

# Attitudes of European Consumers towards Digital Shadow Economy: Lithuanian and Spanish Cases

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*Abstract: The article is aimed at complementation of the theory of shadow economy with consumers' attitudes towards the concept, determinants and channels of digital shadow economy at the international level. The results of the empirical research have enabled to define the phenomenon of digital shadow economy leaning on evaluations of the consumers from two different states, identify the main determinants of consumers' participation in digital shadow economy, and disclose the channels that are commonly employed for acquisition of goods/services from digital shadow markets. Although the states, which were selected for the research, differ by their geographical location, size and population's mentality, the results lead to the conclusion that consumers from both of them have a clear perception of the phenomenon of digital shadow economy, and are able to point out the main factors that motivate their participation in it. The research has also disclosed the lack of consumers' tax morale in both of the states.*

*Keywords: digital shadow economy; consumers; Lithuania; Spain; features of digital shadow economy; concepts of digital shadow economy*

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## 1 Introduction

Globalisation and digitalisation have dramatically changed the ways of how people work, communicate, and even make their purchase decisions. All across Europe, consumers widely use modern communication technologies for their daily activities. With reference to the report of the global management consulting firm *AT Kearney* (2013), more than 6 out of 10 mobile phone users own smart phones that provide connectivity to any website anytime, anywhere. High degree of mobility as well as availability of the Internet connection and a wide variety of products and services traded online promote a rapid spread of so-called “digital consumption”. A today's consumer may visit several websites of retailers,

compare the prices, and then make an online purchase by his/her smart phone or home computer.

With the access to a huge number of potential suppliers, modern consumers demand for convenience and low prices across the purchase channels. However, they rarely care about a supplier's license to provide particular goods or services, and occasionally have their purchases properly documented. In other cases, consumers' choice to make a purchase from an unknown agent in an online forum or a social network is deliberate, mainly driven by an offer of a lower price. The examples above show that although the issues of shadow economy and digital shadow economy are basically analysed from a supplier's position (i.e. suppliers are considered the main agents of shadow economy and digital shadow economy since they provide goods and services for shadow and digital shadow markets, and deliberately conceal their income from public authorities), the role of consumers cannot be underestimated because consumers are the agents that generate the demand – an engine of any economic activity.

Thus far, the studies on consumers' participation in digital shadow economy mainly covered the research of e-fraud (Blackledge, Coyle 2010; Akintoye, Araoye 2011; Vlachos *et al.* 2011, etc.), digital piracy (Williams *et al.* 2010; Ho, Weinberg 2011; Belleflamme, Peitz 2010; Camarero *et al.* 2014; Yu *et al.* 2015, etc.), and the determinants of consumer's involvement in illegal activities online (Shang *et al.* 2008; Higgins *et al.* 2008; Williams *et al.* 2010, Yu *et al.* 2015, etc.). However, consumers' attitudes towards the phenomenon of digital shadow economy, including its concept, determinants, channels, and types of goods/services acquired by these channels, have hardly been analysed in complex. Minding the role of consumers as generators of demand in digital shadow markets, the research of this type would allow to complement the theories of shadow economy and digital shadow economy with new data, and in the future could contribute to the improvement of the measures of shadow economy estimation and prevention.

**The purpose** of this article is to research consumers' attitudes towards the concept and features of digital shadow economy in Lithuania and Spain, and conduct a comparative analysis of the results. Thereby, complementing the theory of shadow economy with new findings of the empirical study.

For the fulfillment of the defined aim, the following **objectives** have been raised: 1) to review the theoretical concepts and interpretations of digital shadow economy; 2) to review the literature on the features of digital shadow economy, including its determinants and channels; 3) to select and present the methodology of the research; 4) to introduce and compare the results of the empirical research on Lithuanian and Spanish consumers' attitude towards digital shadow economy.

**The methods** of the research include systematic and comparative analysis of the scientific literature, snowball data sampling method, consumer survey, Pearson correlation and multiple regression analysis.

## 2 What is Digital Shadow Economy?

As it was noted by Holz *et al.* (2009), a rapid advance of IT conditions a relatively complicated and perplexing understanding of digital shadow economy. The definition of digital shadow economy can be derived from the concept of traditional shadow economy. In the scientific literature, shadow economy is known by a multitude of names such as „non-observed economy“, “informal economy”, “undeclared economy”, “black economy”, “underground economy”, “hidden economy”, “cash-in-hand economy” and others (Barros 2005; Williams 2006; Feige, Urban 2008; Herley, Florencio 2010; Dion 2011; Feige 2012; Schneider *et al.* 2015, etc.). Nevertheless, despite the variety of the terms, there is a strong consensus on how to understand the phenomenon of shadow economy in its broad sense. Shadow economy refers to all legal production and provision of goods and services that are deliberately concealed from public authorities to avoid payment of taxes, social security contributions, or to escape compliance with particular legal standards (e.g. minimum wages, minimum and maximum working hours, vacation benefits, etc.) and administrative procedures (e.g. business registration, establishment of labour contracts, etc.) (European Commission 2005; Schneider, Buehn 2013; Schneider *et al.* 2015).

