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Does Household Tax Burden Have an Impact on Individuals' Savings in Banks? The Case of Ukraine

Abstract
This paper aims to assess the impact of the effective and nominal household tax burden on household deposits in Ukrainian banks. We used the effective tax burden, which includes personal income taxes and value-added tax (VAT) paid. We considered changes in Ukrainian tax law from 2003 to 2016, which included a change from progressive income taxation to proportional income taxation, a decrease in tax rates in 2003, and an increase in tax rates in 2014–2016. The data sample consists of publicly available data on Ukrainian households' income, savings, and taxes paid in 1996–2019. The analysis was performed using panel regression and the difference-in-difference (DID) method. The tax burden impact on bank deposits is significant and is caused partly by the shadow economy.
The results of the study are relevant for Ukraine and countries with similar economies. The methodological approaches developed in the paper can be used for similar studies in other developing countries.

Keywords
direct taxes | indirect taxes | personal income tax | government revenue | taxable income | effective tax burden | consumption | income structure | spending structure | savings | bank deposits | Ukraine

JEL Codes
H21, H24, H31, E27

1. Introduction

The paper aims to assess the impact of the effective and nominal household tax burden on household deposits in Ukrainian banks. Tax burden is one of the key factors affecting a country's economic development. The impact of the tax burden on macroeconomic indicators varies from country to country. In some countries, an increase in tax burden has a negative impact on consumption or savings, while in other countries a reduction in the tax burden in general or for specific taxes has a positive impact on economic dynamics (Gaertner, Lynch, & Vernon, 2018). One of the phenomena in developing countries is that taxpayers believe that all negative effects taking place in an economy are caused by a high tax burden. However, these opinions are far from being empirically grounded but are often taken as axioms by those taxpayers. Paientko & Oparin (2020) proved that the average tax burden in Ukraine, including personal income taxes, is at the median level of tax burden in OECD (Organisation for Economic Co-operation and Development) countries. This means that the tax burden may not be the most significant factor affecting economic processes.

One important problem facing developing countries is insufficient domestic investment because citizens either do not trust the domestic financial market or cannot invest money, partly because of the high tax burden. A relatively high level of corruption resulting in a shadow economy stimulates taxpayers to save money using the most secure ways. In developing countries, two of the most popular options are holding money in cash and in bank deposits. Bank accounts are understandable to ordinary citizens, and in most countries, a certain amount of the deposit is returned

to the saver even if the bank goes bankrupt. Ukraine is no exception in this regard, and most household savings are held in bank accounts. A fair amount of cash is held at homes, and quite often this money cannot be put into a savings account because the owners cannot prove the eligible source.

The impact of taxation on savings rates in the banking system has long been studied by economists. The early studies focused mainly on the use of tax instruments to incentivise household savings (Byrne, 1976). Recent studies consider not only the incentive effect of tax instruments on savings but also the negative or even neutral effects. Bastani and Waldenström (2018) found that taxation can have a significant impact on savings, including bank savings accounts. However, this impact will depend on many other factors, including the condition of the financial market. Tax burden remains the dominant factor affecting bank deposits. Taxation affects the amount of income that households have left to save. Taxation also affects taxpayer behaviour psychologically, as an increase in the tax burden may encourage people to withhold income from taxation, thereby reducing the amount of organised savings.

The impact of the tax burden can be assessed using measures of the nominal and effective tax burden. It should be noted that researchers estimate the effective tax burden in different ways, with the general approach being to consider the payment of all taxes relevant to income (Bräutigam, Spengel, & Stutzenberger, 2018). Approaches to calculating the effective tax burden may vary, depending on the purpose of the study (i.e., the factor on which the impact is being assessed). Many studies are devoted to assessing the effective tax burden on corporations and their behaviour (Delgado et al., 2014; Dyreng et al., 2017). Recent studies are focused on the effective taxation of individuals as well (Lapatinas, Kyriakou, & Garas, 2019). It should be noted that in developing countries the tax burden on personal income may be moderate, but the level of consumption taxation may be much higher. This is often due to the high level of the shadow economy, with the result that indirect taxation has a higher fiscal efficiency than direct taxation. Ukraine is not an exception, with the personal income tax rate being 18% and the VAT rate being 20%. Thus, to assess the impact of taxation on any economic process in Ukraine, the effective tax burden should be used. The assessment of the tax burden on personal income in Ukraine is complicated by the high degree of the shadow economy. At the same time, figures on the Ukrainian economy published by the Ukrainian government and foreign sources differ considerably (Schneider & Buehn, 2018). That is, there is no single indicator of the shadow economy that can be trusted.

