PUBLIC USAGE OF E-GOVERNMENT IN EU COUNTRIES: ARE THERE ANY CONSEQUENCES FOR TAX EVASION?

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Abstract: *Due to the processes of digitalization and automation, the e-Government has become an essential tool of public administration. The paper deals with the problem of e-Government usage by the public and its potential connection to tax evasion. The analysis is based on available secondary panel and cross-sectional data on the level of EU countries in the period 2008 to 2021. We compare the situation in the countries and classify them into homogenous clusters based on the overall public usage of e-Government. Principal component analysis and cluster analysis have been used as tools for dimension reduction and clustering. Moreover, we also found evidence of a potential relationship between the usage of e-Government and tax evasion. The provision of online information and services by the government to its citizens as well as online communication with public authorities are related to the lower level of tax evasion in the country. Hence, public authorities should support e-Government usage and e-filing systems to fight against tax evasion.*

Keywords: *e-Government, tax evasion, online interaction, e-fillings, digitalization*

JEL Classification: H26, H83, H10

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https://doi.org/10.53465/ER.2644-7185.2023.3.129-149

1 Introduction

Digitalization in the business sector is progressing in leaps and bounds in recent years. Firms are currently applying new digital technologies such as AI, data mining tools or blockchain technology into their business processes. The public sector is often lagging behind the business in these aspects in most countries. However, we can also see certain improvements in digitalization in the public sector as well as the usage of e-Government by the public. In ideal circumstances, this can lead to an increase in the quality of public services and an expected decrease in administration and compliance costs related to taxation and regulation. The potential positive effects could also lead to a decrease in tax evasion. This paper is focused on examining the public usage of e-Government and the classification of EU countries into groups based on it. Furthermore, it is also examining the relationship between e-Government usage and the estimated level of tax evasion. The usage of e-Government for communication with the public authorities eliminates personal contact between officials and taxpayers to a minimum which in theory reduces the possibility of bribery. Moreover, online information and consultations improve the awareness of the tax law and potential fines among taxpayers. E-Government has also the advantage of providing digitalized information from taxpayers to the government. When the government is correctly using this data, it could be reflected in improved efficiency of the process of tax administration and tax audit. In the best-case scenario, these data can lead to more efficient detection of tax crime. From the perspective of taxpayers, there can be fewer possibilities for undetected free-riding.

The primary aim of the paper is to classify the EU countries based on the public usage of the E-Government and identify potential consequences for tax evasion. We have three secondary aims related to the primary aim as follows:

1. To identify a potential short-run relationship between public usage of e-Government and the share of tax evasion in the EU countries based on panel data.
2. To classify the EU countries into a relatively homogenous group with respect to the public usage of E-Government based on cross-sectional data.
3. To examine the potential relationship between the classification based on the intensity of e-Government public usage and the share of tax evasion in the EU countries.

We used available secondary macro-level panel data to examine trends and the potential relationship between both problems.

To fulfil the aim, we apply correlation analysis and the panel Granger causality test. We classified EU countries based on their similarity in the public usage of e-Government by using cluster analysis. In the next section, we summarize the theoretical assumptions related to the examined problem and provide some examples of previous research in this field. The methodology and data used in the analysis are described in the third section of the paper. The fourth section shows the most important results of our analysis with economic interpretation. Finally, we make conclusions in the last section of the paper.

2 Literature review

Society and digital technologies are very closely linked together. They dynamically transform the world, simplify many activities and bring more accessible and transparent information to people. Their influence on many social sciences is undeniable. We also perceive the impact of digitalization in the area of tax systems. Thanks to digitalization, the administrative burden can be reduced, cooperation between tax authorities can be improved, tax systems can be managed more efficiently and a lot of tax evasion can be eliminated. The concept of digitalization has been with us for several decades and affects our everyday life. According to the International Monetary Fund (2021), the interest in monitoring tax evasion has increased precisely because of the phenomenon of the digital economy. It is the digital economy that opens up possible opportunities and threats. Through the digital economy, it is possible to overcome obstacles on the market, it speeds up transactions, for example, tax payments, removes spatial restrictions, enables the creation of an effect of scale, or the creation of new business models through an important element, namely technology (Stavytskyy, Kharlamova & Stoica, 2019). In the modern world, we live in, technology can serve different purposes. Above all, to make everyday life easier. In particular, it can be about providing services to citizens, improving communication between two parties, or more efficient government management (World Bank, 2015).

