PREDICTIVE ABILITY OF ACCOUNTING STANDARD IAS 12 IN AGRICULTURE

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Abstract

The predictive value of tax allocations (deferred taxes) and their incremental power in explaining future cash taxes paid and current tax expenses in the agricultural industry is a topic of significant relevance. This is particularly important for policymakers and managers due to the complexity of accounting standards in this area. The goal of the paper is to enhance the understanding of tax planning techniques used by agricultural companies. We consider four variables crucial in our analysis: dependent (cash taxes paid and current tax expenses) and independent variables (deferred tax assets and deferred tax liabilities). Our modelling of the relationship reveals that current tax expenses have a predictive power to explain variations in the cash outflow for income taxes, making it a relevant factor. Deferred tax assets explain the cash tax outflow, while regression demonstrates the power and relevance of deferred tax liabilities in predicting variations of current income tax expenses in agricultural companies.

Implications for Central European audience: In Central Europe, the business environment and influence of the agricultural sector are similar to those in Serbia. Companies apply the same accounting standard for the recognition and evaluation of deferred taxes according to the IAS 12 standard. The results of this paper could be used by managers in all companies in this industry to apply adequate tax planning techniques to satisfy their tax goals and to minimize tax litigation risk.

Keywords: Cash paid for taxes; deferred tax assets; deferred tax liabilities; tax planning; tax expenses

JEL Classification: M41, M48

Introduction

Income taxation policy and its real business implementation are highly important for all economic entities, including agricultural companies. Agriculture is vital for the development of Serbia, which is why many tax concessions support it. Tax concessions vary widely between countries and they include "exempting small farmers from paying taxes, allowing cash-based accounting, providing estimates of taxable income, thereby eliminating the need to keep accounts, reduce annual land and property taxes, reduce the taxes associated with the transfer of land between generations, exempting farmers from being registered for value-added taxes and providing tax concessions for fuel used in agricultural production" (OECD, 2020, p. 7). When we consider the European Union, the most supportive tax system exists in the Netherlands, where investment incentives and favourable loss transfers exist (Van Der Veen et al., 2007). Belgium, France and the United Kingdom are the other countries with favourable tax systems for the operation of agricultural companies (Van Der Veen et al. 2007). In Serbia, agricultural production has been considered of primary importance. The share of the agricultural sector in the Serbian GDP was 7.73% in 2014 and decreased to 6.02% in 2017 (Tomašević, 2020). The general rule is when the country is developed, the percentage of agriculture in GDP is around 2%, and it goes to 40% in less developed countries (Tomašević, 2020, in Božić et al., 2011). According to all those mentioned above, the agricultural industry in Serbia is highly relevant in terms of its GDP share, and considering its favourable tax position, the cash outflow for the income taxes and its prediction could be of paramount importance for tax officials on the one hand and for companies' managers on the other hand. This research evaluates the relevance of current tax expenses and deferred tax assets and liabilities for predicting income tax cash flows. The European Commission (2017) found that the statutory tax rate may give an incomplete picture of the generosity of the tax system because it does not consider the tax base definition. IAS 12, a respective IASB standard applied by agricultural companies in Serbia, which are large, small and medium-sized, gives rise to deferred tax assets and deferred tax liabilities in the balance sheet and current income tax expenses in the income statement.

Income tax expenses and tax allocations in terms of tax assets and liabilities have been calculated using the balance sheet approach since 1996. International Financial Reporting Standard IAS 12 Income taxes (IFRS Foundation, 2019) prescribes a balance sheet approach to income tax allocations. IAS 12 thus raises temporary differences that are deductible and taxable. Brouwer and Naarding (2018) pointed out that IAS 12 implies that this standard focuses on deferred taxes, not so much on the income tax expenses reported in the income statement. IFRS requires agricultural companies to make a balance sheet and report on deferred tax assets and liabilities, an income statement and report on current tax expenses, and a statement of cash flows and report on cash outflow for income taxes. All four variables taken in our research are public data.