It should be noted that many scholars have studied the impact of taxation on savings in individual countries (Frankema, 2010; Gandullia, Iacobone, & Thomas, 2012; Gemmell, Kneller, & Sanz, 2014). That is due to the need to take into account the individual characteristics of a particular country. However, such features not only relate to characteristics of the tax system or the institutional environment of the state but also to characteristics of the sample design for the empirical estimation of the effective tax burden. The assessment of the effective tax burden on households in Ukraine has not been a topic of much recent research. The development of the methodology itself for assessing the effective tax burden is, therefore, an important issue. Also, assessing the impact of taxation on household activity in the financial market is often a matter of speculation among Ukrainian politicians. Some of them try to manipulate notions of tax burden and the assessment of its impact for political reasons. It is understandable that in countries with a high tax burden on personal income and low bank interest rates, the growth of investment in bank deposits may be limited. However, in Ukraine, deposit rates in periods of stable economic development are at 6%–11% per annum, depending on the size and period of the deposit (www.bank.gov.ua). Therefore, a study of the impact of the tax burden on bank deposit dynamics is a relevant topic for developing countries and Ukraine in particular.

Considering the above, we formulate the following hypotheses:

> H_1: An increase in the effective tax burden has a negative impact on household savings in banks.
>
> H_2: A decrease in nominal income tax burden has a positive impact on household savings in banks.

The article is organised as follows: The second section discusses the literature review of the investigated problem. The third section describes the research methodology. The fourth section displays the main results of the study and discussion. The fifth section presents findings, study limitations, and prospects for further research. The results of the study are relevant not only for Ukraine; the methodological approaches developed can be used for similar studies in other developing countries.

2. Literature Review

Taxation, or tax burden, represents one of the most significant factors that can influence economic growth and social welfare, which can be the primary aim of economic policymakers (Macek, 2018). Researchers have different views on the impact of the tax burden on savings and consider different factors for specific countries.

Niculescu-Aron and Mihăescu (2012) suggest that the level of economic development should be the main parameter in decisions aimed at stimulating household savings. They proved that in times of economic prosperity, families save money because they either have excess from the income increase or they anticipate significant gains from interest. This is because either they are stimulated to save through adequate fiscal policies and/or they believe in the favourable evolution of the economy.

Since savings in the form of bank deposits can be regarded as capital, it is also very important to consider the tax treatment of such capital; this is because the behaviour of taxpayers may change in a tax-dependent manner for capital gains (Bastani & Waldenström, 2018). For example, households may be inclined to invest more in deposits if the income on the deposits is not taxable. Thus, it is important to assess the impact of changes in the tax burden on taxpayer behaviour to invest in bank deposits.

Research on taxpayer behaviour under the influence of various factors has gained prominence in the twenty-first century (Chiappori & Mazzocco, 2017). Researchers have been particularly interested in the behavioural aspects of taxation (Seim, 2019). In this sense, the payment of taxes is a kind of trigger for a certain type of taxpayer behaviour. Since taxes can influence the behaviour of taxpayers and their decision making, a study of taxation's impact on investment in deposits could be a separate area of research in its own right.

Bird and Zolt (2005) argued that income taxation may have a limited effect in developing countries because they often do not implement progressive taxation and have high opportunity costs due to high levels of tax evasion and the presence of a shadow economy. However, this does not mean that the impact of the income tax burden should not be used in developing countries to regulate taxpayer behaviour. It does mean that studies should use additional control variables, such as the level of tax evasion or the the shadow economy level.

