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Economic and demographic characteristics of the subjects, operating in digital shadow economy

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Abstract

This article is aimed at theoretical and empirical identification of economic and demographic characteristics of the subjects, operating in digital shadow economy. Although, in general sense, the characteristics of the subjects, operating in digital shadow economy, are not extremely different from the ones of the subjects, operating in traditional shadow economy, the expert evaluation has enabled to identify the distinctive features of an illegal digital market seller, who can be represented as a young or middle-aged male with higher education, a professional in his operational field. With reference to the research results, sellers in digital shadow economy include the entities with officially registered activities, who are trying to evade taxation of the revenues earned from the operations in e-space. On the other hand, according to the experts, the amount of the officially accounted revenue earned by these entities may reach up to 300 EUR. Hence, the defined profile of an illegal seller, as of a subject, operating in digital shadow economy, proposes that a seller in digital shadow economy is an intellectually developed person with advanced professional skills, but insufficient financial earnings.

1. Introduction

As argued by Wall (2005), the empowering of an individual to exploit networked technology to carry out incredibly complex and far-reaching tasks countless times globally is one of the most profound transformations of trade. With an attraction of opportunities, including easy availability, use and control of technologies (Ingram & Hinduja, 2008; Amasiatu & Shah, 2014; Camarero et al., 2014), variety of products and services on sale economy

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(Mikalajunas & Pabedinskaite, 2010; Sirkeci & Magnusdottir, 2011) low price (Mikalajunas & Pabedinskaite, 2010; Ho & Weinberg, 2011; Vida et al., 2012; Yu et al., 2015), time saving (Ho & Weinberg, 2011; Williams et al., 2010; Yu et al., 2015; Amasiatu & Shah, 2014 and others), convenient delivery terms (Vida et al., 2012; Sirkeci & Magnusdottir, 2011) and e-communication with a consumer (Mikalajunas & Pabedinskaite, 2010), more and more product buyers and service providers are entering the e-trade. Nevertheless, difference between corporate and personal, typical of e-environment (Calluzzo & Cante, 2004; Shang et al., 2008; Williams et al., 2010), in combination with the lack of public self-consciousness (Taylor, 2012; Arli et al., 2015; Amasiatu & Shah, 2014) determine subjects' participation not only in formal, but also in digital shadow economy. Although the precise scopes of digital shadow economy have not still been estimated due to the lack of universally acceptable methodologies and difficulties to track all kinds of activities, one recent estimate of global corporate losses stands at around €750 billion per year (*Europol,* 2011).

Consideration of the soaring scopes of digital shadow economy and intensive subjects' participation in it determines the necessity to reduce the volumes of this phenomenon. In order to establish the efficient measures that would enable to reduce the scopes of digital shadow economy with observing individual privacy rights, and at the same time assuring persistence of e-trade, it is purposeful to research characteristics of the subjects, who operate in digital shadow economy. Since product suppliers as well as service providers act responding to the demand for products and services online, they can be considered as significant subjects of digital shadow economy.

The previous scientific studies on the topic of subjects' participation in illegal online trade basically cover the analysis of the factors that push subjects to e-fraud (Blackledge & Coyle, 2010; Akintoye & Araoye, 2011; Yip et al., 2012; Mello, 2013 and others), digital piracy (Higgins, 2007; Belleflamme & Peitz, 2010; Williams et al., 2010; Camarero et al., 2014; Taylor, 2012; Yu et al., 2015 and others) and dysfunctional behaviour online (Hjort & Lantz, 2012; Harris & Daunt, 2013; Amasiatu & Shah, 2014 and others). The authors of this article extend these studies by researching economic and demographic characteristics of the subjects of digital shadow economy.

The aim of this article is to identify economic and demographic characteristics of the sellers, as subjects operating in digital shadow economy. The defined aim was detailed into the following objectives: 1) to analyse the theoretical literature on economic, ego and demographic determinants of subjects' participation in digital shadow economy; 2) to select and present the methodology of the research; 3) to introduce the results of the empirical research on economic and demographic characteristics of the sellers, as subjects operating in digital shadow economy. The methods of the research include scientific literature analysis and expert evaluation.