IAS 12 is therefore a reconciliation accounting standard that tries to match different principles used in accounting and tax calculations, which give rise to differences in statutory tax rates and effective tax rates for corporations, sometimes used as indicators of tax aggressiveness or tax avoidance. Temporary tax differences and deductible temporary

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differences are the focus of academic research because they could be reversed in the future. This means that deferred tax assets are future deductions, while deferred tax liabilities are future payments for taxes. Therefore, deferred taxes influence future cash flows. We try to evaluate the relevance of those deferred tax asset and liability positions to determine future cash outflows for taxes. Decision-makers rely on the return that they expect from company. Their expectations are based on the ability to assess the amount, timing and uncertainty of future net cash flows. All accounting items, including deferred tax assets and liabilities, should be focused on providing relevant information for decision-makers when determining the amount, timing and uncertainty of future cash flows. Some studies point out that tax accounting is a challenge when decision-makers assess the amount and timing of its influence on cash flows. According to Blaylock et al. (2012), a basic tax-planning strategy is to defer taxes for as long as possible to decrease the net present value of the taxes paid. If we develop this idea further, then deferred tax assets and liabilities could be a result of earnings management, where they reduce the quality of earnings and their persistence, while if book-tax differences are the result of tax planning and IAS 12 implementation, they do not signal lower earnings quality. In Serbia, studies on income taxes are quite rare (Knežević & Pavlović, 2023), especially in the agricultural sector (Vržina & Dimitrijević, 2020; Knežević et al., 2023), although the agricultural sector is considered a very important sector for Serbia, with a significant influence on the entire economy (Pavlović et al., 2019). Studies about the relevance of tax cash flows in an international context are also rare (Seidman & Stomberg, 2019; Ciconte et al., 2016; Laux, 2013).

Brouwer and Naarding (2018) pointed out that financial accounting for deferred taxes is forward-looking and that deferred taxes indicate probable future income tax deductions or burdens and assist financial statement users in assessing the financial position of a firm or group. On the other hand, there is evidence that large amounts of deferred taxes also signal earnings quality (Hanlon, 2005) and lower bond ratings (Crabtree & Maher, 2009) and firms whose book-tax differences arise from upward earnings management (tax avoidance) exhibit lower earnings persistence (Blaylock et al., 2012).

Our paper addresses the relevance of deferred tax assets and liabilities in determining cash outflow for income taxes in the context of Serbian agricultural companies. Managers of agricultural companies could use these results to establish better tax planning to reach the goals of income tax reductions. As pointed out by Donelson et al. (2023), firms usually mimic peers' tax strategies. We assume that firms in this industry, which are derived from a population sharing the same characteristics, should follow similar tax reporting strategies when deferred taxes are in question. Following an aggressive tax planning strategy, firms can be involved in tax litigations, and academic research finds that there is a negative correlation between tax litigation and cash taxes paid. Thus, firms paying higher taxes are rarely exposed to tax litigation. Knowing the tax planning of agricultural companies' managers could improve the assessment of future cash taxes paid and reduce reputational and economic risks. At the same time, policymakers could also use the same results to establish better criteria for tax concessions in this industry and to understand whether agricultural companies apply tax planning techniques and whether those techniques are

efficient in tax payment reductions. Our study contributes to the financial accounting literature that evaluates the relevance of deferred taxes and current tax expenses for determining tax cash flows.

This paper is divided into the following parts: a literature review of taxation in agriculture, data and methodology, research results, discussion and concluding remarks.

1 Literature Review

Using deferred tax assets and liabilities as a methodology to reduce effective tax rates is not new. There are two opposing theories concerning the value relevance of deferred taxes: the liability and equity views (Chludek, 2011). The liability view is followed by the IFRS and US GAAP standards; therefore, it must be explained further. According to the liability view, deferred tax liabilities will result in a future cash outflow for income taxes, while the opposite results from deferred tax assets. Deferred tax assets and liabilities are not material amounts in Serbia (Knežević et al., 2023) and are not material even in German companies (Chludek, 2011), but they influence future firms' cash flows and earnings quality like any other accounting accrual.

Since IAS 12 was issued, deferred tax accounting has been considered a black box for financial statement users and a preparation conundrum for accountants. Brouwer and Naarding (2018) focused on the fact that the IASB did consider users' needs and looked into certain application issues, but insufficiently considered the empirical academic results and insights from a measurement perspective. Morton (2018) pointed out an accounting transition from a novelty – emerging as what "ought" to happen due to the "issue" of a newly introduced and problematic corporate tax – to a taken-for-granted norm in contemporary accounting practice. The purpose of our research is to find out whether there is any evidence that IAS 12 rules help agricultural companies in Serbia assess the impact of the cash outflow for taxes or improve their future cash tax predictions. This is based on the fact that even accounting standards affect deferred taxes, and accounting standard setters such as the IASB (International Accounting Standards Board) and FASB (Financial Accounting Standards Board) have concerns over the costs and complexity of companies' deferred tax disclosures (Mear et al., 2020) The agricultural sector was chosen because it receives many tax subsidies; therefore, it will have higher amounts of deferred taxes reported. Also, as Gerlitz and Dobler (2023) found, most of the studies have been done in the US context and only 12% of all studies have been based on IFRS. There is a need to exploit particularities of other national settings, for example, in the course of the implementation of new financial or tax accounting regulations and code law settings in general (Gorlitz & Dobler, 2023). Serbia, with its IFRS-based regulations in terms of tax accounting, could offer a specific perspective from another national setting. Deferred tax accounting exists in Serbia, but there is a limited number of articles focusing on this topic in Serbia (Vržina et al., 2020; Knežević et al., 2023) and in other countries with a similar background referred to as transition economies (Danescu & Soare, 2022).