By tax evasion, we mean an illegal act that deviates from the social norms that command the payment of taxes. In other words, tax evasion can be considered an intentional act by which a tax subject wants to circumvent the tax law in

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order to reduce his tax liability towards the state (Schneider & Enste, 2000; Orviská, 2005; Yamen et al., 2018; Alm, 2021; Transparency International, 2022). When defining them, we come across the concept of tax evasion, which represents a reduction in tax liability that does not violate the law, but on the other hand, uses the possibilities provided by the law. Tax evasion occurs when using the imperfections and ambiguities of legislation in the area of tax policy, but also by using legal regulations in the form of a preferential tax regime (Fuest & Riedel, 2009; Prebble & Prebble, 2010; Alm, 2012). Among the reasons that lead to the concealment of economic activities, Medina and Schneider (2018) advise mainly regulatory reasons, which basically include the avoidance of government bureaucracy and the absence of more effective ways of communicating with institutions - digitalization.

The concept of digitalization is currently widely used, but only a few authors conceptually distinguish between several terms, namely digital transformation, digitalization or digitization. Several authors (Hagberg, Sundstrom & Zandén, 2016) are of the opinion that the transformation consists of the transformation of analogue data into digital data, with the idea of better availability or higher transparency of services. Crittiden, Biel and Lovely (2019) take a different view and understand digitalization as a new way of interaction between two parties through the participation of digital channels. Bellon et al. (2022) see the importance of digitalization, on the other hand, in the way tax administration works by ensuring the ability to collect, process and monitor information from tax subjects.

Digitization consists of the transformation of information and digitalization in the transformation of processes (Bloomberg, 2018). The term digitization usually describes the technology itself in terms of what it is and what it is used for, while the term digitalization answers the question of why technologies are important (Saariko, Westergen & Blomquist, 2020). By skillfully combining both terms, we get the so-called digital transformation. The essence is the integration of hardware technologies into the products, processes and strategies of the company or organization. Public administration uses a digital transformation to streamline services for its clients in order to succeed in the digital age. Digital transformation includes components of digitalization or automation (Pratt, 2021).

According to Alm (2021), rapidly changing technologies probably influence the development of tax evasion in a positive direction from the point of view

of the governments of individual countries. Technological changes ensure a faster and smoother flow of information between tax subjects and public administration bodies and their subsequent analysis. They also facilitate the process of adopting measures or policies to eliminate tax evasion. The ability of governments to monitor and subsequently analyze transactions about which they have information makes it possible to increase the revenues of state budgets. However, digital technologies are available not only to public administration bodies but also to tax entities, which, thanks to their use, can circumvent legal regulations and thereby increase tax evasion (Remeikiene, Gaspareniene & Schneider, 2017).

In recent years, we have had the opportunity to observe a significant connection of tax evasion in the context of digitalization, in our case specifically with the initiative of electronic public administration. E-Government is an indicator that measures the effectiveness of public administration and measures the achieved level of digitalization in the field of public services (Pisár et al., 2022). The E-government system was mainly focused on simplifying the administrative burden of office workers (Hall, 2016). Subsequently, e-Government focused on electronic transactions themselves. The subject was simple payments such as paying fines or taxes levied on a tax subject, but also applying for a student loan or renewing identity documents (Choi & Chandler 2020). The level of digitalization of public administration increases in direct proportion to the increasing number of digital public administration services, operations and transactions that take place in the digital space. In connection with tax evasion, we encounter the opinion that tax evasion has a decreasing tendency in countries where public administration and the tax system are efficient in terms of tax collection and subsequent allocation of income (Sidani, Ghanem & Ravas, 2014). A different view of the issue is offered by Alm and Liu (2018), who claim that corruption is an important determinant of tax evasion. Thanks to digitalization, it is possible to reduce the level of corruption, which ultimately has an impact on reducing tax evasion. A study by Uyar et al. (2021), in contrast to previous studies, provides empirical evidence that the direction of the governments of individual countries and their ability to respond to changes plays a significant role in the elimination of tax evasion. The long-term orientation of governments to the provision of effective digital services and a quick response to technological changes are decisive factors for achieving the digital transformation of the public sector, which in turn causes a reduction in tax evasion.