Many economists argue that tax incentives have a positive impact on savings in banks (Attanasio & Wakefield, 2010; Ayuso, Jimeno, & Villanueva, 2019; Disney, Emmerson, & Wakefield, 2010). Researchers attribute this to the positive impact of a lower tax burden on total household income. Reducing the tax burden can be achieved by applying tax exemptions and deductions, lowering tax rates on interest on deposits, and/or exempting taxation on savings accounts.

Researchers have also considered the impact of taxation on the propensity to save, that is, the characteristics of savings formation by low- and middle-income families (Duflo et al., 2006). Economists believe that a favourable savings environment contributes to a strong middle class. This is especially important for developing countries, which are characterised by a high level of income inequality and high poverty rates.

The current issue is the taxation of high incomes and how this affects savings (Beshears et al., 2017). This aspect is particularly important for countries with high levels of income inequality. Progressive taxation combined with incentives for savings can contribute to a better redistribution of wealth and thereby help to reduce income inequality.

To summarise the above, governments in developing countries should avoid the negative impact of the tax burden on bank deposit dynamics. To assess the impact of taxation on savings in the form of bank deposits, not only the nominal tax burden but also the effective tax burden should be used. However, it should be noted that the procedure for calculating the effective tax burden may vary slightly from country to country. In other words, national governments should adjust the methodology proposed in the article to the structure of household income and the available statistics.

3. Methodology

The research methodology consists of three parts. The first part reflects the calculation of the effective tax burden indicator. The second part aims to assess the impact of changes in the effective tax burden on savings in the form of bank deposits. The third part aims to assess the impact of change in the nominal tax burden on savings in the form of bank deposits.

3.1. Effective tax burden calculation

Researchers use different approaches to estimate the impact of the tax burden on savings dynamics. Most researchers use measures of the effective tax burden to obtain more realistic results (Martinez-Mongay, 2000; Mendoza, Razin, & Tesar, 1994). Considering the approach used by the authors mentioned, we used the following indicators for calculation of the effective tax burden:

- average individual's salary before taxes
- aggregate expense structure for an average household in Ukraine
- tax rates during the research period and year of introduction (if applicable)

For the effective tax burden calculation, we used income and expense statistics from the State Statistics Service of Ukraine (www.ukrstat.gov.ua). The statistics include the general expense structure and basic income sources for an average Ukrainian household. Then we applied relevant tax rates to expenses to determine the tax amount paid while purchasing particular categories of goods and services. Hence, we calculated the aggregate tax amount paid. The total amount of taxes received was divided by the total income amount, and the result is the effective tax burden for a particular period.

3.2. An assessment of the impact of changes in the effective tax burden on the dynamics of savings in the form of bank deposits (testing the first hypothesis)

There are two common approaches used to estimate the impact of the tax burden on household investments in bank deposits. The first approach involves estimating the elasticity of the amount of household bank deposits for changes in the tax burden.

The second approach involves estimating the impact of significant changes in taxation on household bank deposits (i.e., how deposits have changed following a particular taxation decision). For example, a marker for such an assessment could be a change in the income tax rate. To assess the impact of changes in the effective tax burden on household savings in the form of bank deposits, we have chosen the second approach.

Scholars often use a DID method to estimate the effect of a particular factor on a targeted indicator (Athey & Imbens, 2006; Bonhomme & Sauder, 2011; St. Clair & Cook, 2015). The essence of the method is that the influence of a factor is assessed using two regression lines. One is actual and the other is conditional, reflecting the behaviour of the dependent variable as if the independent variable had not changed.

Bertrand, Duflo, and Mullainathan (2004) suggest that, because of serial correlation, conventional DID standard errors may grossly understate the standard deviation of the estimated treatment effects, leading to serious overestimation of t-statistics and significance levels. In addition, the magnitudes of the estimates obtained in these false rejections do not seem out of line with what is regarded in the literature as "significant" economic impacts. In other words, too many false rejections of the null hypothesis of no effect have taken place.