Leaning on this general definition of traditional shadow economy, and minding the fact that digital activities are the activities performed exceptionally in electronic space (in other words, e-space or digital space) (Holz *et al.* 2009; Herley, Florencio 2010; Yip *et al.* 2012; Feige 2012; Gaertner, Wenig 2012, etc.), it can be proposed that digital shadow economy in general refers to all legal production and provision of goods and services online, when the agents deliberately conceal their activities from public authorities to avoid tax payment or to bypass particular legal standards and/or administrative procedures.

Scientific literature contains a variety of definitions that stress different aspects of digital shadow economy. Some authors are inclined to reveal the underlying nature of digital shadow economy by interpreting it as an unregistered (hidden) profit-driven operation online (Moore *et al.* 2009; Herley, Florencio 2010; Yip *et al.* 2012, etc.), while others highlight online agents' strive to bypass established business standards and regulations (Schneider, Buehn 2013; Arango, Baldwin-Edwards 2014; Schneider *et al.* 2015, etc.) or avoid payment of taxes and/or social security contributions (Feige 2007; Feige 2012; Gaertner, Wenig 2012; Schneider, Buehn 2013, etc.) rather than concentrate on purely economic benefits (cash flows, revenue, profit). The term “digital unrecorded economy” refers to a deliberate concealment of online operations in the sense that neither operations themselves nor their results are properly captured in business accounting documents and/or reports (Karanfil 2008; Feige, Urban 2008). Finally, digital shadow consumption can be interpreted as one of the forms of cybercrime, in particular concerning e-fraud (i.e. consumers' activities of obtaining money illegally using the Internet (Vlachos *et al.* 2011; Amasiatu, Shah 2014; McMillan

*Dictionary* 2015, etc.), digital piracy (i.e. an illegal or unauthorized copying/downloading of particular copyrighted content (Castro *et al.* 2009; Camarero *et al.* 2014, etc.) or dysfunctional consumer behaviour online (i.e. consumers' actions on the Internet that violate the generally accepted norms of conduct in trade (Reynolds, Haris 2009; Harris, Daunt 2013). Although the majority of authors (Williams 2006; Feige 2012; Gaertner, Wenig 2012; Schneider, Buehn 2013; Schneider *et al.* 2015, etc.) are inclined to distinguish between digital shadow economy and cybercrime since the latter is a criminal offence rather than a type of economic activity, it is purposeful to find out whether the same attitudes are shared by consumers.

Hence, the analysis of the scientific literature has enabled to identify the following main characteristics of digital shadow economy that are considered while formulating theoretical definitions of this phenomenon:

- Digital shadow economy is a profit-driven online trade or service provision;
- Digital shadow economy is a global network of e-crimes;
- Digital shadow economy is provision of particular commodities or services in a remote space without any formal registration or appropriate capture of operations and their results in accounting documents or reports;
- Digital shadow economy is an illegal operation online that generates money flows for traders/service providers;
- Digital shadow economy is a trade or service provision in e-space without paying taxes to the state budget.

Since the aim of this article is to find out European consumers' attitudes towards the phenomenon of digital shadow economy, it is purposeful to research how European consumers perceive digital shadow economy. Additionally, whether they distinguish between the concepts of digital shadow economy and criminal activities in e-space (cybercrime). For this purpose, considering the above-mentioned characteristics of digital shadow economy, the following definitions of digital shadow economy were developed:

- Digital shadow economy is a part of shadow economy, when illegal profit-driven online trade or service provision is performed. The activities of digital shadow economy have the trend to be of repeated or non-repeated nature with or without changing IP addresses/computer networks;
- Digital shadow economy refers to global networks emerging in closed Internet forums and promoting chains of e-crimes, including bank attacks, payment card crimes, identity steals and other Internet intrusions;
- Digital shadow economy refers to (un)interrupted, financial gain driven provision of particular commodities or services in the remote space, performed without activity registration and causing damage to an officially registered subject, who provides similar commodities or services;
- Digital shadow economy is an illegal operation in the Internet space, which generates illegal money flows for commodity/service providers or

- purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared;
- Digital shadow economy refers to the trade in e-space, performed without paying any taxes to the state budget, excluding purely criminal activities such as drug trafficking, prostitution).

The proposed definitions of digital shadow economy were presented for evaluation of Lithuanian and Spanish consumers in order to clarify their perceptions of the researched phenomenon.

### 3 The Features of Digital Shadow Economy

While analysing the features of digital shadow economy, it is purposeful to find out which motives drive the agents to get involved in digital shadow markets, and identify the basic channels through which goods and services from digital shadow markets are delivered to consumers. Scientific literature contains a large number of studies to research the determinants of agents' participation in shadow activities online, and the results of these studies show that individuals can be driven by different motives, starting from the general economic situation in their countries, and ending with particular personal (or ego) characteristics.