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3 Methodology and data

The paper classifies EU countries based on the public usage of e-Government and its potential for the estimated level of tax evasion. The research is based on secondary macro-level panel data. Tax evasion has been in our research proxied by the estimates of the shadow economy in EU countries provided by Schneider (2021). Even though these two indicators are not the same, tax evasion is often intensively correlated with the share of the shadow economy. In our view, this indicator represents the best available indirect measure of overall tax evasion in the country. To analyse the public usage of e-Government and its development, we used data for the Digital Public Administration Factsheets, which are compiled by the European Commission annually. It evaluates the activities of EU states in this field. The report is divided into main 7 parts, and its overall goal is to support best practices in the field of digital service provision and their sharing among EU countries. It focuses on public administration, the usage of e-Government and the quality of public services. Data for each examined indicator is available in the Eurostat database. Based on the theoretical background and our main aim we choose four common e-Government usage indicators. These indicators represent our view of four levels of e-Government public usage as follows:

The first level (information): Individuals are using the Internet to obtain information from public authorities.

The second level (downloading): Individuals are downloading official forms from public authorities.

The third level (online filling): Individuals are sending online filled forms to public authorities.

The fourth level (online interaction): Individuals are directly interacting online with public authorities.

All four variables used in the analysis are in more detail described in Table 1. Tax evasion was indirectly captured by the estimates of the shadow economy as a percentage of GDP. The other four variables are used in the form of the percentage of individuals who used mentioned feature of e-Government.

Table 1: Description of variables used in the analysis

Variable	Description	Source
Tax evasion	Estimation of the shadow economy (in % of off. GDP) based on Schneider (2021) – used as a proxy for tax evasion	Schneider (2021) Development of the Shadow Economy of 36 OECD Countries over 2003 - 2021
Obtaining information	Percentage of individuals using the Internet for obtaining information from public authorities (%)	Eurostat (2022) Digital Public Administration factsheet - 2022
Downloading forms	Percentage of individuals using the Internet for downloading official forms from public authorities (%)	
Online filling	Percentage of individuals using the Internet for sending filled forms to public authorities (%)	
Online interaction	Percentage of individuals using the Internet for interacting with public authorities (%)	

Source: Authors based on the data from Eurostat and Schneider (2021)

Our dataset consists of a balanced panel including the data for EU27 countries. Together it contains 378 observations in the period from 2008 to 2021. Basic descriptive statistics of each variable are shown in Table 2.

Table 2: Basic descriptive statistics of variables used in the analysis

	Obs.	Mean	Median	Std. Dev	Min.	Max.
Tax evasion	378	18.73	19.1	14.35	5	77
Obtaining information	378	51.60	53.0	18.80	8	92
Downloading forms	378	36.33	37	14.35	5	77
Online filling	378	34.76	31	19.70	3	83
Online interaction	378	58.25	60	19.55	60	94

Source: Authors

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However, for cluster analysis and principal component analysis, we used cross-sectional data for the most recently available period (the year 2021).