The basic equation for the DID model follows:

$$\mu_{it} = \beta_0 + \beta_{post}*\text{Post} + \beta_{exp}*\text{Exposure} + \beta_{interaction}*\text{Post}*\text{Exposure} + \varepsilon_{it},$$

where μ_{ij} is the expected mean value for subject i at time t, Post is a binary indicator showing that the outcome measurement was made in the post period, Exposure is a binary indicator showing that the subject is in the exposure group during the post period, and ε_{it} is the error term for the outcome measure of subject i at time t. As usual, errors are assumed to be normally distributed with a mean of zero (Warton, Parker, & Karter, 2016).

3.3. Testing the first hypothesis

The following variables were included in the model:

- the independent variable, effective tax burden
- the outcome variable, household savings in the form of deposits
- a dummy variable to indicate changes in household taxation

Changes in household taxation were implemented in Ukraine in 2014, 2015, and 2016. All changes are related to the changes in the tax rates and tax exemptions that overall affect tax burden. The military fee (1.5%) was implemented in 2014 as an additional tax on personal income. In 2016 the personal income tax rate increased from 15% to 18%.

Since all the data for effective income calculation are available only from 2008, the first hypothesis was tested for 2008–2019.

3.4. Research sample

The sample consists of the data from Ukraine for the years 2008–2019. The data on household income and its structure is available at the website of the State Statistics Service of Ukraine[1]. The raw data on taxes paid are available from the website of the State Treasury Service of Ukraine[2]. The information about the number of bank deposits is available at the website of the National Bank of Ukraine[3].

Calculations were conducted in R using package "stats". For the DID estimation, the dummy variable "Change" was used to indicate the years of changes, where "one" states the overall change in tax burden and "zero" means no change. Before calculations, the data were normalised using the "log" function.

To present the calculations summary, the "summary.lm" function was used.

The sample of programming code is provided below:

```
> mydata=read.table("Input_data.csv",sep = ";",head=T)
> DiD=mydata$Tax_burden*mydata$Change
> fit=lm(mydata$Tax_burden~mydata$Deposits+mydata$Change+DiD, mydata)
> summary(fit)
```

The regression results were tested for robustness by using statistical criteria built into R.

3.5. An assessment of the impact of change in the nominal tax burden on the savings in the form of bank deposits (testing of the second hypothesis)

The nominal tax burden may vary in different regions in Ukraine; therefore, we chose panel regression to test the second hypothesis.

The following variables were included in the model:

- the independent variable, nominal income tax burden
- the outcome variable, household savings in the form of deposits
- a control variable, a share of the shadow economy in Ukraine
- a control variable, an inflation rate in Ukraine
- a dummy variable to indicate changes in the taxation of households

Changes in household taxation were implemented in Ukraine in 2003, 2014, 2015, and 2016. All changes are related to the changes in the tax rates and tax exemptions that overall affect tax burden. In 2003 the progressive personal income tax was replaced by a flat personal income tax. The military fee (1.5%) was implemented in 2014 as an additional tax on personal income. In 2016 the personal income tax rate increased from 15% to 18%.

It should be noted that the impact of Ukrainian financial market conditions can be considered neutral. The repayment of deposits to individuals is guaranteed by the Deposit Guarantee Fund, and interest rates provide higher yields compared to other financial instruments. Therefore, we did not include financial market parameters in the model as control variables.

3.6. Research sample

The sample consisted of the quarterly data from Ukraine for the years 1996–2019. The data for 1991–1995 were not included in the sample due to the high level of inflation. The data were organised in the form of panels. Data from the Donetsk and Luhansk oblasts and the Republic of Crimea were not included in the sample. Panel data allow the combination of spatial (in our case, the region [oblast]) and time series (in our case, the quarterly income tax burden data and bank savings) to be displayed. Panel data contain a larger number of observations characterised by greater variation and less collinearity of the explanatory variables, giving a greater number of degrees of freedom and providing greater efficiency in the estimates.