Donelson et al. (2023) focused on the relationship between tax litigation and cash flow for taxes and found that they are inversely related. Thus, understanding the possible negative tax litigation results of inappropriate tax planning techniques used by agricultural entity

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managers could be important for them to minimize tax risks for the companies. Donelson et al. (2023) found that most plaintiffs allege that managers (1) exposed the firm to unnecessary costs by using aggressive tax strategies, (2) failed to pay taxes the firm was legally required to pay, and (3) improperly accounted for tax information in their financial statements. Almost 38% of all tax litigation cases are related to tax reporting issues in financial statements (Donelson et al., 2023).

Ciconte et al. (2024) and Ciconte et al. (2016) pointed out that when accounting standards or respective interpretations have been changed such as the implementation of FIN 48 for US companies, it influences income tax reporting and their results suggest that current accounting guidance enables managers and financial statement users to accurately report on and reliably predict future cash obligations, respectively. The purpose of all accounting standards and interpretations is to help managers predict their future tax cash outflows. Although the purpose of accounting interpretations and standards is quite straightforward, namely predicting future income tax payments, FIN 48 failed to do that according to Robinson et al. (2016). The authors found no evidence that FIN 48 increased the ability of tax expenses to predict future tax cash flows. That is why our paper focuses on predicting cash income taxes using the accounting items found in the financial statements as a result of the application of IAS 12 by Serbian agricultural entities. Gorlitz and Dobler (2023) pointed out that there are doubts around whether and to what extent deferred taxes provide relevant information for financial statement users and are employed by firms to manage their earnings, while the US Securities and Exchange Commission and the German Financial Reporting Enforcement Panel consider deferred taxes a key source of potential errors in financial statements. Deferred taxes could be used to manage earnings or to be value-relevant for users in assessing future tax cash flows. The main debate concentrates on the fact that deferred tax items are subject to managerial judgment and estimation. If the item is a subject of judgment, then if it predicts a future cash flow, it is considered to be value-relevant and represents higher earnings quality. If it causes an error to arise that is not relevant, it presumes that the company does not report it in line with the standard or that these items are influenced by managerial discretion or earnings management. The type of relevance applied in our study is so-called forecast relevance (Gorlitz & Dobler, 2023).

Some researchers have found that deferred tax liabilities expected to be reversed in the future have value relevance for investors (Citron, 2001), while Brouwer and Naarding (2018) found that the lack of a clear relationship with the tax cash flows affects the value relevance of deferred taxes. Brouwer and Naarding (2018) investigated whether deferred tax liabilities would result in future tax payments and whether investors consider them when making investing decisions, and found that only deferred tax balances that reverse in the foreseeable future without being replaced are value-relevant for investors. The influence of deferred tax liabilities and their growth will be evident only if new investments in long-lived assets are more significant than reversed temporary differences. Edeigba (2022) found a substantial difference between deferred tax balances before and after the IAS 12 adoption. This means that accounting standards affect deferred taxes associated with the values of assets, liabilities and firm revenues. Chludek (2011) found that deferred taxes are not reflected in the firm value because they are not value-relevant to future tax payments,

but the author found that large net deferred tax assets are most likely to translate into actual cash flow and are considered value-relevant. Kimouche (2022) found that the deferred tax does not affect either the persistence of earnings or their predictive ability in Algeria. Campa et al. (2023) investigated the impact of country-specific factors (Germany and the UK), including the taxation system, on this predictive ability of deferred taxes and found conceptual conformity for deferred tax liabilities in both countries but reported conceptual conformity for deferred tax assets only for German firms. Flagmeier (2022), in the German conservative accounting setting, divided deferred taxes into four categories and indicated that aggregate deferred taxes are value-relevant and that the new split informs about the drivers of this value relevance. Amir et al. (1997) used a valuation model and found that investors do not value deferred tax liabilities derived from depreciation. Mear et al. (2021) found that deferred tax amounts increase the explanatory power (R2) of models where future tax paid or future tax expenses are the dependent variable while the mean out-of-sample forecast error for tax paid is 30%.

