e-services (20%) and the minimum degree of Internet and

telephony competition 1.33)). Countries are distributed equally on both sides of the relative center (0.221) - 16 countries to the left, 16 countries to the right.

## 5. Results and Discussions

### 5.1. The PSFi, the number of international outbound letter mail services and the number of domestic letter mail services

Post is one of the means of disseminating information, and the establishment of high VAT rates on postal services and stamps (since it increases the cost of services) may impact negatively on such indicators of information services sector development, like the number of information services provided by postal offices (services on sending letters, books, newspapers and other printed documents) and the turnover from the provision of these services.

Let us determine, whether with the increase of government's intervention degree in the information services provision process via post, the number of international outbound letter (addressed letters, postcards, newspapers, periodicals, etc. (European Commission, 2014)) mail services, per inhabitant (European Commission, 2018b), and the number of domestic letter mail services, per inhabitant (European Commission, 2018a), decrease.

The analysis of statistical data on 18 European countries allowed to establish that in countries with higher degree of government intervention in the information services provision process via post, the number of international outbound letter mail services per inhabitant not less, in most cases even higher than in countries with more liberal process. For example, in dirigiste on the PSFi

Table 1:  
**PSFi, 32 countries (from liberal to dirigiste), 2018**

| Countries      | PSFi  | Countries      | PSFi  |
|----------------|-------|----------------|-------|
| Malta          | 0.180 | United Kingdom | 0.300 |
| Estonia        | 0.200 | Russia         | 0.300 |
| Slovakia       | 0.200 | Azerbaijan     | 0.360 |
| Czech Republic | 0.210 | Georgia        | 0.360 |
| Spain          | 0.210 | Germany        | 0.380 |
| Latvia         | 0.210 | Cyprus         | 0.380 |
| Lithuania      | 0.210 | Romania        | 0.380 |
| Ireland        | 0.230 | Bulgaria       | 0.400 |
| Poland         | 0.230 | France         | 0.400 |
| Greece         | 0.240 | Armenia        | 0.400 |
| Finland        | 0.240 | Belgium        | 0.420 |
| Italy          | 0.242 | Netherlands    | 0.420 |
| Croatia        | 0.250 | Slovenia       | 0.440 |
| Hungary        | 0.270 | Portugalia     | 0.460 |
| Turkey         | 0.270 | Denmark        | 0.500 |
| Austria        | 0.300 | Sweden         | 0.500 |

Source: Calculated by the author using data presented by European Commission (2020c) and countries' national tax codes

Table 2:  
**ESFi, 32 countries (from liberal to dirigiste), 2018**

| Countries   | ESFi  | Countries      | ESFi  |
|-------------|-------|----------------|-------|
| France      | 0.092 | Ireland        | 0.230 |
| Malta       | 0.115 | Poland         | 0.230 |
| Turkey      | 0.130 | Portugalia     | 0.230 |
| Italy       | 0.166 | Slovakia       | 0.230 |
| Georgia     | 0.180 | United Kingdom | 0.230 |
| Germany     | 0.190 | Finland        | 0.240 |
| Romania     | 0.190 | Czech Republic | 0.243 |
| Hungary     | 0.193 | Azerbaijan     | 0.248 |
| Estonia     | 0.200 | Croatia        | 0.250 |
| Austria     | 0.200 | Sweden         | 0.250 |
| Armenia     | 0.200 | Cyprus         | 0.263 |
| Belgium     | 0.210 | Latvia         | 0.273 |
| Spain       | 0.210 | Denmark        | 0.280 |
| Lithuania   | 0.210 | Russia         | 0.292 |
| Netherlands | 0.210 | Greece         | 0.293 |
| Slovenia    | 0.220 | Bulgaria       | 0.368 |

Source: Calculated by the author using data presented by the World Economic Forum (2016), European Commission (2020a) and countries' national tax codes

Austria, Germany, and in the most dirigiste on the PSFi Sweden (0.300, 0.380 and 0.500, respectively), the number of international outbound letter mail services per inhabitant is, respectively, 5.6, 5.6 and 6.1 (maximum indicator). While in more liberal on the Sub-index countries, for example, in the Czech Republic (0.210), Latvia (0.210), Italy (0.242), Croatia (0.250) - respectively 2.0, 2.1, 0.8 and 0.9. At the same time, the minimum number of provided services is observed in dirigiste on the Sub-index Bulgaria (0.6 and 0.400, respectively).