The data on household income and the inflation rate are available at the website of the State Statistics

1 http://www.ukrstat.gov.ua/operativ/menu/menu_u/virdg.htm
2 https://www.treasury.gov.ua/ua/file-storage/vikonannya-derzhavnogo-byudzhetu
3 https://bank.gov.ua/ua/statistic/sector-financial/data-sector-financial

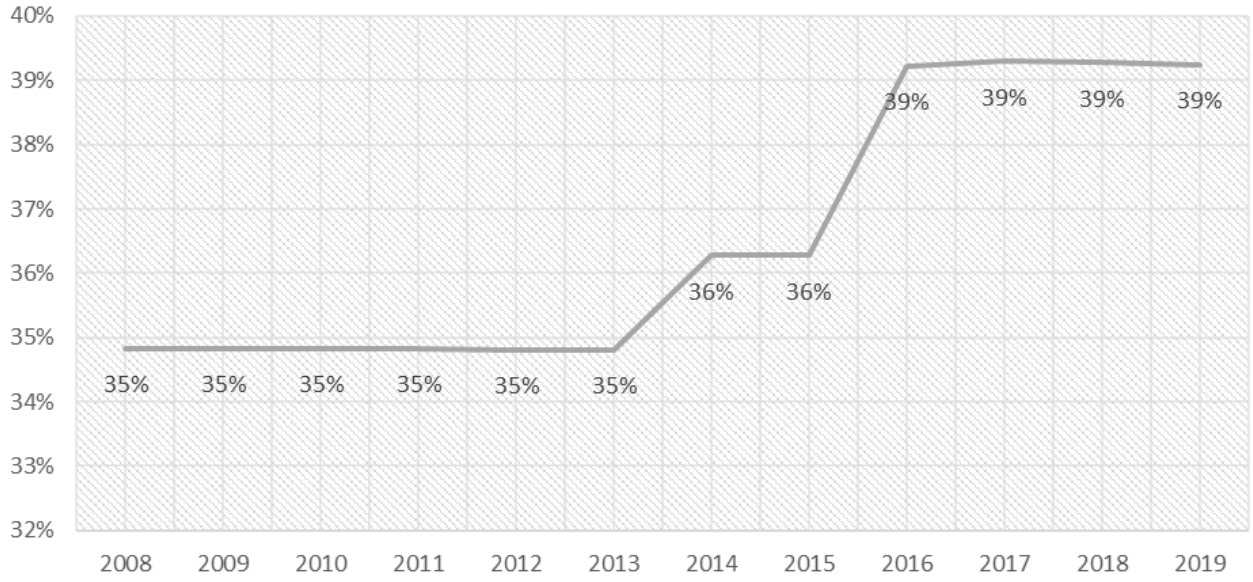

Figure 1. Effective tax burden on households in Ukraine in years 2008–2019
Source: Created by the authors with data from the State Treasury Service of Ukraine

Service of Ukraine[4]. The raw data on taxes paid are available at the website of the State Treasury Service of Ukraine (https://www.treasury.gov.ua/ua/file-storage/vikonannya-derzhavnogo-byudzhetu). The information about the number of bank deposits is available at the website of the National Bank of Ukraine (https://bank.gov.ua/ua/statistic/sector-financial/data-sector-financial). The information on the level of the shadow economy is available at the website of the Ministry for Development of Economy, Trade, and Agriculture of Ukraine (2018).

The analysis was carried out using R software, package "plm". Three models were used for the analysis, specifically, pooling, random, and within. All three models can be written as follows:

$$(1)\ yit = \alpha + x'it\beta + z'i\gamma + ci + uityit = \alpha + xit'\beta + zi'\gamma + ci + uit,$$

where z′iγ is the vector of characteristics that are not changing in time, ci and uit are random components.

In the model with random effects (REs), it is assumed that E(ci|zi,Xi) = 0E(ci|zi,Xi) = 0.

In the fixed-effects (FE) model, it is assumed that E(ci|Xi) E(ci|Xi) depends on XiXi. The model with fixed effects does not allow us to estimate αα and γγ.