Economic determinants (i.e. lack of attractive forms of legal activities, unfavourable economic situation in a country, economic opportunities, low costs of data storage online, cost reduction and development of financial innovations) are considered to be the most important determinants of agents' participation in digital shadow economy (Williams *et al.* 2010; Schneider *et al.* 2010; Putninš, Sauka 2014; Lithuanian Free Market Institute (LFMI) 2014, etc.). Accessibility of attractive economic activities (LFMI 2014), reduction of unemployment rate (Williams *et al.* 2010; LFMI 2014), increased wages (Schneider *et al.* 2010; Putninš, Sauka 2014; LFMI 2014), and other similar factors of economic welfare in a country contribute to the growth of personal income (Williams *et al.* 2010; LFMI 2014) and make legal activities more attractive than illegal ones. Hence, favourable economic conditions in a country serve as a favourable environment for legal commerce. What is more, increased economic opportunities (e.g. an ability of a person to own a computer or a smart phone) as well as low costs of digital data storage serve as extra motives to get involved in digital activities (Ho, Weinberg 2011; Sirkeci, Magnusdottir 2011). The attractiveness of e-commerce is even further increased by lower prices of products and services online (Ho, Weinberg 2011; Williams *et al.* 2010; Yu *et al.* 2015). The development of financial innovations (e.g. access to fast credits online or via smart phones) also have a significant impact on consumers' purchase habits since they are always sure to get extra funding for spontaneous shopping (Šukytė 2010).

Low-level of consumers' tax morale (arising from the low-level of the general tax morale in society) alongside stereotypical negative society's opinion about public authorities (citizens, especially in developing countries, often consider a country's government and public institutions under supervision of the government to be an evil pumping out their hard-earned money) make digital activities online look justifiable, and consumers do not mind making purchases without the requirement of any confirmation documents. According to Williams (2014), and Williams and Horodnic (2015), low tax morale alongside with low-level of public self-consciousness are important determinants of social acceptability of any shadow activities, including the ones online.

In the group of legal determinants, weak legal framework of e-commerce regulation, and poor regulation of the IT sector to the minimum reduce the fear that any unreported operation online can be detected, and punishments for unreported activities can be imposed (Waterman *et al.* 2007; Ho, Weinberg 2011). Apart from disadvantages of a legal framework itself, the problems with appropriately trained staff are also extremely topical. Law enforcement institutions feel the lack of officials with the skills to detect shadow activities online, which reduces the risk of being caught even further (Waterman *et al.* 2007; Ho, Weinberg 2011; Bossler, Holt 2012).

Finally, consumers' inclination to acquire products/services in digital shadow markets is determined by the advantages of the IT age (e.g. variety of available products and services, easy and convenient access to information, electronic communication with a product seller or service supplier, sales promotions, convenient return policies, convenience of an acquisition channel, short payment terms, and customer maintenance promote digital shadow consumption) (Mikalajūnas, Pabedinskaitė 2010; Šukytė 2010; Sirkeci, Manusdottir 2011; Ho, Weinberg 2011), lack/absence of a particular product or service in the local market (which is typical of smaller-town markets), and an opportunity to save time which would have been spent going to a traditional shop (Šukytė 2010; Hafezieh *et al.* 2011; Levi, Williams 2013, etc.). More specifically, some scientific studies found that participation in e-commerce generates higher customers' satisfaction by providing quicker service, demand for less effort to buy a product or service, and lower business cost compared to a business run without the use of information technology (IT) (McLeod, Schell 2001). Also, as it was noted by Laudon and Laudon (2000), suppliers in e-commerce deal with advanced technical facilities to run their business smoothly, which very much appeals to potential consumers.

After identification of the main theoretical determinants of consumers' involvement in digital shadow economy, it is important to have more information about the channels through which goods and services from digital shadow markets are delivered to consumers. The analysis of the scientific literature (Hafezieh *et al.* 2011; Levi, Williams 2013; Amasiatu, Shah 2014; Vlachos *et al.* 2011; Dion 2011; Smith 2015, etc.) has disclosed, despite the category of a customer (i.e. a

natural entity, legal entity, multinational enterprise or business network), the channels employed for acquisition of goods/services from digital space are similar (see Table 1).

Table 1

The channels of digital shadow economy employed by different categories of consumers

Category of a consumer	Channels of digital shadow economy
Natural entities	Internet network, online forums, platforms for anonymous operation, online retail stores, online service provision websites, social networks, e-auction sites
Legal entities	E-advert sites, e-auction sites, platforms for anonymous operation
MNEs	E-advert sites, e-auction sites, platforms for anonymous operation
Business networks	Global networks, Internet network, remote spaces, servers, platforms for anonymous operation

As it can be seen from the information in Table 1, unlike legal entities, MNEs and business networks, natural entities more often employ online forums, online retail stores and social networks (e.g. Facebook, Twitter, etc.) for their purchases in digital markets (Hafezieh *et al.* 2011; Levi, Williams 2013; Amasiatu, Shah 2014), although in some cases they also visit e-advertisement or e-auction sites (e.g. for purchase of secondhand cars or other valuable assets) (Dion 2011; Smith 2015). Legal entities and MNEs give preference to the search of goods/services in e-advert sites, e-auction sites and Internet platforms developed for anonymous operation (it should be noted that legal entities and MNEs commonly act via agents or representatives). Finally, business networks, if we consider them as consumers in e-commerce, also act via agents, but the channels of their interest more often cover remote spaces and Internet servers (Holz *et al.* 2009; Hafezieh *et al.* 2011; Levi, Williams 2013).