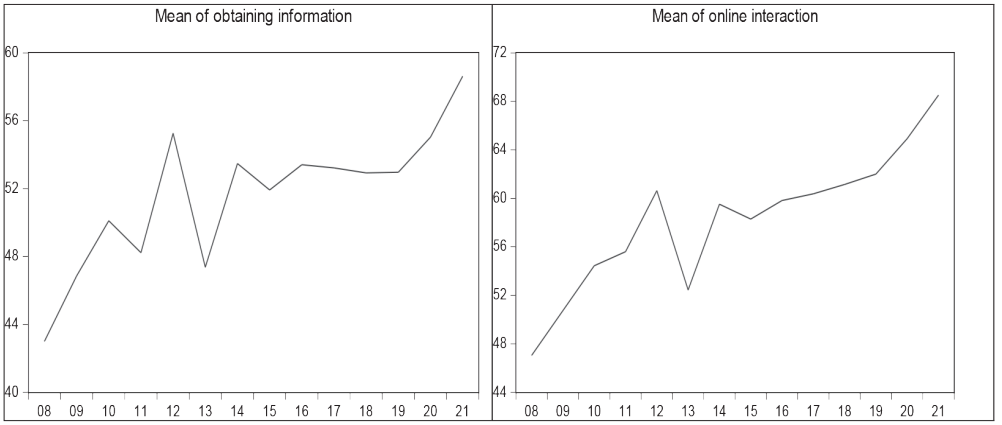
In the first step of the analysis, we graphically display the data and use Pearson correlation coefficients to identify potential linear relationships between each pair of variables. Furthermore, variables used in the analysis have been tested for weak stationary. We apply tests based on Levin, Lin & Chu (2002), Im, Pesaran & Shin (2003) and Fisher ADF and PP tests defined by Choi (2001) and Maddala and Wu (1999). The results of all tests are shown in the analysis. Variables which show weak stationarity at the level have been used in further analysis. On contrary, those which appear to be non-stationary at the levels are used at their first differences. Next, we calculated Pearson correlation coefficients between selected variables capturing the e-Government usage and tax evasion estimates. This allows us to identify the intensity of the potential connection between both examined problems. To examine this relationship in more depth we also tested the short-run causalities by using panel Granger causality tests.

Moreover, to classify the countries according to the public usage of e-Government we apply cluster analysis based on cross-sectional country-level data for the year 2021. Only mentioned four variables capturing the usage of e-Government have been used in the analysis. Due to the high positive correlation among most of the variables we decided to perform a Principal component analysis (PCA) before the cluster analysis. This allows us to eliminate this problem and reduce the dimension to two main components. The cluster analysis has been applied to these two components capturing almost all variability of public usage of e-Government. We used hierarchical cluster analysis with Ward's minimum variance classification method and Euclidean distance linkage measurement. This method is commonly used to classify countries into rather homogenous groups (clusters) based on their multidivisional similarity. Each cluster has certain characteristics concerning countries' overall public usage of e-Government. This methodology allows us to examine the differences in the estimated level of tax evasion among clusters of countries.

4 Results

In the first part of the analysis, we examined the tendencies in the public usage of e-Government. Figure 1 is showing the development in the share of individuals obtaining information from public authorities online and those using online interaction with public authorities in the EU. These two variables represent in our view the first and the fourth level of e-governed public usage. Despite slight differences, the situation is similar in the case of both indicators. There is an evident short-term drop in usage in the year 2013 but the overall trend appears to be increasing.

Figure 1: The development of the mean percentage of individuals obtaining information online and using online interaction with government – an average of EU countries



Source: Authors based on date from Digital Public Administration factsheet – 2022

All four variables capturing the public usage of e-Government and estimates of tax evasion have been tested for correlation by Pearson correlation coefficients. The results can be seen in Table 3. The table shows the Pearson correlation coefficients for variables without incorporating any potential lags or leads. The results indicate a negative linear correlation between tax evasion and all four variables capturing the usage of e-Government tools. The correlation coefficients are in the range between -0.33 and -0.4 which means a rather less intensive correlation. On the other hand, the correlation between all four variables of e-Government is positive and more intensive. The strongest positive correlation is between the percentage of individuals using the online filling and those using online interaction with the government. This means

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that the third and the fourth level of e-Government usage is strongly related together. These results are in line with our expectations.

Table 3: Pearson correlation coefficients between examined variables

	Tax evasion	Online interaction	Downloading forms	Online filling	Obtaining information
Tax evasion	1	-0.399	-0.402	-0.354	-0.333
Online interaction	-0.399	1	0.846	0.850	0.952
Downloading forms	-0.402	0.846	1	0.762	0.802
Online filling	-0.354	0.850	0.762	1	0.782
Obtaining information	-0.333	0.952	0.802	0.782	1

Source: Authors

In the next step, we tested the weak stationarity of all variables used in the analysis which is a necessary condition for the proper use of the Granger causality test. For this purpose, we applied four-panel unit-root tests. The results are shown in Table 4. It can be seen that two out of five variables are not stationary at their levels. Hence, we need to use their first difference, which is indeed stationary. Variables capturing online interaction, downloading forms and obtaining information are stationary even at their levels so we can use them directly at their levels in the Granger causality.