In the pooling model, it is assumed that ci = 0ci = 0.

4 http://www.ukrstat.gov.ua/operativ/menu/menu_u/virdg.htm).

Models were tested with the F-test, the Lagrange multiplier test (Breusch-Pagan), and the Hausman test.

4. Results

4.1. Effective tax burden calculation

The results of the efficient tax burden calculation, as described in the Methodology section, is shown in Figure 1.

As can be seen from Figure 1, the effective tax burden sharply increased twice. This tendency was caused by an increase in the personal income tax (PIT) rate in 2016 from 15% to 18% and the application of a military duty fee starting in 2014 at a rate of 1.5%. Other reasons are related to the cancellation of some of the tax preferences and preventive actions to informal employment taken by the government (Table 2). It should be noted that the fees for utilities in Ukraine are constantly increasing. This caused a growth in the amount of VAT paid. Meanwhile, low- and middle-income households faced a higher VAT burden because their share of consumption is higher than the share of high-income households. The structure of household spending in Ukraine is shown in Table 1.

An increase in tax burden can have a significant impact on taxpayer decisions. For example, part of the income may be paid informally, without accounting

Table 1. The structure of household spending in Ukraine in 2008–2019

Years	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Categories (%)												
Food and soft drinks (%)	48,90	50,00	51,60	51,30	50,10	50,10	51,90	53,10	49,80	47,90	47,70	46,60
Alcoholic beverages, tobacco products (%)	2,20	3,20	3,40	3,40	3,50	3,50	3,40	3,30	2,90	3,10	3,40	3,20
Clothes and shoes (%)	5,90	5,60	6,00	5,70	6,10	5,90	6,00	5,70	5,60	5,50	5,40	5,50
Housing, water, electricity, gas and other fuels (%)	9,10	9,40	9,20	9,60	9,90	9,50	9,40	11,70	16,00	17,00	15,20	14,60
Household items and appliances, current housing maintenance (%)	2,80	2,30	2,30	2,20	2,30	2,30	2,30	2,00	1,70	2,00	2,10	1,80
Health care (%)	2,70	3,10	3,20	3,20	3,40	3,40	3,60	3,70	4,20	3,80	4,00	4,10
Transport (%)	4,00	3,80	3,70	4,00	4,30	4,30	4,30	3,70	3,60	3,70	3,70	4,80
Communication (%)	2,30	2,50	2,70	2,60	2,80	2,80	2,80	2,40	2,30	2,40	2,60	2,80
Recreation and culture (%)	2,50	1,80	1,80	1,90	2,00	2,10	1,80	1,50	1,40	1,60	1,80	1,60
Education (%)	1,30	1,30	1,30	1,30	1,30	1,20	1,10	1,10	1,00	1,10	1,00	1,10
Hotels and restaurants (%)	2,40	2,50	2,40	2,50	2,50	2,50	2,00	2,00	2,20	2,30	2,40	2,60
Other goods and services (%)	2,10	2,30	2,30	2,40	2,60	2,60	2,70	2,70	2,50	2,50	2,70	2,60
Non-consumer aggregate costs (%)	13,80	12,20	10,10	9,90	9,20	9,80	8,40	7,10	6,80	7,10	8,00	8,70

Source: Created by the authors with data from the State Treasury Service of Ukraine.