Results of studies on the forecast relevance of deferred taxes and their predictive value for the prediction of income tax cash flows are inconclusive. Laux (2013) found that deferred tax assets and liabilities provide incremental information about future tax payments but the magnitude is small and that the largest deferred tax component – depreciation-related deferred tax liability – is not associated with future tax payments. Amir et al. (2001) provided evidence that deferred tax liability arising from depreciation adds value to the analysis. Ojala et al. (2020) found that in small companies opting for a voluntary audit, and assuming that the audit opinion is unqualified, the company can decrease the likelihood of tax adjustment to 26.0%.

Besides the debate on the usefulness of deferred taxes in predicting future income tax cash flows, we use current tax expenses as a predictor of tax cash flow in our forecast relevance study. In this context, research results are more conclusive. Sediman and Stomberg (2019) found that firms paying higher amounts of cash taxes have higher returns, do not use tax avoidance (Robinson & Schmidt, 2013) and if firms show higher differences between current tax expenses and taxes paid, they pay less taxes and use tax avoidance (Blouin & Tuna, 2006). Cash flow for income taxes and current tax expenses are used to determine current tax avoidance. Sikes and Verrecchia (2020) measured aggregate corporate tax avoidance as the sum of cash taxes paid for all US firms in Compustat scaled by the sum of pre-tax income for all US firms in Compustat, with lower values corresponding to greater tax avoidance.

On the other hand, based on Mear et al. (2021) and Laux (2013), we use current tax expenses as the dependent variable in the dataset to see its causality with deferred taxes. The results of Mear et al. (2021) show that the absolute error of tax expenses under tax allocation results in a lower absolute forecast error.

Based on all of the above mentioned, the following hypotheses are developed:

- **Hypothesis 1:** Deferred tax liabilities and assets are good predictors of cash outflow for taxes.

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- **Hypothesis 2:** Agricultural companies' current income tax expenses are a good predictor of cash outflow for income taxes and the expected sign is positive.
- **Hypothesis 3:** Deferred tax liabilities and assets are good predictors of current tax expenses.

2 Data and Methodology

The research sample comprises agricultural and livestock companies (under Eurostat activity codes 011, 012, 013, 014, 015) located in Serbia. The population from which the sample has been drawn uses the following criteria: the company is active, the number of employees is 6–500, all the entities are limited liability companies, the bank account status should be active, the bank account has not had any temporary restrictions placed by tax authorities, top 50 in terms of sales revenue, operating revenue of 1.9 million EUR and higher, profit before taxes higher than 0, we do not include companies with losses).

The PKS Partner database (https://pkspartner.rs/sr/) is used to identify the companies. The sample consists of 50 companies, but there are companies that do not have complete data for the analysis in 2016–2020. We use a five-year period based on Laux (2013), who also examined the information on deferred tax assets and liabilities over five years because many of the deferred tax components are long-term and likely take several years before their tax effect is realized. We choose the years ending in 2020 to eliminate possible COVID-19 effects on the results in this sector or the possibility that results could be jeopardized by government interventions regarding taxes during the health crisis (for example, entities were allowed to postpone tax payments). The COVID-19 measures in Serbia included relief for all taxpayers to which payment of the taxes was delayed pursuant to Article 74 of the Tax Procedure and Tax Administration Law. Those taxpayers were allowed to postpone the payment and the tax authority did not enforce collection of the amounts owed, and interest was not calculated on due amounts. The dependent variable in this study is cash outflow for income taxes, and if we take the financial statements issued after COVID-19 (covering the period 2021–2022), we believe that in those two years, many entities opted for the COVID-19 tax relief measures; therefore, our primary variable in the research will be directly changed due to governmental measures, which in turn will jeopardize the characteristics of the dataset under analysis. We remove loss-incurring firms from the sample because losses are less persistent than profits (Mear et al., 2021). The statutory income tax rate in the period in question did not change and it is 15% annually in Serbia.

Methodologically speaking, descriptive statistics, Pearson and Spearman correlation analysis and panel regression analysis have been considered to define relations between variables used in the research and determine their predictive power.

Variables taken into the analysis are explained in Table 1 below.

Table 1 | Description of variables

Variable	Financial statement presentation	Explanation
Cash outflow for taxes (*co*)	Statement of cash flows	Dependent variable
Current Tax expenses (*cte*)	Income statement	Independent variable
Deferred tax assets (*dta*)	Balance sheet	Independent variable
Deferred tax liabilities (*dtl*)	Balance sheet	Independent variable
Operating revenue (*or*)	Income statement	Independent variable
Profit before taxes (*ptp*)	Income statement	Independent variable

Source: Authors' own elaboration

3 Research Results

The next section of the paper presents a statistical analysis of the dataset.