Summarising, the determinants of consumers' participation in digital shadow economy fall into the groups of economic, psychological, legal and other factors. Economic determinants mainly cover lack of attractive forms or legal activities, unfavourable economic situation in a country, wider economic opportunities conditioned by higher income of population, low costs of data storage online, cost reduction, and development of financial innovations. Psychological determinants cover low-level of consumers' tax morale, and their stereotypical negative opinion about governmental and public authorities. The impact of legal determinants is observed through the emergence of such motivators as low risk of detection on an illegal behaviour online, weak legal framework of e-commerce regulation, lack of public officials with the skills to detect unreported activities online, and poor regulation of IT sector. The other influential determinants include advantages and conveniences of the IT age, lack/absence of a particular product/service in the local market, and time saving. The channels employed by different categories of consumers for acquisition of goods/services from digital space include online retail shops, social networks and platforms, online trade/service provision

websites, e-advert and e-auction sites. In the empirical part of the research, we will identify the main features of digital shadow economy, including its determinants and channels, from consumers' point of view in Lithuania and Spain.

## 4 The Methodology of the Research

In order to have a deeper insight in the attitudes of European consumers towards the phenomenon of digital shadow economy, two European countries – Lithuania and Spain were selected for the research. With reference to the estimations made by Schneider and Buehn (2016), both Lithuania and Spain are attributed to the category of the states with the scopes of shadow economy that exceed the average of the EU, which currently amounts to 17.6 percent of GDP. In 2016, the scope of shadow economy in Lithuania amounted to 24.9 percent of GDP, while in Spain it composed 17.9 percent of GDP (Schneider, Buehn 2016). The second criterion of selection was a similar level of development of both of the states (as of 2013, GDP in current prices amounted to 24.500 PPS (Purchasing Power Standard per inhabitant) in Spain, and 19.100 PPS in Lithuania (Eurostat 2016). In 2016, the World Bank attributed Lithuania and Spain to the category of the states with high income per capita (The World Bank 2016).

In this research “mixed methods design refers to the use of two (or more) research methods in a single study, when one (ore more) of the methods is not complete in itself” (Morse, Niehaus, 2016). So we define, mixed methods as the incorporation of one or more techniques into a single research study in order to reach the main aim.

In order to fulfill the aim of the research, i.e. to compare and assess consumers' attitudes towards the phenomenon digital shadow economy in Lithuania and Spain, “snowball” data sampling method was selected. This method was employed considering its ability to provide the access to target population groups. Employment of “snowball” data sampling method for surveys of hidden population groups is recommended by Atkinson and Flint (2001). The questionnaire for the survey was composed of three structural parts: the first part was developed to establish demographic characteristics of consumers who operate in digital shadow markets; the second part covered the concepts of digital shadow economy proposed for consumers' evaluation in Likert scale; finally, the third part was developed to establish the determinants of acquisition of goods/services from digital shadow markets, to identify the acquisition channels, and find out what categories of goods/services are most commonly acquired via these channels.

The sample was estimated by engaging the *Internet survey system calculator*, which covers the variables of confidence level (expressed as a percentage and representing how often the true percentage of the population who would pick an



answer lies within the confidence interval), confidence interval (a marginal error), and population (in our case, 66 percent of 3 million people in Lithuania makes 1980000 people). To ensure 5 percent error rate under 95 percent confidence level, 384 respondents needed to be surveyed. However, the real number of the respondents, available for the survey, composed 368 people, which determined a slight increase in the error rate up to 5.11 percent. The research was carried out from August 2015 to October 2016 by employing the tools of e-survey.

The sample of the respondents in Spain was estimated leaning on the following criteria: with reference to the data of Eurostat (2016), population of Spain, aged from 15 to 64, composes 30808.47 people, 79 percent of whom have an access to the Internet; hence, the sample of the research should make 24338.69 people; with survey reliability rate of 95 percent, and survey error rate of 7 percent, it is enough to involve 194 respondents. The survey in Spain was carried out from September to October, 2016. The main condition of inclusion of the respondents in the survey was at least once purchase of a good/service in e-space.

Additionally, in order to establish which determinants had the impact on the scope of shadow economy in Lithuania and Spain over 2005-2015, the methods of Pearson regression analysis and multiple regression analysis were employed.

The collected data was processed with SPSS and Microsoft Excel software.

## **5 The Comparative Analysis of Consumers' Attitudes towards Digital Shadow Economy in Lithuania and Spain**

For comparison of the attitudes of Lithuanian and Spanish consumers towards digital shadow economy, at first it is purposeful to analyse which determinants had impact on the scopes of shadow economy in both states over 2005-2015. In order to substantiate expedience of the assessment of the impact of economic and political determinants on the scopes of shadow economy in Lithuania and Spain, the authors verified whether there exists any correlation between *the Freedom from Corruption Index*, *tax paying (in numbers)*, *profit tax (percent)*, *business start-up costs (percentage from the income per capita)*, *GDP per capita (EUR)*, *exports of goods and services (percentage of GDP)*, *imports of goods and services (percentage of GDP)*, *unemployment rate (percentage of the total labour force)*, *inflation (annual, in consumption prices, percent)*, *crediting of private sector (percentage of GDP)*, *total tax rate (percentage of commercial profits)* and *size of shadow economy in Lithuania and Spain over the period 2005-2015*. The results have been presented in Table 2.