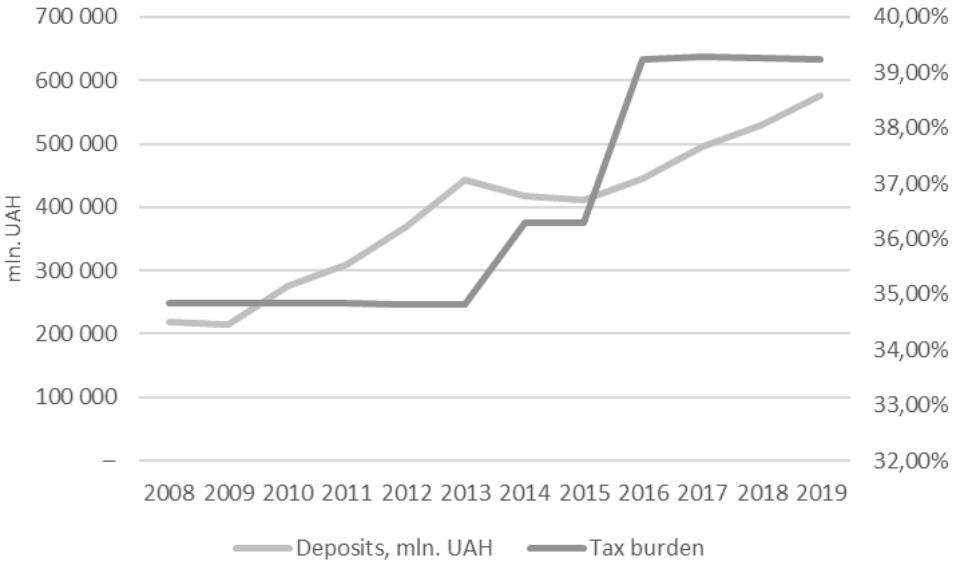

Figure 2. Effective tax burden and household investments in the form of bank deposits in Ukraine in 2008–2019
Source: Created by the authors with data from the State Treasury Service of Ukraine, National Bank of Ukraine

records and without taxes paid. Since Ukraine is a country with a large shadow economy, the correlation between the size of the shadow economy and depositing household savings into banks must also be investigated.

The high tax burden on taxpayer income may encourage taxpayers to transfer their income to jurisdictions with lower tax rates (Paientko & Oparin, 2020). For low-income countries, this tendency will have a negative impact on the economy, because it

means a high risk of financial resources outflow. It proves the necessity of calculating effective tax burden and monitoring its influence on household savings. It should be noted that, since 2014, deposit interest has been taxed by PIT and military tax.

4.2. Assessing the impact of changes in the effective tax burden on the dynamics of savings in the form of bank deposits

Figure 2 shows the dynamics of household bank deposits in Ukraine and the effective tax burden.

4.3. Test of the first hypothesis

The influence of the effective tax burden on household savings in the form of bank deposits was estimated by using a DID method, as described in the Methodology section. The results of the hypothesis test are shown in Table 2.

According to the R^2, there is low correlation between the dependent and independent variables. The adjusted R^2 is low due to the short period for analysis. The calculated F-statistic (Fisher's test) exceeds the tabular indicator. According to the calculations, there is no significant impact on household savings in the form of bank deposits from the changes in the effective tax burden. Therefore, the hypothesis is not confirmed.

One of the possible reasons for the results obtained could be the shadow economy. According to a Ministry of Economic Development and Trade of Ukraine estimation, in March 2020 the share of the shadow economy in Ukraine was at 31% (2020). It should be noted that, due to the large size of the shadow economy in Ukraine, the numbers of effective tax burden might be biased.

The structure of expenditures of households is another possible reason for the results obtained. Low- and average-income households spend nearly all their income on current consumption or keep money in cash. According to a World Bank report, in 2017 poverty increased significantly compared to 2015, with access to services and livelihoods particularly impacted in conflict-affected areas. A deep recession, the devaluation of the national currency (nearly 80% in 2014–2015), and the compression of public

Table 2. Results of first hypothesis test

	Coefficient (standard error)	**t value**
(Intercept)	0.008*** (0.002)	26.614
Deposits	0.023*** (0.0111)	4.373
Change in taxation	–0.311# (0.477)	–1.891
DID	0.044# (0.332)	1.741
Multiple R^2	0.754	
Adjusted R^2	0.6617	
F-statistic	8.172***	

Source: Calculated by the authors on the basis of data retrieved from the State Treasury Service of Ukraine, National Bank of Ukraine.
Signif. codes: *** = 0.01; # = 0.15.