3.1 Descriptive statistics

The analysis of variables of our importance will be conducted using the following descriptive attributes: mean, minimum, maximum, standard deviation and the number of observations of variables.

Table 2 | Descriptive statistics of current tax expenses and cash taxes paid (EUR)

Variable	N	Mean	Std. dev.	Min	Max
co	137	115,417.77	194,316.18	68	1,440,165
cte	139	130,814.14	227,111.23	705	1,731,695
dta	68	159,512.68	307,052.77	9	1,826,823
dtl	43	258,563.7	693,461.52	340	2,582,064
ptp	150	1,081,000.8	2,025,381.5	0.3	12,394,501
or	150	18,193,038	16,639,921	1,978,808	100,000,000

Source: Authors' own calculations

Descriptive statistics show that the highest cash outflow for taxes was 1,440,165 EUR, with the lowest value being 68 EUR. The maximum value of current tax expenses is 1,731,695 EUR and the lowest is 705 EUR. There is a huge deviation among the sample companies. The deferred tax liabilities have a maximum of EUR 2,582,064 and a minimum of EUR 340. The deferred tax assets have a maximum value of 1,826,823 EUR and a minimum of 9 EUR. Profit before taxes has a minimum of 0.3 EUR and a maximum value of 12,394,501 EUR. Companies in the sample have an average operating revenue of 18,193,038 EUR. The minimum operating revenue is 1,978,808 EUR.

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Table 3 | Number of companies reporting deferred tax assets and deferred tax liabilities

	Deferred tax assets	Deferred tax liabilities
Average	159,512.68	258,563.7
Max	1,826,823	2,582,064
Min	9	340

Source: Authors' own calculations

On average, the deferred tax assets are 159,512.68 EUR, while the deferred tax liabilities are 258,563.7 EUR. The deferred tax liabilities are almost 1.62 times higher than the deferred tax assets.

3.2 Correlation analysis

In the next section, Pearson pairwise correlation and Spearman rank correlation results are presented in order to track whether our variables tend to change together:

Table 4 | Pearson correlation analysis

	co	*cte*	*dta*	*dtl*	*ptp*	*or*
co	1.0000					
cte	0.7768*** 0.0000	1.0000				
dta	0.2392* 0.0611	0.1549 0.2294	1.0000			
dtl	0.6675*** 0.0000	0.7705*** 0.0000	-0.9878* 0.0994	1.0000		
ptp	0.7079* 0.0000	0.9034* 0.0000	0.4814* 0.0000	0.8160* 0.0000	1.0000	
or	0.6531* 0.0000	0.6566* 0.0000	0.4900* 0.0000	0.8264* 0.0000	0.7196* 0.0000	1.0000

Note: *** 0.01, ** 0.05, * 0.1
Source: Authors' own calculations

The Pearson correlation test allowed us to measure linear relationships between continuous random variables. In general, it is widely applied in research and allows direct comparability of findings in different studies. The results show that cash outflow for taxes (*co*) is highly positively correlated with the current tax expenses (*corr.* 0.7768 and *sig.* 0.0000), with the deferred tax liabilities (*dtl*) (*corr*. 0.6675, *sig*. 0.0000), with profit before taxes (*ptp*) (0.7079 at the level of 0.0000) and with the operating revenue (*corr*. 0.6531, *sig*. 0.0000). Cash outflow for income taxes is positively correlated with deferred tax assets (*dta*), but this relationship is not significant (*corr*. 0.2392, *sig*. 0.0611).

If we take current tax expenses as the dependent variable, it shows a positive linear relationship with deferred tax liabilities (*corr*. 0.7705), with profit before taxes (*ptp*) *corr*. 0.9034 and operating revenue (*or*) *corr*. 0.6566

The tests of normality that we conducted (skewness and kurtosis) indicated the need to transform the variables in the model. That is why we resorted to logarithmization. However,

before transforming the model variables, we introduce the Spearman correlation test into the analysis. The main reason is the small sample size, where normality is usually violated. The Spearman test is more robust and faster and avoids the problems of non-linearity of variables. Unlike the Pearson test, here we measured correlations across ranks by evaluating a measure of the monotonic relationship between continuous random variables.