Table 2  
The values of Pearson correlation coefficient

No.	Determinants	Pearson correlation coefficient	
		Lithuania	Spain
X1.	The Freedom from Corruption Index	<b>0.864</b> (p = 0,001)	<b>0.759</b> (p = 0.007)
X2.	Profit tax (percent)	<b>0.795</b> (p = 0.003)	0.223
X3.	Tax paying (numbers)	0.182	<b>-0.826</b> (p = 0.002)
X4.	Total tax rate (percentage of commercial profits)	<b>0.795</b> (p = 0.003)	0.223
X5.	Business start-up costs (percentage of income per capita)	<b>0.884</b> (p = 0.000)	<b>0.605</b> (p = 0.049)
X6.	Exports of goods and services (percentage of GDP)	<b>-0.741</b> (p = 0.009)	<b>-0.629</b> (p = 0.038)
X7.	Imports of goods and services (percentage of GDP)	<b>-0.688</b> (p = 0.019)	-0.104
X8.	Inflation (annual, in consumption prices, percent)	0.466	0.438
X9.	GDP per capita (EUR)	0.142	0.275
X10.	Unemployment rate (percentage of total labour force)	-0.279	-0.556
X11.	Crediting of private sector (percentage of GDP)	0.407	0.111

The results in Table 2 show that statistically significant determinants (i.e. the ones with p lower than 0.05, and coefficient  $r$  higher than 0.6) of the size of shadow economy in Lithuania and Spain over 2005-2015 were as follows: X1 – the Freedom from Corruption Index ( $r = 0.864$ ); X2 – Profit tax, percent ( $r = 0.795$ ); X4 – Total tax rate, percentage of commercial profit ( $r = 0.795$ ); X5 – Business start-up costs, percentage of income per capita ( $r = 0.884$ ); X6 – Exports of goods and services, percentage of GDP ( $r = -0.741$ ); X7 – Imports of goods and services, percentage of GDP ( $r = -0.688$ ).

Further in the research, only the variables with values  $p < 0.05$  were included in the multiple regression model. The following equation was developed:  $Y_{Lithuania} = 22.348 + 0.178 * X1 + 0.259 * X4$ . The value of the standardised Beta coefficient (-0.612) shows that coefficient X1 has a greater impact on variable Y (shadow economy) than coefficient X4.

In Spanish case, the determinants with statistically significant values that have the impact on the size of shadow economy are as follows: X1 – the Freedom from

Corruption Index; X3 – Tax paying, numbers; X5 – Business start-up costs, percentage of income per capita; X6 – Exports of goods and services, percentage of GDP.

The following multiple regression equation was developed:  $Y_{\text{Spain}} = 35.372 - 1.828 * X3$ .

Summarising the mathematical estimations, it can be stated that the size of shadow economy is determined by different factors in Lithuania and Spain: over the period under research, the size of shadow economy in Lithuania was to the greatest extent determined by the Freedom from Corruption Index and total tax rate, while the size of shadow economy in Spain was to the greatest extent determined by tax paying. Nevertheless, taxes (regardless of their expression in numerical values or percentage of commercial profits) had a significant impact on the size of shadow economy in both of the states.

The answers to the questions of the first part of the questionnaire have enabled to specify demographic characteristics of the respondents:

- **By age**, the most active participants of e-commerce in both Lithuania and Spain are young people aged from 16 to 29 (69.8 percent of the total number of Lithuanian respondents, and 95.9 percent of the total number of Spanish respondents). The groups of population aged from 30 to 49 composed 23.4 percent of the total number of the respondents in Lithuania, and 2 percent – in Spain. The rest part (i.e. 2.7 percent) of the respondents in Lithuania belonged to the group of population over 50.
- **By profession**, the largest part of the respondents was composed of students (46.7 percent of all Lithuanian survey participants, and 87.8 percent of all Spanish survey participants). Professionals composed the second significant group of the respondents in Lithuania (18.2. percent of all survey participants), while entrepreneurs – in Spain (6.1 percent of all survey participants). The survey involved 7.6 percent IT professional from Lithuania, and 2 percent – from Spain. The number of employees amounted to 7.9 percent of the total number of the respondents in Lithuania, and 4.1 percent in Spain.
- **By income**, the group of the people with no personal income composed 21.2 percent in Lithuania, and 67.3 percent in Spain. Such distribution of the respondents can be explained minding the fact that a large number - 46.7 percent of the respondents from Lithuania, and 87.8 percent of the respondents from Spain - were students, who do not earn any personal income for living. The largest part (25.5 percent) of Lithuanian respondents were attributed to the group of people whose income reach 501 – 1000 Eur per month, while only 2 percent of Spanish respondents fall into the same group. Distribution of the other respondents by their income was as follows: 8.4 percent of Lithuanian and 10.2 percent of Spanish respondents indicated that their monthly income makes under 100 Eur; 14.1 percent of Lithuanian

and 6.1 percent of Spanish respondents declared earning from 101 to 300 Eur per month; 18.8 percent of Lithuanian and 8.2 percent of Spanish respondents declared earning from 301 to 500 Eur per month; finally, 7.9 percent of the respondents from Lithuania and 6.1 percent of the respondents from Spain indicated that their monthly income is over 1001 Eur.