Table 3. Description of the results for hypothesis 2

	Dependent variable		
	Household savings in the bank deposits		
	Pooling	**Random effects**	**Fixed effects**
Nominal personal income tax burden	–0.118**	–0.111*	–0.211**
	(0.045)	(0.022)	(0.048)
Share of shadow economy	0.101**	0.002	–0.008**
	(0.048)	(0.022)	(0.003)
Inflation rate	0.231	0.222	–0.308
	(0.188)	(0.167)	(0.243)
Changes in income taxation rules (dummy)	–0.202	–0.011	–0.101
	(0.118)	(0.018)	(0.061)
Observations	2112	2112	2112
R^2	0.388	0.298	0.589
Adjusted R^2	0.364	0.288	0.549
F-statistic	19.3***	1.3	21.6***

Source: Calculated by the authors with data from the State Treasury Service of Ukraine, National Bank of Ukraine.
Signif. codes: *p < 0.1; **p < 0.05; ***p < 0.01. Standard errors are given in brackets below coefficients.

expenditures contributed to a significant contraction of disposable incomes in Ukraine, with both labour and nonlabour incomes contracting in 2015 in real terms. As a result, the estimated poverty rate (under $5/day in 2005 PPP) increased from 3.3% in 2014 to 5.8% in 2015, while the estimated moderate poverty (the National Bank of Ukraine's methodology for Ukraine) increased from 15.2% in 2014 to 22.2% in 2015 (World Bank Group, 2017).

4.4. The testing of the second hypothesis

The results of the regression analysis are presented in Table 3.

The regression results were tested for robustness. As can be seen from the results of the regression analysis, the overall regression model and the FE model are significant. Inflation and the fact that taxation rules have changed do not affect household behaviour regarding investment in bank deposits. It should be noted that Ukraine radically changed income taxation of its citizens once, in 2003, from progressive to proportional taxation. However, the one-time reduction in the tax burden mentioned has not influenced the savings of citizens.

The impact of the tax burden on bank deposits is significant. If the nominal tax burden increases by 1%, bank deposits decrease by 1.18 percentage points, according to pooling regression, and by 2.11 percentage points, according to regression with fixed effects. It should be noted that the size of the shadow economy has a positive effect on bank deposits in Ukraine. With a 1% increase in the shadow economy, bank deposits increase by 1.01 percentage points, according to pooling regression, and by 0.08 percentage points, according to regression with fixed effects. This effect can be explained by the fact that in the Ukrainian banking system the origin of money for small deposits is not controlled.

Considering what is stated above, the second hypothesis is confirmed.

5. Conclusions

In this paper, we calculated the effective tax burden on household income in Ukraine and its impact on household savings in the form of bank deposits. We also tested how the nominal tax burden affects the trend in household bank savings. The results of the analysis show that the effective tax burden on household income does not have a significant impact on the dynamics of household bank savings. This is due to the fact that Ukraine has a growing proportion of poor people, most of whose income is used for consumption. At the same time, the trend of household bank savings is negatively affected by the nominal tax burden of income taxes. When the nominal income tax burden rises, the volume of bank deposits of households decreases with high elasticity. The shadow economy also has a positive impact on the size of households' bank savings. This means that part of the increase in bank savings comes from earnings on which income tax has not been paid. The results indicate that an increase in the tax burden through income taxes would increase the likelihood of a decline in household bank deposits. Considering that an effective tax burden does not have a significant negative effect on household savings, it is safer for the government to increase consumption taxes in order to increase tax revenues and to improve the efficiency of tax administration at the same time.

This study contributes to studies on household tax burden impact. The results of the study are relevant not only for Ukraine; the methodological approaches developed can be used for similar studies in other developing countries.

The study has several limitations:

1. For effective tax burden calculations, the total income amount was taken for all households as an average (without division into groups and by region). For the next stage of research, we plan to calculate the effective tax burden for low- and middle-income households.
2. We calculated the effective tax burden using average income. We did not divide households into clusters according to the share of income sources, taking into account entrepreneurial income, pensions, scholarships, subsidies, benefits, or tax deductions. The cluster approach will be applied at the next stage of the research.
3. We used different time frames for assessing effective and nominal household tax burden due to data availability.

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