Table 5 | Spearman correlation analysis

	co	***cte***	***dta***	***dtl***	***ptp***	***or***
co	1.0000 137					
cte	0.8254* 134 0.0000	1.0000 139				
dta	0.2109 62 0.0998	0.2558* 62 0.0448	1.0000 68			
dtl	0.4573* 38 0.0039	0.4764* 40 0.0019	-1.0000 3 1.0000	1.0000 43		
ptp	0.7040* 137 0.0000	0.8719* 139 0.0000	0.2728* 68 0.0244	0.5714* 43 0.0001	1.0000 150	
or	0.3540* 137 0.0000	0.3859* 139 0.0000	0.0996 68 0.4191	0.5166* 43 0.0004	0.3830* 150 0.0000	1.0000 150

Note: *** 0.01, ** 0.05, * 0.1
Source: Authors' own calculations

The results of the Spearman test show a positive correlation between the variables. This suggests that there is a positive monotonic relationship between cash outflow for taxes and current tax expenses, as is shown by the Spearman rank correlation of 0.8254, *sig*. 0.0000. Cash outflow for taxes shows a positive monotonic relationship with profit before taxes (*ptp*) with a Spearman rank correlation of 0.7040 and *sig*. 0.0000. Cash outflow for taxes is in a positive monotonic relationship with the deferred tax liabilities (Spearman rank correlation 0.4573, *sig*. 0.0039) and in a positive monotonic relationship with the operating revenue (Spearman rank correlation 0.3540, *sig*. 0.0000).

Current tax expenses show a positive monotonic relationship with deferred tax assets (Spearman rank correlation 0.2558), with deferred tax liabilities (Spearman rank correlation 0.4764), profit before taxes (*ptp*) (Spearman rank correlation 0.8719) and operating revenue (*or*), where the Spearman rank correlation is 0.3859.

The data from Tables 4 and 5 show minimal differences in the results of both Pearson and Spearman tests. This is also the case in most other analyses, where there are no outliers or a skewed picture of variables where significant differences would appear. This suggests that the correlations of both models only confirm the actual relationships between successive variables.

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3.3 Panel data models

A panel linear regression model is applied to estimate parameters for which data on the considered unit are collected over time. Panel data (cross-sectional *x* time series) offer a greater number of observations in the evaluation. Thus, the parameter estimates obtained by panel regression are efficient. In this analysis, a panel model was created that evaluates the impact of deferred taxes on the cash outflow for income taxes and current tax expenses in the agricultural industry of Serbia. The dataset covers the period from 2016 to 2020. We used the widely popular econometric package STATA. It is applied in both simple and complex data analysis.

We used the panel regression models (fixed-effects model – FE and random-effects model – RE) to evaluate the parameters of the model in the analysis. We tested the resulting estimates with several tests to obtain effective estimates. In order to determine which model (FE or RE) is more effective in evaluation, we used the Hausman test. We additionally tested the models using the Breusch-Pagan test (xttest0). High chibar2 test values and high significance yield effective scores (xttest3: modified Wald test for group heteroscedasticity).

Table 6 | Results of OLS and panel regression models

Results for OLS and Panel models										
VARIABLES	OLS	Panel FE	Panel RE	Panel RE	Panel RE	OLS	Panel FE	Panel FE	Panel FE	Panel FE
Dependent	*lco*	*lco*	*lco*	*lco*	*lco*	*lcte*	*lcte*	*lcte*	*lcte*	*lcte*
Independent										
lcte	1.012***	0.634**	1.017*							
	(0.066)	(0.284)	(0.532)							
ldta		-0.373*		0.015			0.026		-0.042	
		(0.187)		(0.103)			(0.102)		(0.100)	
lptp		-0.640*	-0.185	0.041	0.700***		0.635***	0.773***	0.591***	0.820***
		(0.366)	(0.503)	(0.098)	(0.163)		(0.170)	(0.083)	(0.174)	(0.089)
lor		1.260*	0.507	1.515***	0.806**		0.345	0.956***	0.626*	1.158***
		(0.628)	(0.351)	(0.478)	(0.354)		(0.337)	(0.297)	(0.322)	(0.345)
ldtl			0.033		-0.020			0.067		0.045
			(0.107)		(0.111)			(0.078)		(0.101)
lco						0.598***	0.171**	0.030		
						(0.043)	(0.077)	(0.058)		
Constant	-0.480	-5.181	-6.888	-15.020*	-11.548**	4.592***	-4.770	-15.794***	-6.325	-19.274***
	(0.728)	(9.527)	(4.917)	(7.685)	(4.775)	(0.464)	(4.908)	(4.938)	(5.018)	(6.114)
Observations	134	61	38	62	38	134	61	38	62	40
R-squared	.117	.276	.155	.097	.124	.117	.424	.860	.354	.801

Note: *** 0.01, ** 0.05, * 0.1
Source: Authors' own calculations

We developed ten models grouped into two sections. Besides estimating the cash outflow for taxes as a dependent variable, we also use current tax expenses as a predictor of future

current tax expenses, which was also used by Mear et al. (2021). The authors pointed out that deferred taxes increase the explanatory power (*R2*) of regression models where future taxes paid or future tax expenses are the dependent variable. In our models, we use logarithmization of variables. The group of regression models on the left-hand side of the table shaded in grey represents cash outflow for taxes as the dependent variable. Model 1 (the OLS model) shows that when cash outflow for taxes increases by 1%, it causes an increase in current tax expenses of 1.012%, but the explanatory power of the model is very small (*R-squared* 0.117). Random and fixed-effects models show more statistically significant regression results (models 2–5).