Similar results were also obtained during the study of whether in European countries with an increase of government intervention in the information services provision process via post (with settling a high VAT on postal services and stamps), the number of domestic letter mail services per inhabitant decreases. In most cases, in more dirigiste on the Sub-index countries, the number of domestic letter mail services per inhabitant is higher (United Kingdom (0.300 and 153.3, respectively), Austria (0.300 and 166.3, respectively), Germany (0.380 and 179.8, respectively), Belgium (0.420 and 160.6, respectively) etc.) than in countries with more liberal postal services (Malta (0.180 and 59.7, respectively), Czech Republic (0.210 and 40.2, respectively), Poland (0.230 and 38.1, respectively), Greece (0.240 and 22.7, respectively), Italy (0.242 and 50.0, respectively), etc.). At the same time, the maximum number of domestic letter mail services per inhabitant is observed in moderate-liberal (moderate-dirigiste) Finland (287.0 and 0.240, respectively), the minimum - in dirigiste Bulgaria (3.7 and 0.400, respectively).

The reason for the higher indicators of the number of international outbound letter mail services per inhabitant in European countries (in most of them) with higher PSFi compared with countries with more liberal postal services, could be that in the studied group of countries more dirigiste on the Sub-index countries are those with higher level of economic development (where the PSFi varies from 0 to 0.230, the average GDP per capita is int. USD 36486; from 0.231 to 0.300 - int. USD 37944; from 0.301 and higher - int. USD 41634), and an increase in the cost of postal services as the result of the increase of VAT on them, on stamps, don't decrease their consumption. The same can be said about the reasons of the higher indicator of the number of domestic letter mail services per inhabitant in countries (most countries) with higher PSFi, compared with countries with more liberal postal services: in the studied group of countries (21 countries) where the PSFi varies from 0 to 0.230, the average GDP per capita is int. USD 37131; from 0.231 to 0.300 - int. USD 40877; from 0.301 and higher - int. USD 41390 (The World Bank, 2018a).

## 5.2. The PSFi and the turnover from the provision of domestic letter mail services

The other development indicator of the information services sector is the turnover from the provision of domestic letter mail services, per 100 people (indicator of «turnover»). Let us determine how this indicator changes depending on the PSFi - the degree of liberalism (dirigisme) of postal services (of the information services provision process via post). In the methodology of the calculation of turnover from the provision of domestic letter mail services (European Commission, 2018c) it is noted that under the term «letters» addressed letters, postcards, newspapers, periodicals, etc. are meant (European Commission, 2014).

Table 3 presents the results of our study conducted in European countries in order to reveal how the average indicator of «turnover» changes depending on changes of the PSFi intervals.

As Table 3 shows, the higher average indicator of turnover from the provision of domestic letter mail services per 100 people is observed in countries where the PSFi intervals are higher, that is, in countries with higher degree of dirigisme of postal services, and vice versa, in countries, where the PSFi intervals are lower (postal services are more liberal), the average indicator of «turnover» is lower.

Table 3:

### Changes in the average indicator of turnover from the provision of domestic letter mail services per 100 people (in EUR) depending on changes of the PSFi intervals for 17 European countries

| The PSFi intervals                        | The average indicator of turnover from the provision of domestic letter mail services per 100 people, EUR |
|---|---|
| 0.180 - 0.230 (first group of countries)  | 2 894   |
| 0.231 - 0.300 (second group of countries) | 5 322   |
| 0.301 - 0.500 (third group of countries)  | 9 435   |

Source: Calculated by the author based on the data received by the author and data from European Commission (European Commission, 2018c) and the World Bank (The World Bank, 2018b)

In most countries of the first and the second group, according to the PSFi intervals (in 10 countries from 12), there is no VAT on postal services, that is, the VAT on postal services Index is 0. These countries are: Malta, Slovakia, and the Czech Republic, Lithuania, Poland, Italy and others. The minimum indicator of turnover from the provision of domestic letter mail services per 100 people, among all studied countries, is observed in Greece (EUR 1748), where there is also no VAT on postal services (PSFi = 0.240); the maximum indicator is observed in Austria (EUR 12747; PSFi = 0.300). Along with it, there are countries with a relatively high degree of government intervention in the information services provision process via post, but a relatively small turnover from the provision of domestic letter mail services per 100 people - United Kingdom (0.300 and EUR 6544, respectively) and Portugal (0.460 and EUR 4618, respectively).

As you can see, in European countries an increase of postal services' dirigisme degree doesn't cause a decrease in the turnover from the provision of domestic letter mail services. On the contrary, in most countries with a higher degree of government intervention in the information services provision process via post, the turnover from the provision of domestic letter mail services per 100 people is higher than in countries with less dirigiste postal services. This can also be due to the fact, that also in this studied group of countries, countries with a higher degree of government intervention in the information services provision process via post, are of a higher level of economic development: with the PSFi varying from 0.180 to 0.230, the average GDP per capita is int. USD 37443; from 0.231 to 0.300 - int. USD 39432; from 0.301 to 0.500 - int. USD 48248 (The World Bank, 2018a).