Table 4: Panel unit root tests of all variables used in the models

	Levin, Lin & Chu	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
Tax Evasion	-0.82	2.51	26.86	20.44
ΔTax Evasion	-14.7***	-10.52***	211.01***	262.01***
Online interaction	-12.57***	-4.66***	122.35***	101.89***
Downloading forms	-2.99***	-1.37*	85.04***	75.34**
Online filling	1.36	3.74	45.27	48.41

ΔOnline filling	-13.67***	-9.98***	192.74***	215.95***
Obtaining information	-10.68***	-5.34***	131.52***	143.03***

Source: Authors

After the unit-root test, we proceed to Granger causality between selected pairs of variables. The results are summarized in Table 5. Granger causality is using lags to capture potential delay and identify the direction of potential effect. In our case, we apply lags from the interval between one to three periods. The results appear to vary especially with different pairs of variables but significantly less with different settings of lags. There seems to be no statistically significant effect either from online interaction to tax evasion as well as in the opposite direction. On the other hand, we found a positive effect in the Granger sense acting in the direction of tax evasion by downloading online forms and online filling. This is significant for all three lags. Hence, it seems that the extent of tax evasion and the shadow economy in the country is affecting the way and intensity of how taxpayers and other individuals are using e-Government tools serving for sending information about themselves to the government. The usage of pre-prepared online forms and online fillings can be affected by the trust in the government, general attitude to digital technology as well as the intention of potentially illegal behaviour. Hence, we assume that in countries with overall higher tax evasion, the willingness to provide information online to the government could be significantly lower. We also found the effect arising from informing online about the share of tax evasion. Getting information from online government sources can increase the awareness of public services, and public administration as well as tax laws and potential penalties for violating them. On one hand, this can lead to more information on correct tax returns, tax payments and the extent of public services provided from collected taxes which can positively increase willingness to pay a tax. On the other hand, more information about the fines and penalties for tax evasion can lead to a lower incidence of tax crime.

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Table 5: Results of Pairwise Panel Granger causality tests

	F-statistic		
Number of lags:	1	2	3
H0: Online interaction does not Granger cause ΔTax evasion	0.46	0.75	0.47
H0: ΔTax evasion does not Granger cause Online interaction	2.39	1.06	0.54
H0: Downloading forms does not Granger cause ΔTax evasion	0.26	1.17	1.07
H0: ΔTax evasion does not Granger cause Downloading forms	15.98***	9.48***	6.09***
H0: ΔOnline filling does not Granger cause ΔTax evasion	0.07	0.06	0.21
H0: ΔTax evasion does not Granger cause Online filling	7.31***	3.68**	2.87**
H0: Obtaining information does not Granger cause ΔTax evasion	6.24**	2.37*	1.12
H0: ΔTax evasion does not Granger cause Obtaining information	1.1	1.34	1.80
Observations	324	297	270

Source: Authors´ own computation

Note: */**/*** means significance at the 10%/5%/1% level of significance

The next part of the analysis is focused on the classification of countries based on the overall public usage of e-Government. As we showed in the previous text there is a significant positive correlation between all four variables devoted to the usage of e-Government. This fact means that we need to use PCA first to ensure suitable conditions for cluster analysis, which should be performed on uncorrelated or only slightly correlated variables. Moreover, PCA also reduces the dimensions of our variables and shows us the relations between them. The results of PCA are shown in Table 6. Based on the eigenvalues we can choose only one component. However, increasing the number of components to two increase the cumulative variance capturing more than 0.95% of the variance in all four variables. Two components are also more reasonable inputs to the cluster analysis rather than a single one.