- **By education**, the largest parts of the respondents in both countries indicated having higher education (i.e. 45.9 percent of Lithuanian and 83.7 percent of Spanish respondents). Slightly smaller parts of the respondents (i.e. 39.4 percent of Lithuanian and 16.3 percent of Spanish respondents) indicated having secondary or vocational education.
- **By gender**, the survey involved 31.3 percent of Lithuanian and 38.8 percent of Spanish male, while the share of female composed 63 and 59.2 percent in Lithuania and Spain respectively.

The value of *Cronbach alpha* coefficient, estimated for the second part of the questionnaire titled “The concept of digital shadow economy,” amounted to 0.6, which proposes that the questions of the survey reflect the target dimension with appropriate accuracy. The marginal value of *Cronbach alpha* coefficient, fixed for this research, is equal to 0.6.

At first, we will analyse how consumers from both states interpret the phenomenon of digital shadow economy. The values of *Kendall's coefficient* of concordance for this group of questions were equal to 0.061 and 0.053 for Lithuania and Spanish respectively, and values p were equal to 0.000, which, in turn, proposes that congruence of the respondents' opinions is weak, but statistically significant (see Table 3).

Table 3

Mean ranks estimated for different concepts of digital shadow economy: attitudes of Lithuanian and Spanish consumers

No.	Proposed concepts of digital shadow economy	Mean ranks (Lithuanian consumers)	Mean ranks (Spanish consumers)
1.	Digital shadow economy is a part of shadow economy, when illegal profit-driven online trade or service provision is performed. The activities of digital shadow economy have the trend to be of repeated or non-repeated nature with or without changing IP	3.48	2.93
2.	Digital shadow economy refers to global networks emerging in closed Internet forums and promoting chains of e-crimes, including bank attacks, payment card crimes, identity thefts and other Internet intrusions	3.19	2.86
3.	Digital shadow economy refers to (un)interrupted, financial gain driven provision of particular	3.78	2.77

	commodities or services in the remote space, performed without activity registration and causing damage to an officially registered subject, who provides similar commodities or services.		
4.	Digital shadow economy is an illegal operation in the Internet space, which generates illegal money flows for commodity/service providers or purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared	3.83	3.31
5.	Digital shadow economy refers to the trade in e-space, performed without paying any taxes to the state budget, excluding purely criminal activities such as drug trafficking, prostitution, etc.	3.53	3.02

For this research, it was established that the proposed concepts of digital shadow economy with mean ranks over 3 should be treated as understandable and acceptable to consumers. The concepts with mean ranks under 2.9 points are considered as poorly reflecting consumers' perception of digital shadow economy.

The data in Table 3 shows that regardless of their citizenship, consumers are inclined to interpret the phenomenon of digital shadow economy as *an illegal operation in the Internet space, which generates illegal money flows for commodity/service providers or purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared* (mean ranks 3.83 and 3.31 for Lithuania and Spain respectively). While evaluating the other concepts of digital shadow economy, the opinions of Lithuanian and Spanish respondents significantly varied. Spanish respondents found the concept proposing that *digital shadow economy refers to the trade in e-space, performed without paying any taxes to the state budget, excluding purely criminal activities such as drug trafficking, prostitution, etc.* comparatively acceptable, while the concepts marked as 1-3 in Table 2 were found poorly reflecting the core of the researched phenomenon.

Unlike Spanish respondents, consumers from Lithuania found all the concepts of digital shadow economy comparatively acceptable (with mean ranks over 3). The concept proposing that digital shadow economy refers to *(un)interrupted, financial gain driven provision of particular commodities or services in the remote space, performed without activity registration and causing damage to an officially registered subject, who provides similar commodities or services* took the second position (with mean rank equal to 3.78) among all other concepts, which were presented for consumers' evaluation.

The systematised results of the empirical research lead to the conclusion that **both Lithuanian and Spanish consumers are inclined to differentiate between cybercrime (drugs, prostitution, steals of credentials, smuggling, etc.) and digital shadow activities, which, by their nature, are unreported economic activities online that violate legal regulations of a state. Performance of**

**unreported activities generates unreported cash flows to illegally acting agents and allows to evade payment of particular taxes.**

The value of *Cronbach alpha* coefficient, estimated for the third part of the questionnaire titled “The features and channels of digital shadow economy”, amounted to 0.823, which proposes that the questions of the survey reflect the target dimension with appropriate accuracy. The values of *Kendall's coefficient* of concordance for this group of questions were equal to 0.133 and 0.093 for Lithuania and Spain respectively, and values *p* were equal to 0.000, which proposes that congruence of the respondents' opinions is weak, but statistically significant. Incongruence of the respondents' opinions can be explained by employing different presumptions: firstly, each respondent leans on his/her personal experience in e-commerce; secondly, the respondents may have different perceptions concerning the phenomenon of digital shadow economy, which thus far has not been universally defined either in scientific or in legal sources; finally, the issue of digital shadow economy remains insufficiently researched, which makes the concept of this phenomenon seem completely new. The determinants of consumers' participation in digital shadow economy and evaluations of the influence of these determinants on consumers' decision to acquire products/services from digital shadow markets have been presented in Table 4.