2. Economic, ego and demographic determinants of subjects' participation in digital shadow economy: theoretical background

In their study of dysfunctional subjects' behaviour online, Hjort and Lantz (2012) note that the differences in subjects' behaviour might result not only from a pure pursuit for cost reduction, but also can be determined by particular personal characteristics, for instance, age, income, education. The impact of ego, or demographic, determinants was as well highlighted by Harris and Daunt (2013), King et al. (2007) in the studies of digital shadow economy participants' misbehaviour online, Amasiatu and Shah (2014) in the study of e-fraud drivers, Sirkeci and Magnusdottir (2011), Williams et al. (2010), Ho and Weinberg (2011) and in the studies of digital piracy drivers, and other researchers. The analysis of the scientific literature has enabled to systematise the economic, ego and demographic determinants of subjects' participation in digital shadow economy (see Table 1).

Table 1. Economic, ego and demographic determinants of subjects' participation in digital shadow economy.

Determinants	Research results	Scientific sources
	ECONOMIC DETERMINANTS	
Gain	Variety of products/services, information, e-communication with a supplier, sales promotions, return policies, convenience of an acquisition channel, short payment terms, and customer maintenance promote digital shadow economy	Fullerton and Punj, 2004; Sukyte, 2010; Sirkeci and Magnusdottir, 2011; Ho and Weinberg, 2011

| Cost reduction | Lower prices of products and services online in comparison to the prices of similar products or services traded in traditional shops promote digital shadow economy | Mikalajunas and Pabedinskaite, 2010; Ho and Weinberg, 2011; Williams et al., 2010; Sandywell, 2010; Foscht et al., 2013 |
| Lack of financial independence of participant's | Financially independent participants are less likely to get involved in digital shadow economy | Piron and Young, 2000; Levin et al., 2007; Amasiatu and Shah, 2014 |

<div align="center">EGO DETERMINANTS</div>

<div align="center">Personal environment</div>

Important people's impact	Friends, family and important people may encourage participation in digital shadow economy	King and Dennis, 2006
Poor or ineffective parenting practices	Lack of parental attention may encourage young people's participation in digital shadow economy	Williams et al., 2010
Lack of monitoring	Lack of parental and institutional monitoring may encourage young people's participation in digital shadow economy	Williams et al., 2010

<div align="center">Personal qualities</div>

Experience	Successful previous experience of ordering goods/services online may promote digital shadow activities	Foscht et al., 2013
Personal image	Particular personal characteristics, e.g. propensities, impulsiveness, low level of self-consciousness, self-esteem needs, etc., may promote digital shadow activities	Piron and Young, 2000; Ho and Weinberg, 2011; Webber and Yip, 2012; Vida et al., 2012; Williams et al., 2010; Taylor, 2012; Higgins et al., 2008
Inclination for revenge	Negative attitude towards larger, impersonal businesses may promote digital shadow activities	Yu et al., 2015; Amasiatu and Shah, 2014

<div align="center">DEMOGRAPHIC DETERMINANTS</div>

Gender	Men have bigger inclination to get involved in digital shadow economy than women	Sirkeci and Magnusdottir, 2011; Amasiatu and Shah, 2014
Age	Younger participants are more inclined to get involved in fraudulent activities online in comparison to middle-aged or older subjects	Harris, 2008; Sirkeci and Magnusdottir, 2011
Marital status	Divorced, widowed and separated subjects are more inclined to get involved in fraudulent online activities in comparison to single and married subjects	Amasiatu and Shah, 2014
Education	Low educated subjects are more inclined to get involved in fraudulent online activities in comparison to higher educated subjects	Sirkeci and Magnusdottir, 2011
Income	Low income subjects are more inclined to get involved in fraudulent activities online in comparison to higher income subjects	Rosenbaum et al., 2011; Sirkeci and Magnusdottir, 2011
Social status	Subjects with low social status are more inclined to get involved in fraudulent activities online in comparison to subjects with higher social status	Hsu and Shiue, 2008

The data, presented in Table 2, illustrates that economic determinants of subjects' participation in digital shadow economy include gain, cost reduction and lack of financial independence. Analysing participants' gain, obtained