Model 2 (panel fixed-effects model) has the best explanatory power (*R squared* 0.276) and it shows the causality between future cash outflow for taxes and current tax expenses, deferred tax assets, profit before taxes and operating revenue of agricultural firms. This model shows that when future cash outflow for taxes increases by 1%, it causes an increase of 0.634% in current tax expenses, an increase in operating revenue of 1.260%, a decrease in deferred tax assets of 0.373% and a decrease in profit before taxes of 0.640%. When a causal relationship is modelled using random effects, the explanatory power of model 3, *R-squared*, is 0.155. An increase in a future cash outflow for taxes for agricultural firms of 1% will cause an increase in current tax expenses of 1.017%, an increase in operating revenue of 0.507% and an increase in deferred tax liabilities of 0.033%, while profit before taxes will decrease by 0.185%. Model 4 has a low explanatory power (*R-squared* of 0.097) and model 5 has an explanatory power of 0.124.

In models 6–10, current tax expenses are taken as the dependent variable. Model 8 (panel fixed-effects model) shows the best explanatory power (*R-squared* 0.860). According to this model, when current tax expenses increase in the future by 1%, this will cause a profit before taxes (*ptp*) increase of 0.773% and an operating revenue increase of 0.956%, while deferred tax liabilities will show a small increase of 0.067% and cash outflow for taxes will show a small increase of 0.030%. Model 10 (panel fixed-effects model) shows good explanatory power with an *R-squared* of 0.801. When current tax expenses increase in the future by 1%, this will cause profit before taxes to increase (0.850) as well as operating revenue (1.158%) and an increase in deferred tax liabilities of 0.045%.

Model 7 (panel fixed-effects model) shows good explanatory power as well (*R-squared* 0.424). This model shows that when future current tax expenses increase by 1%, this will cause other variables to follow: profit before taxes will increase by 0.635%, cash outflow for taxes will increase by 0.171% significantly, while deferred tax assets will increase slightly by 0.026% and operating revenue will increase by 0.345%. The preferred model is model 8.

4 Discussion of Results

Numerous tax concessions support the agriculture industry in many countries, including Serbia. Since it is treated as an industry with many concessions, the expectation is that the larger the company size, the lower the cash taxes because bigger companies use more tax concessions and apply tax planning techniques to lower taxes. The same holds for profitable companies. Dunbar et al. (2010) argued that profitable firms have a greater incentive to reduce taxes relative to unprofitable firms, and Ann and Manurung (2019)

pointed out that if the company has a high-profit level of tax, its aggressiveness is also high because the company wants to pay lower taxes. In our sample, we chose agricultural companies in Serbia based on the earned revenue or sales level as an indicator of size. Based on the size, we assume that those companies in Serbia apply tax planning and lower their taxes. Companies in the sample have a minimum operating revenue of more than 1 million EUR with an average of more than 18 million EUR. All of them are profitable companies with an average profit before taxes of 1.9 million EUR. Therefore, in the business environment of profitable companies, predicting a cash outflow for income taxes becomes an important factor for their managers and policymakers as well. Companies use deferred taxes (assets and liabilities) to influence their future income tax payments.

As the Pearson correlation shows, the most influential relationship is established between cash flow for income taxes and current tax expenses, which is followed by a strong positive relationship with deferred tax liabilities. When current tax expenses are used as the dependent variable, they are positively related to deferred tax liabilities, profit before taxes and operating revenue. The Spearman correlation shows similar results for the variables, but the relationship is monotonic rather than linear.

This is in line with the analyses conducted by Amir et al. (1997) and Chludek (2011), who found that investors do not think that deferred taxes possess relevance when making investment decisions, but they pointed out that deferred tax assets and deferred tax liabilities have only a minor effect on the cash flow for taxes. Our regression model 2 (panel fixed-effects model) shows a very good explanatory power of 0.276. According to the results, causality is established between future cash outflow for taxes and deferred tax assets decrease. Profitable firms with huge amounts of sales revenue will need to decrease their deferred tax assets when paying higher cash income taxes. However, deferred tax assets have a minor effect on cash outflow for taxes. Deferred tax liabilities show no causality with the cash outflow for taxes.