Let us consider the post offices' activity indicators for information services provision and indicators of the postal services' liberalism (dirigisme) degree in Azerbaijan and some other Commonwealth of Independent States (CIS) countries (the relevant data of which are available). (Table 4)

In general, in moderate-liberal (moderate-dirigiste) on the postal services freedom Sub-index Azerbaijan and Russia, the number of newspapers and magazines sent via post is less than the average indicator for the CIS countries (55.2 million units). At the same time, the maximum number of sent letters and telegrams (among the CIS countries) is observed in Russia. In Azerbaijan, both indicators are lower than relevant average indicators for the CIS countries (lower than 207.1 million units and 1.3 million units, respectively). In dirigiste on the postal services freedom Sub-index Armenia there is no data on the number of newspapers and magazines sent via post. The number of sent telegrams is insignificant, and the number of letters sent via post is much less than the average indicator for the CIS countries (207.1 million units). (The State Statistical Committee of the Republic of Azerbaijan, 2019)

If we calculate the number of letters sent by post (both, international outbound and domestically) per inhabitant, in Russia this indicator will be 9.6, in Azerbaijan - 0.7, in Armenia - 3.7. (The State Statistical Committee of the Republic of Azerbaijan, 2019; The World Bank, 2018b) As you can see, the indicators are quiet low.

In general, it can be confidently said that the CIS countries are fall far short to European countries in the development level of information services sector, and an increased degree of government intervention in the information services provision process via post there, to some extent, may hinder its further development.

Table 4:  
**Postal services for sending newspapers, magazines, letters and telegrams (million units) and the degree of government intervention in the information services provision process via post in the CIS countries, 2018**

|                      | <b>Newspapers and magazines</b> | <b>Letters</b> | <b>Telegrams</b> | <b>PSFi</b> | <b>VAT on postal stamps Index</b> | <b>VAT on postal services Index</b> |
|----------------------|---------------------------------|----------------|------------------|-------------|-----------------------------------|-------------------------------------|
| Azerbaijan           | 1.4                             | 6.5            | 0.2              | 0.360       | 0.300                             | 0.300                               |
| Russia               | 0.6                             | 1382.2         | 6.6              | 0.300       | 0.200                             | 0.400                               |
| Armenia              | -                               | 11.0           | 0.01             | 0.400       | 0.400                             | 0.400                               |
| Belarus              | 201.6                           | 214.5          | 0.3              | -           | -                                 | -                                   |
| Kazakhstan           | 135.6                           | 43.4           | 1.4              | -           | -                                 | -                                   |
| Kyrgyzstan           | -                               | 2.0            | -                | -           | -                                 | -                                   |
| Moldova              | -                               | 42.3           | 0.2              | -           | -                                 | -                                   |
| Uzbekistan           | 20.0                            | 14.7           | -                | -           | -                                 | -                                   |
| Tajikistan           | 26.6                            | 0.2            | -                | -           | -                                 | -                                   |
| Turkmenistan         | -                               | -              | -                | -           | -                                 | -                                   |
| Ukraine (as of 2017) | 0.5                             | 354.5          | 0.2              | -           | -                                 | -                                   |

Source: Calculated by the author based on the data received by the author and from the State Statistical Committee of the Republic of Azerbaijan (2019)



### 5.3. The ESFi and the share of books, magazines, and e-learning material buyers via Internet in the total number of citizens

It can be assumed that a decrease of VAT on e-services, removing in the regulatory framework restrictions which limit the number of licensees in the field of Internet and telephony, may impact positively on the number of people consuming information services via Internet. To confirm this assumption, we will use the indicator of the share of books, magazines and e-learning material buyers via Internet in the total number of citizens (nationals) and the ESFi with its indices. Due to the lack of indicators of the CIS countries, only European countries will be investigated.

The analysis of the impact of e-services' liberalism (dirigisme) degree on the share of books, magazines and e-learning material buyers via Internet in nationals, showed that in order to increase the share of buyers of these type of online-goods in total number of citizens, it is necessary to increase the e-services' liberalism degree ( $R = -0.302$ ). Conducting the regression analysis between the indices of the ESFi and the indicator, has revealed the fact that the Internet and telephony competition Index reflecting existence in the regulatory framework of restrictions which limit the number of licensees in the field of Internet and telephony, affects the share of buyers of these type of online-goods in nationals (Table 5).