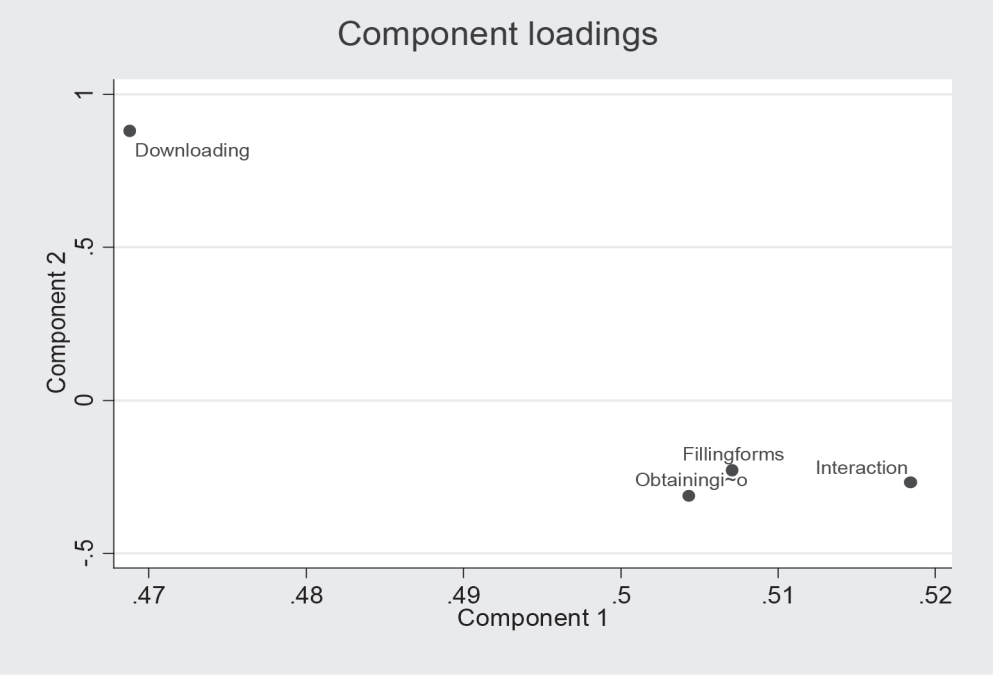
Table 6: The results of the principal component analysis

Component	Eigenvalue	Difference	Cumulative
Component 1	3.525	3.236	0.881
Component 2	0.289	0.152	0.954
Component 3	0.137	0.089	0.988
Component 4	0.048		1.000

Source: Authors own computation

The components loadings related to two selected principal components are graphically illustrated in Figure 2.

Figure 2: The components loadings of all four variables



Source: Authors own computation

It can be seen that obtaining information online, usage of online filling forms and online interaction with public officials are all mainly represented by the first component. The second component is capturing mainly the downloading of forms. These two components are further used as inputs into cluster analysis of EU countries based on their public usage of e-Government. We

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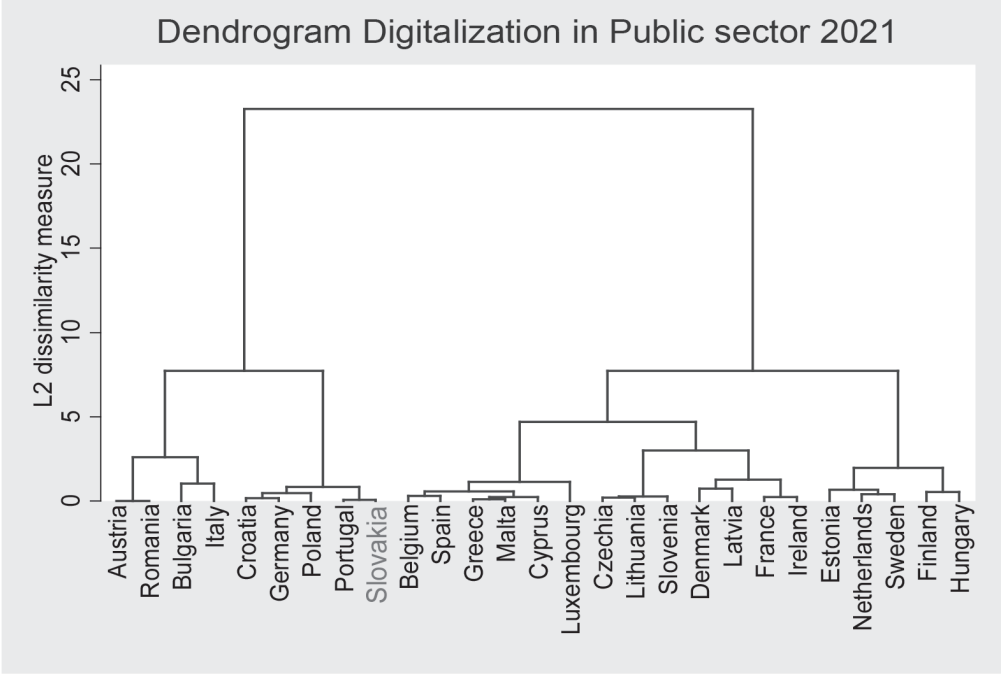
apply hierarchical clustering with Ward's minimum variance classification and Euclidean distance linkage measurement. The results of the clustering are graphically illustrated in the dendrogram in Figure 3. The clustering with the stated method of clustering appears to be the most effective one of all possible methods. For the identification of an optimal number of clusters, we used the Calinski-Harabasz index (see table 7). Based on its results we can say that three clusters seem to be the optimum. However, we can still see lower-level clusters in the dendrogram. Slovakia is included in the same cluster as Portugal, Poland, Germany and Croatia. It means that especially these four countries have the most similar usage of e-Government to Slovakia. On the longer distance, there is also an evident similarity with Austria, Romania, Bulgaria and Italy. All these countries are classified in the first cluster, which can be characterised by the lowest degree of overall public usage of e-Government Second cluster consist of Belgium, Czechia, Denmark, France, Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Cyprus and Spain. The third cluster contains countries with the most intensive usage of e-Government namely Estonia, Finland, Hungary, Netherlands, and Sweden.