purchasing products and services online, Mikalajunas and Pabedinskaite (2010) point out variety of available products and services, easy and convenient access to sufficient amounts of information about a particular product or service, electronic communication with a product seller or service supplier, sales promotions (including e-auctions) and convenient return policies. Sirkeci and Magnusdottir (2011) highlight the impact of convenience of an acquisition channel, which is supported by Ho and Weinberg (2011), hypothesizing that consumers also derive higher utility from delivery immediacy. Participants' gain, emerging in the forms of short payment terms, customer maintenance (e.g., engagement of 24 hours working automatic reply systems), and ability to communicate with other participants, was confirmed by Sukyte (2010) in the study on e-commerce development trends in Lithuania and EU. The determinant of cost reduction stands for both the significant impact of lower prices of products and services online in comparison to the prices of similar products or services traded in traditional shops (Mikalajunas & Pabedinskaite, 2010; Ho & Weinberg, 2011; Williams et al., 2010; Foscht et al., 2013 and others) and time saving (Ho & Weinberg, 2011; Williams et al., 2010; Vida et al., 2012 and others). Lack of participants' financial independence, serving a as determinant of digital shadow consumption, reflects lack of the possessed resources (Levin et al., 2007; Amasiatu & Shah, 2014) as well as inability to satisfy one's personal and/or altruistic needs (Piron & Young, 2000).

Confirmation of the links existing between financial and ego gains and the perpetration of aberrant behaviours can be found in Piron and Young's (2000) study, where the authors report the evidence of involvement in digital shadow activities caused by subjects' inabilities to maintain or project a personal image within their social or professional environment. Analysing the determinants of personal environment in digital piracy, King and Dennis (2006) highlight the impact of important people (e.g., friends, family members, celebrities, etc.), noting that this impact can emerge as an encouragement, pressure or a behaviour model. Important people's successful experience in performing digital black activities may also serve as a driver to participate in digital black markets (King & Dennis, 2006). Researching the motives of digital piracy, Williams et al. (2010) focus on the determinants that originate from digital black market participants' childhood and/or adolescence, i.e. poor or ineffective parenting practices and lack of monitoring. Considering the fact, that young people, aged from 16 to 25, are the most active participants of digital shadow activities (Sukyte, 2010), lack of parental interest in their children's occupations as well as the lack of monitoring are treated as the factors that determine poor children's attachment to other people (Williams et al., 2010) and thus results in involvement in virtual environment, including digital shadow economy.

In the group of personal qualities, scientists basically focus on subjects' experience, personal image and the possible motives of revenge. It is proposed that subjects' successful previous experience of ordering goods/services online (Foscht et al., 2013) as well as their past behaviour in a particular acquisition channel (Ho & Weinberg, 2011; Vida et al., 2012) may push them further into digital activities, including operation on digital shadow markets. Subjects' personal image, i.e., propensities (Webber & Yip, 2012; Williams et al., 2010; Taylor, 2012), (non)impulsiveness (Higgins et al., 2008), low level of self-consciousness (Amasiatu & Shah, 2014) or self-control (Williams et al., 2010), self-esteem needs (Yu et al., 2015; Amasiatu & Shah, 2014), sometimes expressed as aberrant heroism, manifesting in the form of breaking laws and regulations (Yu et al., 2015; Amasiatu & Shah, 2014) or even anomie and cynicism (Yu et al., 2015; Amasiatu & Shah, 2014) may lead to active participation on black economies, especially in digital space with high level of anonymity. In rarer cases, the subjects may be driven by revenge motives, i.e. negative attitudes towards larger, impersonal business (Yu et al., 2015; Amasiatu & Shah, 2014).

In the group of demographic determinants, the scientists approve the impact of gender (Sirkeci & Magnusdottir, 2011; Amasiatu & Shah, 2014), age (Harris, 2008; Sirkeci & Magnusdottir, 2011), marital status (Amasiatu & Shah, 2014), education (Sirkeci & Magnusdottir, 2011), income (Rosenbaum et al., 2011; Sirkeci & Magnusdottir, 2011) and social status (Hsu & Shiue, 2008) on subjects' decision to obtain/sell products/services from digital shadow markets: younger divorced, widowed or separated men with low education, low income and low social recognition (unattractive physical appearance, disrespectable occupation, previous criminal conviction, etc.) are considered to be more inclined to digital shadow activities in comparison to middle-aged, married, educated peoples with medium or high income and socially recognized status.

Summarising, digital shadow economy is determined not only by advancement of IT technologies as a tool for digital transactions, but also by a set of economic, ego and demographic determinants, reflecting its participants' economic-social position, environment and personality. The basic theoretical economic determinants of subject'

participation in digital shadow economy include gain, cost reduction and lack of financial independence; the main ego determinants cover digital shadow economy participants' personal environment factors, such as important people's impact, poor or ineffective parenting practices and low monitoring, and a set of personal qualities; finally, the decision to get involved in digital black markets might be determined by subjects' gender, age, marital status, education, income and social status.

