

Anna LESZCZYŁOWSKA*

Provisions for Future Liabilities and Effective Corporate Income Tax Rate

Abstract: The paper quantifies the impact of timing differences that emerge in the case of discrepancies between accounting and tax rules on the corporate tax burden. The objective of the paper is to investigate the effect of the accelerated deductibility of company expenses via provisions for future liabilities on the multi-period effective average corporate tax rate (EATR).

In the investigation, pension provisions and so-called “other provisions” are taken into account and a multi-period backward-looking measure of the tax burden based on corporate cash flows is developed. The investigated companies are divided into several subgroups according to their size and multi-period cash flow. Under the current tax law, the highest tax burden among companies with positive cash flows is observed for medium-sized firms, at 33%. For small and large enterprises, the burden takes values of 24% and 25% respectively. A different situation is observed among firms with negative cash flows: in general, the EATRs are noticeably higher in this case. Under the current tax law, the average effective tax rates are 60% for all firms and 38%, 45% and 51% for medium-sized, small and large corporations respectively.

If changes are made to the ways provisions for future payments are treated under tax regulations, a slight reduction may be observed in the multi-period average effective tax burden. In general, the timing effects of the deductibility of provisions lead to an average change in the effective tax rate from –1 percentage point (in the case of small companies with positive cash flows) to –4 percentage points (in the case of small entities with negative cash flows and medium-sized entities with positive cash flows). Although the differences in the median tax burden may seem to be slight, they are statistically significant.

Keywords: corporate income tax, EATR, provisions, tax accounting

JEL classification codes: H25, H32, K34, M41

* Uniwersytet Ekonomiczny w Poznaniu, Wydział Zarządzania, Katedra Finansów Przedsiębiorstw;
e-mail: anna.leszczyłowska@ue.poznan.pl

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Introduction

The level of conformity between financial accounting and tax accounting rules varies strongly across jurisdictions. One field in which differences are particularly evident are provisions for future obligations. They reflect liabilities that are uncertain in timing or in amount. From a business perspective, creating provisions for future obligations is necessary to account for possible risks emerging from the enterprise's activities and changing economic environment. Being recognized both in the balance sheet and, correspondingly, as costs in the profit and loss account, they are an important instrument of the accounting policy. As an example, creating provisions influences the amount of expenses and firm's profitability.

For tax purposes, a question regarding the timing of business costs arises. It is connected with the fact that provisions can either be treated as deductible expenses or their recognition can be disallowed. The main reason for the diverse treatment of provisions in financial and tax reporting is connected with different purposes underlying both systems. While financial statements should provide a true and fair view of a business, take into account uncertain liabilities and not overstate the income, fiscal regulations are more cash-flow oriented and they rather aim at preserving the taxable base. If provisions are deductible for tax purposes the taxable income is lowered before the actual payment is made. This, in turn, can be recognized as a positive timing effect and lead to a tax advantage.

No type of provisions is accepted by the Polish tax law. Admittedly, the majority of expenses for which provisions are created, are deductible for income tax purposes in Poland but only later, in periods in which these expenses become effective. However, this situation may become subject to far-reaching changes in case there is a further development of the harmonization concept of the corporate income tax bases across the EU. The proposal of a directive of a common European corporate tax base (CCCTB) allows to deduct provisions for future obligations against taxable earnings [Proposal for a Council Directive, 2011].

In this context, it should be investigated what are the possible effects of tax-effective deduction of provisions from the perspective of taxpayers. It is interesting to quantify the effects of the emerging timing differences between the accounting and the tax rules on the corporate tax burden.

The objective of the paper is to investigate the effects of the accelerated deductibility of company's expenses, which occurs via provisions for future liabilities, on the multi-period effective average corporate tax rate (EATR). In the investigation, pension provisions and the so called 'other provisions' are taken into account and a multi-period measure of the tax burden based on corporate's cash flow is developed.