Figure 3: Dendrogram of EU countries clustering based on the public usage of e-government – graphical illustration of the results from cluster analysis



Source: Authors own computation

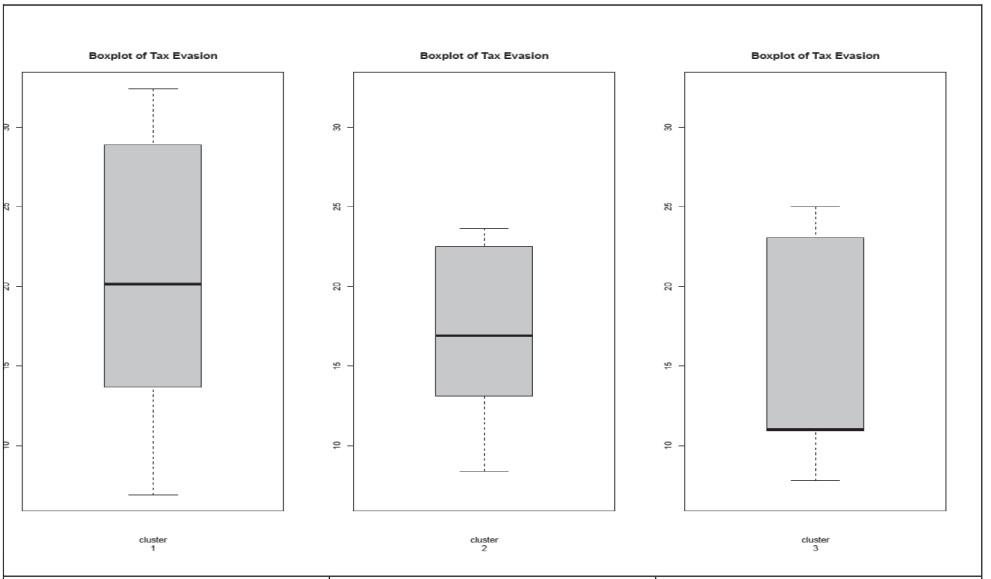
Table 7: Results of Calinski-Harabasz index used for the identification of the optimal number of clusters

Calinski/ Harabasz index	2	**3**	4	5	6	7	8	9
pseudo-F	43.69	**34.56**	48.24	54.10	56.31	69.93	83.80	89.88

Source: Authors own computation

Finally, we compare the estimated level of tax evasion among all these clusters based on the boxplot and basic descriptive statistics. As can be seen in Figure 4, the boxplots show us the potential relationship between public e-Government usage and tax evasion. Countries classified into the first cluster with the less intensive e-Government usage have the highest variability of estimated tax evasion but also the highest median level of estimated tax evasion. On the other hand, countries included in cluster 3 appear to have much lower variability and the lowest median level of estimated tax evasion. Hence, the group of countries with the most intensive public usage of e-Government are also mostly those where tax evasion represents the least significant problem.

Figure 4: Boxplots of tax evasion estimates for the three clusters based on e-Government usage



Source: Authors own computation

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Similar results can be seen in Table 8.