In order to identify the economic, ego and demographic characteristics of sellers, as subjects operating in digital shadow economy, the empirical research was performed. The methodology and results of the research have been introduced in the following sections of this article.

3. The methodology of the empirical research

In many cases, a person (or a group of people), operating illegally, show similar characteristics, considering which detection of a single offender or a group of offenders becomes less complicated. The empirical research is aimed at identification of economic and demographic characteristics of the sellers (product traders and service providers), operating in digital shadow economy. The method of expert evaluation was engaged for the fulfillment of the defined aim.

Expert evaluation is one of the most widely applied insight methods. Since objectives 1-3 are aimed at revelation of experts' attitudes towards the researched phenomenon, questionnaire survey can be considered the most relevant data collection method for this research. Engagement of expert evaluation method was also determined by the lack of initial information on the researched topic.

With reference to Makridakis et al. (1998), the research based on this method, has to involve 10 – 100 experts, considering the primary purpose of the research as well as the competence of the experts in the researched field whereas Augustinaitis et al. (2009) recommend involvement of at least 5 experts to ensure accuracy and reliability of evaluation. The expert evaluation for the research introduced in this article was carried out applying both direct (personal interviews) and indirect (telephone and e-mail interviews) methods of data collection on the basis of the questionnaire prepared in advance. Apart from creativity, attitude towards the expertise, judgement flexibility, reliability, self-criticism, and related qualities, scientific literature (Augustinaitis et al., 2009) emphasises the significance of expert competence. Thus, the survey was focused on expert competence, their long-term experience, acknowledgment with the situation of shadow economy in Lithuania, and the most urgent problems caused by the researched phenomenon rather than on massiveness of the survey. Hereby, following the criterions mentioned above, the expert group for the survey involved 22 people, representing State Tax Inspectorate, the Government of the Republic of Lithuania, the Parliament of the Republic of Lithuanian, Lithuanian Department of Statistics, the Bank of Lithuania, the Customs of Lithuania, The Lithuanian Chamber of Auditors and Lithuanian Free Market Institute.

In their study, Augustinaitis et al. (2009) refer to Libby and Blashfield (1978), who proved that in the modules of aggregated expert evaluations with equal weights, accuracy obtained surveying small expert groups is not lower than that obtained surveying large expert groups. Nevertheless, accuracy of evaluations presented by the group composed of three experts may substantially exceed the accuracy of the evaluations obtained after surveying the group composed of 1 – 2 experts. Further increase of the size of expert group determines a slight rise of evaluation accuracy, which reaches its peak surveying the group composed of 5 - 9 experts. In cases, when the accuracy obtained surveying the group composed of 5 - 9 experts is insufficient, it is purposeful to increase experts' competence rather that group size.

Analysis and interpretation of the research results. The questionnaire was composed of 2 structural parts (the first of which was developed for accumulation of general information about the experts (work experience, operation field/institution) whereas the second included characteristics of the sellers, operating in digital shadow economy, proposed for the experts' evaluation. The experts were asked to evaluate each of the statements in Likert evaluation scale, where rank 1 stands for the lowest (I completely disagree/it is completely insignificant), and rank 5 – for the highest possible evaluation (I completely agree/it is extremely significant). In accordance with the strength of agreement/disagreement with particular statement, intermediate ranks 2, 3 or 4 could be selected.

The results of the research were processed engaging SSPS (Statistical Package for Social Sciences) and Microsoft Excel software.

It should be noted that scientific literature submits different interpretations of *Cronbach alpha* coefficient while presenting the results of the expert evaluation. Some scholars (Nunnally & Bernstein, 1994) note that *Cronbach alpha* coefficient must not be lower than 0.7 whereas others (Malhotra & Birks, 2003) state that the lowest critical value of the reliability of the questionnaire is 0.6. Hence, selection of the lowest value of *Cronbach alpha* coefficient is a subjective issue, and a particular value can be defined considering the nature and qualitative aspects of the target research. For this research, the critical value of 0.6 was established.

4. The results of the empirical research

Processing the information on the competence and work experience of the experts involved in the survey, it has been estimated that 59 per cent of the experts have acquired over fifteen-year experience in their occupation field; 14 per cent of the experts have acquired one-to-four-year experience; finally, 9 per cent of the experts – five-to-to-year experience. The researched involved 50 per cent of the experts representing State Tax Inspectorate (highest level managers from various Lithuanian regions), 14 per cent of the experts representing Lithuanian Department of Statistics, 14 per cent of the experts representing The Lithuanian Chamber of Audit, 5 per cent of the experts representing Lithuanian Free Market Institute, 5 per cent of the experts representing The Chancery of the Parliament of the Republic of Lithuania, and 4 per cent of the experts representing the Government of the Republic of Lithuania.