The empirical literature on the potential effects of the deductibility of provisions, as well as of other detailed changes in the design of the corporate tax base which are motivated by the CCCTB proposal, is scarce. Research on this harmonization concept was encouraged by the development of the project of the European Commission and the discussion about possible reform options (e.g. Devereux [2004]). However, the vast majority of research has been concentrated on the consolidation and apportionment of tax base between jurisdictions, rather disregarding detailed regulations on the issues connected with the shape of that base. For instance, McLure and Weiner [2000] assessed the consequences of different allocation factors. Fuest et al. [2007] as well as Devereux and Loretz [2008] analyzed the effects of formula apportionment on the size of the tax base. Oestreicher and Koch [2011] investigated the key elements that factor into the tax-revenue consequences for different EU member states. As far as the detailed shape of the tax base is concerned, Spengel and Zöllkau [2012] provided an in-depth legal analysis of the differences between the tax base determined under the rules in the proposed Council's directive and current national tax practices in different EU member states. Oestreicher et al. [2009] implemented a model firm approach to assess the consequences which an adoption of a CCTB (a common corporate tax base without international consolidation and apportionment) would have on effective tax burdens of companies located in different EU member states. This research was further developed in Spengel et al. [2012], after the proposal of the directive was released. Leszczyłowska [2013] analyzed the effects of selected CCTB regulations on the tax burden of a group of Polish public companies with static microsimulation. Oestreicher et al. [2014] investigated the effects of the detailed common rules governing depreciation, pension provisions, other provisions and loss offset on tax base in Germany. Using a multi-period microsimulation approach, they discussed changes in the overall tax burden caused by corporate income tax, solidarity surcharge and industrial tax. Additionally, they simulated the consequences in case the common tax base is optional as well as the effects of that concept on compliance costs. Leszczyłowska [2015] concentrated on the tax advantage caused by the accelerated deduction of provisions under the CCTB proposal from the perspective of Polish taxpayers. She examined empirically the scale and the distributional effects of these tax advantages.

The present paper extends this research by an in-depth analysis of the consequences of the deduction of provisions for the effective corporate tax rates (ETRs). They are a well-established measure of corporate tax burden. The detailed definition of ETRs (e.g. the economic items these rates are based on, the period they apply to as well as the choice between marginal and average effective corporate tax rates) poses an important aspect of the research design. The method of calculating the effective corporate tax rate implemented in the paper uses a dynamic, long-term approach which is appropriate to trace the development of provisions over time. To the best of author's knowledge, it is for the first time applied in the Polish setting. Moreover, this measure is

based on periodical cash flows in order to analyze the amounts of taxes due in relation to an important financial characteristic of businesses.

The paper contributes to the existing literature on the economic effects of modifications of the tax base in many aspects. It provides an original empirical analysis of accelerated deductibility of particular expenses in Poland – a country with large book-tax differences, characterized by diverse treatment of provisions for accounting and tax purposes. Provisions are an important structural element of the tax base which may provide a stimulus for choosing the system by the taxpayers if the common tax base is optional. In this context, the results of the paper are relevant also for other European countries in which provisions are treated in similar way for tax purposes as in Poland.

Moreover, the paper contributes with respect to the research method used. Microsimulation is an appropriate instrument for *ex ante* analyses of tax reform policy, however, it has not been widely used in the analyses of corporate income tax so far. The microsimulation approach implemented in the paper allows to observe the scale of the tax advantages at the level of single tax payers. A multi-period assessment on a single entity level is necessary for capturing timing effects of provisions. The simulation is based on single financial statements from a period of 6 years (the latest accessible data for the period 2007–2012). At this stage of research, a sample of 250 companies with business activity located in Poland, randomly selected from InfoCredit database, is used.

Bearing in mind these aspects, the research question posed in the paper contributes to a better understanding of the problem of tax-effective deductions and it enables to close the existing research gaps.