Table 4

The determinants of consumers' participation in digital shadow economy: comparative analysis of the attitudes of Lithuanian and Spanish consumers

Determinant group/Determinant	Mean rank (Lithuanian consumers)	Mean rank (Spanish consumers)
<i>Economic determinants</i>		
1. The lack of availability of economic activities	3.02	3.02
2. Unfavourable economic situation in the country (high unemployment, low salary)	<b>3.67</b>	<b>3.46</b>
3. Economic potential (internet access, hardware and software quality, reasonable smart phone and computer costs)	<b>3.66</b>	<b>3.02</b>
4. Reasonable digital data storage costs	3.45	3.07
5. Lower price	<b>4.08</b>	<b>3.52</b>
6. Development of financial innovations (availability of short-term credits online)	3.26	3.11
<i>Psychological determinants</i>		
7. Low tax morality level	3.45	3.17
8. Prevailing stereotypical negative opinion about governmental institutions and public authorities	3.38	2.75
<i>Legal determinants</i>		
9. Low possibility of detection of a purchase from legally non-existent entity without paying VAT	3.26	2.95

10. Weak legal framework which could help to control the scopes of cybercrime	3.32	2.71
11. Lack of professionals with the skills to investigate cybercrimes; as a result, agents in digital shadow markets are not afraid to be caught or punished	3.37	2.57
12. Poor regulation and control of the IT sector	3.42	2.67
<i>Other determinants</i>		
13. Advantages of the IT age (convenience of shopping without leaving home at any time, anonymity, etc.)	<b>4.03</b>	<b>3.02</b>
14. Lack/absence of desired goods/services in the local market	<b>3.83</b>	<b>3.34</b>
15. Time saving when purchasing goods/services online	<b>3.95</b>	<b>3.36</b>

The values of mean ranks are interpreted as follows: if a mean rank is over 3.5, it is considered that the factor with this mean rank is a strong motivator for consumers to acquire goods/services from digital shadow markets; if a mean rank falls into the interval from 3.49 to 3.00, the factor with this mean rank is considered less influential; finally, if a mean rank is under 2.99, the factor with this rank is considered unimportant for the decision of a consumer to acquire goods/services from digital shadow markets.

In the group of *economic determinants*, consumers from both states indicated **lower price** as the most influential factor that determines acquisition of goods/services from digital shadow markets (mean rank for Lithuanian consumers was equal to 4.08, and for Spanish consumers – to 3.5 points). **Unfavourable economic situation in the country** (with mean rank equal to 3.67 for Lithuanian consumers, and 3.56 – for Spanish consumers) was acknowledged as the second influential factor. Economic opportunities (e.g. access to the Internet, possession of a PC or a smart phone, low costs of acquisition of technologies, etc.) was pointed out as influential by Lithuanian consumers (mean rank equal to 3.66), while their Spanish counterparts attributed it to the group of less influential factors.

The other determinants, such as *advantages of the IT age* (mean rank equal to 4.03), *lack/absence of a desired good/service in the local market* (mean rank equal to 3.83), and *time saving* (mean rank equal to 3.95) were indicated as influential only by Lithuanian consumers, while Spanish consumers treated them as less influential.

Summarising the results of the survey, the following trends can be observed: a consumer regardless of the country of his/her origin, gives priority to an opportunity to acquire a good/service at a lower price. This determinant is complemented with the unfavourable economic situation in the country (following the statistical data, high-level (20.5 percent) of unemployment has remained one of the most topical problems of Spanish economy in 2016, while Lithuania is facing the problems of wages that are considered among the lowest in the EU (the average wage in Lithuania amounted to 380 Eur in 2016)). The other influential

determinants, such as the advantages of the IT age, time saving, and lack of a desired good/service in the local market, could be attributed to the group of the determinants of e-commerce in general, but consumers indicated them as motivators to acquire goods/services from suppliers operating in digital shadow markets. The remained groups of the proposed determinants of digital shadow economy (i.e. psychological and legal determinants) were indicated as less influential or not influential for acquisition of goods/services from digital shadow markets.

In order to identify the channels, which are most commonly employed by consumers for acquisition of goods/services from e-space, the respondents were asked to indicate and evaluate them (see Fig. 1).