In countries, where the Internet and telephony competition Index ranges from 0 to 0.49, the average indicator of the share of books, newspapers and e-learning material buyers via Internet in nationals is 21%; in countries, where the indicator reflecting existence in the regulatory framework of restrictions which limit the number of licensees in the field of Internet and telephony varies from 0.50 to 0.100 - 13%; and in countries with the Internet and telephony competition Index above 0.100 - 4.5%. The maximum share of books, newspapers and e-learning material buyers via Internet in nationals - 40% - is observed in Netherlands and Sweden, where in the regulatory framework there are no restrictions limiting the number of licensees in the field of Internet and telephony, while the minimum - is observed in the most dirigiste (with the highest degree of government intervention), both, on the Internet and telephony competition Index (0.335), and the e-services freedom Sub-index (0.368) Bulgaria - 2%. Along with this, there are countries where there are no restrictions limiting the number of licensees in the field of Internet and telephony (the Internet and telephony competition Index is equal to 0), while the share of books, newspapers and e-learning material buyers via Internet in nationals is low (Romania (0 and 2%, respectively), Slovenia (0 and 7%, respectively), Lithuania (0 and 8%, respectively) and others). There are also countries with certain restrictions in the field of Internet and telephony, but, at the same time, relatively high indicator of the share of books, newspapers and e-learning material buyers via Internet in nationals, namely: Italy (0.050 and 11%, respectively), Slovakia (0.060 and 12%, respectively), and Hungary (0.065 and 12%, respectively).

Thus, a higher degree of Internet and telephony competition in the European countries can increase the share of above mentioned goods buyers via Internet in the total number of citizens (perhaps, the absence in the regulatory framework of restrictions which limit the number of licensees in the field of Internet and telephony, creation of favorable conditions for entrepreneurs, by stimulating competition, reduces the cost of e-services, which leads to an increase in the number of people making these purchases). However, the example of Romania, Slovenia, Lithuania, Italy, Slovakia and Hungary indicates that there are also other factors (for example, the economic development level of the country, the development of the ICT sector, and other factors) influencing on the share of books, magazines, and e-learning material buyers via Internet in the total number of citizens.

## 6. Conclusions

The use of the postal and e-services freedom Sub-indices allowed measuring the degree of government intervention in the information services provision process via post and Internet. Defining

Table 5:

**Regression analysis between the share of books, magazines, and e-learning material buyers via Internet in the total number of citizens and the indices of the ESFi in a group of studied European countries**

|                        | Internet and telephony competition Index | VAT on e-services Index |
|------------------------|--|-------------------------|
| R                      | 0.509                                    | 0.084                   |
| R - squared            | 0.259                                    | 0.007                   |
| F-significance         | 0.011113484                              | 0.696647834             |
| Number of observations | 24                                       | 24                      |

Source: Calculated by the author based on the data received by the author and from Eurostat (2018)

the liberalism (dirigisme) degree of postal services and e-services, the analysis of changes in the development indicators of the information services sector depending on this degree, can be useful in forming strategic priorities for the development of the sector, and in working out the government programs for its development. Hence, the analysis of the relationship between the degree of government intervention in the information services provision process via post and Internet and the development indicators of the information services sector led to the following conclusions:

1. An increase in European countries of the degree of government intervention in the information services provision process via post, does not lead to a reduction in the number of international outbound letter mail services and domestic letter mail services, per inhabitant. Moreover, in most countries (except some of them) with more dirigiste information services provision process via post, the indicators of the number of provided letter mail services are higher than in countries with lower degree of government intervention in this process.
2. The absence of negative impact of the increase in European countries of dirigisme degree of the information services provision process via post on the information services sector's development, is also proved by the fact that an increase of the postal services freedom Sub-index (VAT on postal services and stamps) does not lead to a decrease of the turnover from the provision of domestic letter mail services. On the contrary, in most countries (but there are some exceptions) with an increased degree of government intervention in this process, the turnover from the provision of domestic letter mail services, per 100 people, is greater than in countries, where the process is more liberal. Despite the fact that in European countries with an increase of the degree of government intervention in postal services, the indicators of the post offices' activity for the provision of information services do not decrease, moreover, in most countries with more dirigiste postal services the indicators are even higher (perhaps, this is due to a more developed information services sector and a higher solvency of the population of these countries), however, in the CIS countries, in order to develop the information services sector, postal services should be more liberal.
3. The abolition in European countries of the restrictions in the regulatory framework which limit the number of licensees in the field of Internet and telephony, can increase the share of books, magazines and e-learning material buyers via Internet in the total number of citizens (taking into consideration other factors influencing the indicator, for example, the economic development level of the country, the development level of the ICT sector and others).

As it is seen, the results obtained allow us to give certain recommendations to the CIS countries. First of all, the governments of these countries (taking into consideration the lower solvency of the population and rather low indicators of the information services provision in these countries in compare with more developed countries) need to ensure the liberalism of postal services (to decrease VAT rate on postal services and stamps), so that the information services provision via post offices become more profitable. The analysis of the relevant data for European countries (despite the fact that this kind of a study on the CIS countries was not conducted) let us consider that ensuring also in these countries of absolute competition in the field of Internet and telephony, namely, removing in the regulatory framework restrictions which limit the number of licensees in the field of Internet and telephony, can contribute to an increase in the consumption (provision) of electronic information services (taking into consideration the other influencing factors).

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