The paper is structured as follows. The first section gives an overview over provisions for future liabilities according to the current Polish accounting rules. The next two sections provide an insight into the research methodology – both the microsimulation, with a description of the underlying empirical data, as well as the multi-period effective tax rate approach. According to the latter, different methods of calculating effective corporate tax rates are discussed. In the next section the results are presented, followed by conclusions.

Types of Provisions in Accordance with the Accounting Rules

The Polish accounting act mentions several categories of provisions. The main two groups are: provisions for employee benefits and other provisions. The former embraces i.a.: pension provisions established for future retirement severance pays as well as jubilee benefits. The latter contains: provisions for contingent losses, guarantee provisions, provisions for deferred repair and maintenance as well as for company's restructuring¹. Both types of provisions

¹ Due to some inconsistencies in the accounting act it cannot be excluded that some provisions may also be recognized as accruals on the passive side of the balance sheet. However, since there is

can be recognized either as long-term (with the maturity of over one year) or as short term items.

Table 1. Companies Reporting^a Different Categories of Provisions in the Research Sample

Category of Provisions	Number of Firms	Share of Firms (%)
Provisions total ^b	182	83
Pension provisions	161	74
Other provisions	158	72

^a Provisions reported in at least one year within the analyzed period.

^b Pension provisions plus 'other provisions'.

Source: own calculation.

The deductibility of provisions against taxable earnings may exert different effects on firm's tax burden, depending on the role provisions play in the individual financial statements. Table 1 presents the number and share of the investigated companies reporting different categories of provisions in their balance sheets.

According to the structure of provisions table 2 reveals that pension provisions have the greatest share in total provisions which amounts to 55%. The share of 'other provisions' in the total amount is 45%. It is evident that the both categories of provisions have different time structures. While in the group of pension provisions long-term positions predominate, reaching a share of 77%, short term items constitute 78% of 'other provisions'.

Table 2. Structure^a of Provisions within the Group of Analyzed Companies

Ratio	Share (%)
Provisions total ^b / Debt	7
Pension provisions/ Provisions total ^b	55
Long-term pension provisions/ Pension provisions	77
Short-term pension provisions/ Pension provisions	23
Other provisions/ Provisions total ^b	45
Long-term other provisions/ Other provisions	22
Short-term other provisions/ Other provisions	78

^a Average ratios for the entire group of the analyzed companies within the analyzed period.

^b Pension provisions plus 'other provisions'.

Source: own calculation.

no possibility to obtain any reliable company-level information about the detailed structure of the accruals this question has to be neglected in further analysis.

Research Methodology of Microsimulation

The amount of business profit established in line with commercial accounting rules may not move close to the taxable income. This is especially the case of Poland which is known of its far-reaching book-tax differences. However, since tax returns of companies subject to the corporate income tax are not accessible it becomes necessary to adjust the information from the financial statements in order to determine the amount of the tax due. The amount of corporate income tax as stated in profit and loss account can be used to calculate the taxable base. However, it has to be proved whether this position consists of the annual tax due only or it embraces also deferred tax. Relying exclusively on the information on the income tax as given in the profit and loss account, without proving whether a deferred tax is reported or not, would lead to distorted results which would not reflect the real annual tax burden. For this reason, information on deferred tax assets and liabilities has to be utilized in order to derive the tax due, according to the methodology proposed in Leszczyłowska [2014]. The deferred tax approach is applied in order to determine the amounts of taxes due. It allows to correct the total tax expense using the information on deferred tax assets and liabilities in order to derive the current tax expense. It is a reasonable alternative for adjusting different accounting profit figures and it works well in a country setting characterized by the considerable book-tax differences.

In a further step, after the annual changes in provisions (increases and decreases) are identified, the initial periodical tax bases of companies have to be corrected by new provisions made and old provisions released in every year. The taxable income has to be lowered in an earlier point in time compared with the current tax law. In order to do that, it is necessary to trace back the development of these financial items over time. The microsimulation implemented in this paper uses financial information for five consecutive years. The multi-period perspective applied is appropriate to cover the timing effects of tax regulations on provisions. Such an approach was implemented e.g. by Reister [2009], Finke et al. [2012] and Oestreicher et al. [2014]. By contrast, looking at a single period only could be misleading since the opposite changes in the tax base to which it comes within a period of several years (a deduction in period t leads to an increase of the tax base in period $t+n$) would not be taken into account. The simulation is static since it does not capture behavioral responses to changes in tax.