Table 8: Clusters classification based on e-Government usage

Clusters	Countries	Tax evasion (mean)	Tax evasion (median)
Cluster 1	Austria, Bulgaria, Croatia, Germany, Italy, Poland, Portugal, Romania, **Slovakia**	19.95	20.15
Cluster 2	Belgium, Czechia, Denmark, France, Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Cyprus, Spain	16.92	16.9
Cluster 3	Estonia, Finland, Hungary, Netherlands, Sweden	15.56	11.04

Source: Authors own computation

Countries included in cluster 3 have the lowest mean and median of tax evasion. On the other hand, those classified in cluster 1 recorded the highest mean and median of estimated tax evasion. This cluster also includes Slovakia.

5 Discussions

In our analysis we found evidence on the existence of potential relationship between e-government usage and tax evasion. There is relationship in the direction from tax evasion to usage of certain type of e-government service. Hence, it seems likely that the level of tax evasion is the quality and subsequently the usage of public services. In general tax evasion is usually negatively correlated with responsible civic behaviour and represent an obstacle for delivering of public services (Barrios et al., 2017). This kind of effect represent also a significant problem when fighting tax evasion. We can say that decreasing the level of tax evasion first to achieve more intensive usage of these e-Government tools it is firstly necessary to lower the level of tax evasion in the country. On the other hand, we also found some evidence of relationship in opposite direction. This is in line with some other studies which conclude that the digitalization of government services plays a significant role in alleviating tax evasion (Uyar et al., 2021). This relationship may be also

evident through the mediated effect of reduction in corruption as reported by (Alm and Liu, 2018). Successful transformation of government services can not only improve control and eliminate possibilities of cheating but e-government can actually improve the willingness of taxpayers to pay taxes. Hanousek and Palda (2004) based on the data from Slovakia and Czechia conclude that the tax evasion is lowest among those who believe that they are getting good quality government services for their taxes.

Despite our best effort to apply the best possible methodology to achieve our goals, there are still some limitations. First of all, we used the estimated size of the shadow economy as a variable mirroring the share of tax evasion in the country. Despite some differences in both indicators this approach is common and allows us to indirectly capture the estimated size of the tax evasion which we are not able to measure. Due to the chosen methods, we are not able to estimate any direct causal effect and apply any control variables for panel data analysis. This approach allows us only to examine the relationship between the pairs of variables. To further examine the intensity and significance of potential causal effects, it would be more appropriate to use regression analysis based on fixed effects, random effects regressions or the GMM approach. Moreover, the classification of EU countries is based on cluster analysis which allows using several different variants. This can to some extent change the results. However, the differences among the different settings are usually not substantial.

6 Conclusions

The paper focused on the classification of EU countries based on overall public usage of e-Government. Furthermore, it also to some extent examine the relationship between e-Government usage and the estimated level of tax evasion. Based on the results of correlations analysis, and Granger causality tests we found empirical evidence for this relationship. Both problems appear to be related at different levels. The effect is evident in the direction from tax evasion to the share of individuals filling online forms and downloading prepared forms. This means that the current level of tax evasion is affecting the willingness of individuals to share information online with the government in the future. Hence, to achieve more intensive usage of these e-Government tools it is firstly necessary to lower the level of tax evasion in the country. Trust in government, social responsibility and ethical norms can be seen as a

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factor affecting both of these problems. On the other hand, more frequently obtaining information online from officials appears to affect tax evasion. It can imply that the increase in awareness of tax laws and potential fines among taxpayers can change tax evasion. More information about public services as well as social and individual benefits owing to public expenditures can influence the willingness to pay taxes for some individuals.

Based on the results we can say that Slovakia is included in the cluster with the lowest overall usage of e-Government. This cluster also has the highest median and average estimated level of tax evasion. The potential link between the usage of e-Government and tax evasion appears to be evident based on all three clusters. Countries included in the clusters with the higher public usage of e-Government mostly showed lower tax evasion. Countries with the highest overall e-Government usage based on our four variables are Estonia, Finland, Hungary, Netherlands, and Sweden.

Acknowledgments

This work was supported by the Slovak Research and Development Agency under the contract no. APVV-20-0338.

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