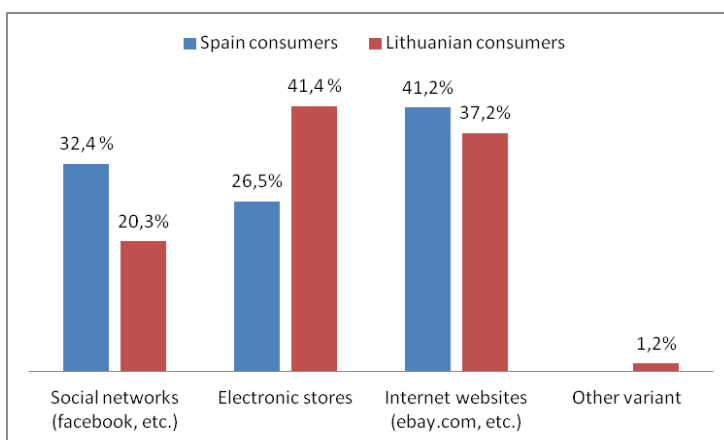


Figure 1

The channels commonly employed for acquisition of goods/services from e-space, percent

Systematisation of the survey results has revealed that Spanish consumers are inclined to acquire goods/services from various Internet websites (as it was indicated by 41.2 percent of Spanish respondents), while Lithuanian consumers prefer electronic stores (as it was pointed out by 41.4 percent of Lithuanian respondents). What is more, consumers from both states admitted acquiring goods/services from social networks. Hence, the results of the survey propose that the above-mentioned channels appeal to both Spanish and Lithuanian consumers, which serves as a strong motive for suppliers to advertise their goods/services in these channels in order to reach a potential consumer. Another interesting fact is that 30.4 percent of Lithuanian, and 20.4 percent of Spanish consumers have never required for any purchase confirmation documents (e.g. invoices, bills, checks, etc.). 37.2 percent of Lithuanian, and 36.7 percent of Spanish respondents not always require for such documents, but the vast majority of the respondents who ask for confirmation a status of an online trader (i.e. 57.7 percent of Lithuanian, and 42.9 percent of Spanish respondents) do this for the following reasons: trying



to escape the risk to acquire a poor quality product/service or following recommendations of friends or acquaintances. Lithuanian consumers more than their Spanish counterparts pay attention to reliability and guarantees of a good/service. The issues of tax morale were not indicated as significant in this respect.

Summarising, the empirical research has disclosed the following consumers' attitudes towards digital shadow economy:

- Both Lithuanian and Spanish consumers interpret the phenomenon of digital shadow economy as *an illegal operation in the Internet space, which generates illegal money flows for commodity/service providers or purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared.*
- The main determinants of digital shadow economy from consumers' point of view are lower price and unfavourable economic conditions. In addition, the advantages of the IT age, lack/absence of a desired good/service in the local market, and time saving serve as extra motivators for Lithuanian consumers to participate in digital shadow economy, while Spanish consumers treat these factors as less influential. Legal and psychological determinants do not have any significant impact on the decision of consumers from both states to acquire goods/services from digital shadow markets.
- Consumers are not inclined to require for any purchase confirmation documents from online suppliers of goods/services (this tendency was confirmed by similar distribution of the answers provided by the respondents from both of the states) or require for such documents only trying to escape the risk to acquire a poor quality product/service, to have more guarantees or following the recommendations of friends or acquaintances. However, the principle of tax morale is not considered.
- The main difference between the habits of Lithuanian and Spanish consumers relevant to their participation in digital shadow economy is selection of the channels for acquisition of goods/services from e-space. The results of the survey have disclosed that Lithuanian consumers prefer electronic stores, while Spanish consumers choose various Internet websites. These findings could be the reason for state tax inspectorates to monitor the activities of the above-mentioned channels of e-commerce with higher accuracy.

## Conclusions

The comparative analysis of Lithuanian and Spanish consumers' attitudes towards the phenomenon of digital shadow economy has enabled to complement the theory of shadow economy with the concept, determinants and channels of digital shadow economy from consumers' position. The results of the research have revealed that consumers from the states with the similar level of economic development interpret the phenomenon of digital shadow economy as an illegal

operation in the Internet space, which generates illegal money flows for commodity/service providers or purchasers, and deprives legal traders/service providers from the revenue that could be officially accounted, calculated and declared. In other words, digital shadow economy is an unregistered commercial operation in electronic space, when unregistered suppliers earn income, but evade payment of taxes to the state budget. Economic determinants (e.g. lower prices of goods/services provided online or unfavourable economic situation in the country) are the main determinants that motivate consumers to acquire goods/services from the Internet, usually without verification of a status of a supplier. The spread of digital shadow economy in European level is not highly determined by psychological (tax morale, negative society's attitudes towards public authorities) or legal factors (e.g. poor regulation of the IT sector, low risk of detection, etc.). Hence, the results of the research propose that in order to reduce consumers' motivation to participate in digital shadow economy, first of all, it would be purposeful to increase consumers' awareness by improving conditions for legal business conduct, reducing unemployment rate, and employing educational measures (since leaning on the results of the survey, consumers hardly consider the issues of tax morale when making purchases from illegal suppliers online; what is more, they occasionally require for any purchase confirmation documents). The future research on this topic could be aimed at clarification which measures would be efficient to discourage consumers from participation in digital shadow economy.

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