On the other hand, when current tax expenses are taken as a dependent variable, then deferred tax liabilities have a causal relationship with the current tax expenses. The current tax expenses are higher; firms have higher revenue and profit, but there will be an increase in deferred tax liabilities. Hypotheses 1 and 3 are partially supported by our models. Deferred tax assets are a good predictor of cash outflow for taxes, while deferred tax liabilities can be used as a predictor of current tax expenses.

It does not seem realistic that deferred tax liabilities will be transformed into future tax payments when used as a book-tax difference arising from the IAS 12 standard in Serbia, but they will predict future current tax expenses in the income statement.

On the other hand, we predict that deferred tax assets will negatively affect future tax flows and that they can explain the variability of the dependent variable. It does happen as predicted and results of model 2 support this hypothesis.

Hanlon and Heitzman (2010) explained that accounting research in this area helps understand how managers balance tax incentives with external reporting incentives. Each industry seems to use different tax optimization strategies as allowed by accounting

standards. Data show the above-presented correlations for the Serbian agriculture industry over a five-year period. In profitable companies, cash outflow for taxes will be predicted when the balance of deferred tax assets goes down, and current tax expenses will be predicted with an increase in deferred tax liabilities.

This situation could be explained by Chludek's (2011) results. The author found that there is uncertainty concerning the timing of the tax cash flows arising from temporary differences in tax assets and tax liabilities, and there is another uncertainty, namely, the uncertainty of realization of those tax payments and benefits connected to tax liabilities and assets. The firm's future regular operations directly influence whether those benefits or payments will be realized through cash flow for taxes (Chludek, 2011). Obviously, in our analysis, the probable future realization of deferred tax assets and liabilities is quite uncertain, and it depends on the industry or the tax optimization policies used by the companies in the specific period of time. Mear et al. (2021) found that the explanatory power of deferred taxes for current tax expenses and tax payments is higher than without those variables.

Current tax expenses are a good predictor of future tax payments (models 2 and 3). This also aligns with other findings (Seidman & Stomberg, 2019). Therefore, our research fully supports Hypothesis 2.

In conclusion, several pieces of conclusive evidence can be found. Firstly, current tax expenses are a strong predictor of cash outflow for taxes. However, the current tax expenses depend on the amount of profit calculated using accounting standards and accrual basis, while cash taxes paid are based on the cash basis. The higher the current tax expenses, the higher the amount of cash taxes paid. Secondly, deferred tax assets predict the future cash outflow for taxes and deferred tax liabilities have the explanatory power to predict future current tax expenses, but not in isolation from other variables in the research.

Conclusion

The overall usefulness of deferred taxes in the agricultural sector is still debated, but our analysis does reveal some conclusive evidence on how they influence income tax cash flows and current tax expense predictions. Chludek (2011) believed that the lack of cash flow implications of deferred taxes is due to their value irrelevance and found that 70% of account balances persist over time and do not reverse.

Our results regarding the use of deferred taxes and current tax expenses as predictors of cash outflow for income taxes are contingent on the quality of the proxies used in our analysis. Despite these limitations, our paper makes several contributions to the literature. Firstly, unlike prior research, we provide a correlation analysis of possible factors influencing cash income taxes and current tax expenses across a sample of agricultural companies. Unlike previous research focusing on effective tax rates in agricultural companies in Serbia, our question was to determine and predict future cash flow for taxes and current tax expenses using possible factors such as deferred taxes. We show that if current tax expenses increase, it will lead to an increase in cash taxes paid by the agricultural companies. Therefore, tax expenses are a good predictor of future taxes being paid.

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The main limitation of our study is that it used a sample of small, medium-sized and large Serbian agricultural companies and not all agricultural companies in the industry. Future researchers could test these results on a sample of all entities or align our results with the post-COVID-19 pandemic results, which offers a different setting to investigate deferred taxes in this specific context influenced by an external health crisis. Also, future research could divide the sample into growth firms and non-growth firms because we expect that growth could be important because where asset growth exists, cash outflows related to tax are postponed into the future.

Policymakers and managers could use our results as well. Policymakers can use the results to see how current tax expenses and deferred tax assets influence cash taxes paid when determining tax concessions in this industry. On the other hand, managers could use those results when implementing tax optimization policies to check in real-life situations whether deferred tax assets/liabilities have a real influence on cash taxes paid and current tax expenses. With our results, financial accounting literature gains by having one additional paper whose findings align with other researchers, pointing out that deferred taxes have at least some value relevance for investors because of their influence on cash taxes paid.

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