Leaning on the professional experience, the experts evaluated the proposed economic and demographic characteristics of the sellers, as subjects operating in digital shadow economy (see Table 2). The value of the estimated *Cronbach alpha* coefficient was equal to 0.922, the value of Kendall's coefficient of concordance – equal to 0.402, and value p - equal to 0.000.

Table 2. Mean ranks for the proposed characteristics of the sellers, as subjects of digital shadow economy.

Characteristics of the subjects, operating in digital shadow economy	Mean rank
ECONOMIC CHARACTERISTICS	
Unemployed	3.10
Former business people	3.19
Entities with officially registered activities, evading taxation of the revenues earned from the operations in e-space	**3.81**
People with advanced level of computer literacy	2.54
The amount of the officially accounted revenue:	
• Up to 300 EUR	**3.90**
• From 301 EUR to 500 EUR	3.13
• 501 EUR and higher	2.93
• A professional in one's field	**3.59**
DEMOGRAPHIC CHARACTERISTICS	
People under 18 (teenagers)	3.05
People aged from 18 to 29 (young people)	**4**
People aged from 30 to 49 (middle-aged people)	**3.68**
People aged 50 and over (elderly people)	2.56

Women	3.26
Men	**3.68**
People with IT education	3.05
People with higher education	**3.55**
People with secondary education	3.16
People with primary education	2.11

Characteristics with estimated mean ranks of 3.5 points and higher are considered attributable to the profile of a seller, operating in digital shadow economy whereas characteristics with estimated mean ranks of 3.49 points and lower are considered not attributable to the profile of a seller, operating in digital shadow economy.

The results of the expert evaluation have enabled to identify the following <u>economic characteristics</u> of the sellers, operating in digital shadow economy:

- They include entities with officially registered activities, evading taxation of the revenues earned from the operations in e-space (mean rank 3.81)
- They are professionals in their field (mean rank 3.59)
- The amount of their officially accounted revenue reaches up to 300 EUR (mean rank 3.90).

<u>In the group of demographic characteristics,</u> it was established that the sellers, operating in digital shadow economy, to a large extent, are ***men*** (mean rank is equal to 3.68), ***aged from 18 to 29*** or ***from 30 to 49*** (mean ranks are respectively equal to 4 and 3.68) ***with higher education*** (mean rank is equal to 3.55).

The other proposed characteristics have been found insignificant, and due to this reason will not be analysed further in this article.

With reference to the results of the empirical research, the following propositions can be made: relying on the experts' professional experience, only professionals in their field with higher education are capable of performance of illegal activities in e-space, violating established legal norms and regulations. In many cases, these entities operate on the basis of officially registered activities. However, they get involved in digital shadow economy to evade taxation of the revenues earned from the operations in e-space. By the demographic characteristics, the common subjects of digital shadow economy include young or middle-aged men, whose officially accounted revenue does not reach the rate of the minimum wages, established in the Republic of Lithuania.

5. Conclusions

The results of the scientific literature analysis propose that digital shadow economy is determined not only by advancement of IT technologies as a tool for digital transactions, but also by a set of economic, ego and demographic determinants, reflecting its participants' economic-social position, environment and personality. The basic theoretical economic determinants of subject' participation in digital shadow economy include gain, cost reduction and lack of financial independence; the main ego determinants cover digital shadow economy participants' personal environment factors, such as important people's impact, poor or ineffective parenting practices and low monitoring, and a set of personal qualities; finally, the decision to get involved in digital black markets might be determined by subjects' gender, age, marital status, education, income and social status. The results of the empirical research have revealed that a seller, operating in digital shadow economy, can be represented as a young or middle-aged male with higher education, a professional in his operational field. With reference to the research results, sellers in digital shadow economy include the entities with officially registered activities, who are trying to evade taxation of the revenues earned from the operations in e-space. On the other hand, according to the experts, the amount of the officially accounted revenue earned by these entities may reach up to 300 EUR. Hence, the defined profile of an illegal seller, as of a subject, operating in digital shadow economy, proposes that a seller in

digital shadow economy is an intellectually developed person with advanced professional skills, but insufficient financial earnings.

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