Stock figures need to be transformed into flow figures. If there is a decrease of provisions during a particular period it has to be decided whether it is connected with provisions created before the reform came into force. Reversal of such provisions should not be accounted for in the simulation of the tax base. The procedure is based on that implemented by Reister et al. [2008] and Reister [2009] who applied the methodology of investment vintages to explain the composition of provisions for warranty obligations and contingent liabilities. However, the model implemented in this paper

is first and foremost based on the information on the time structure of provisions as given in firm's balance sheet. A simplifying assumption is made that the vast majority of expenses for which provisions are created (80%) is allowed to be deducted for the income tax purposes. It is also assumed, based on legal requirements, that 'other provisions' (in which guarantee provisions are expected to predominate) are created for 2 years and that the discounting of provisions can be neglected. Possible tax losses are carried forward in line with the current corporate income tax regulations. According to them, the loss carry forward is restricted to five years and, additionally, a maximum of 50% of the initial loss can be deducted each year. Then, the firm-specific taxes due are derived and changes in the individual annual tax liabilities are analyzed.

The tax due for every firm-year observation, for the reference and the reform scenario, is calculated using the Polish nominal corporate tax rate of 19% for the entire period. In order to cover the timing effects the future value of the annual taxes for the end of the last observed year is calculated using the annual percentage rate which is derived from Polish treasury bonds. Then, individual EATRs for different cross-sections of enterprises (according to their size and liquidity situation) and for the both scenarios are calculated. The outcomes for every subgroup of entities before and after the reform are tested for differences. Since the Shapiro-Wilk test allows to reject the null hypothesis assuming normal distribution, non-parametric Wilcoxon's signed-rank test is implemented.

In an ideal case it would be advisable to combine data on tax bases and taxes due of single tax payers with their financial statements. However, it is impossible since tax returns are not publicly available. For this reason the analysis is based exclusively on the information obtained from single financial statements. This enables to adjust some financial items in order to derive tax-relevant information, as described in previous paragraphs. Moreover, the use of financial accounting records allows to trace the development of different kinds of provisions over time.

The calculations are based on the data on corporations carrying out the economic activity in Poland. The information is derived from the InfoCredit database, which provides detailed financial information on the entire population of companies in Poland. A prerequisite for data collection was that the financial statements are available for six consecutive years. Initially, a panel of 250 firms was derived randomly from the entire population. It includes joint-stock and limited liability companies, all of which are subject to the corporate income tax. The data set was assessed for differences in totals and subtotals. Firms with missing, erroneous or implausible data which could not be imputed or corrected were excluded. Finally, data on 218 corporations is utilized in the analysis. The simulation covers a period of 5 years (2008–2012). However, also data on 2007 is used since it enables to calculate changes in some items of the balance sheets necessary in the investigation.

Companies are divided into three groups according to their size measured with the annual sales net of VAT and financial revenues: small, medium and large². It is thinkable that some differences between those groups can emerge as a consequence of the diverse role provisions play in their financial statements as well as to the potential various levels of profitability, which in turn is decisive for tax-effective deductions. Moreover, carrying out the analysis for different cross-sections of companies according to their size is a common approach in microsimulation studies and was implemented e.g. in Petersen et al. [2003], Reister [2009] and Finke et al. [2013]. It allows policy makers to take a closer look at possible implications of tax reforms with a particular focus on small and medium sized enterprises – entities which are often subject to special initiatives within the economic policy. In this context, it is possible to check whether such entities become better-off in relation to the other. Table 3 presents the structure of the analyzed firms.

Table 3. Structure of Analyzed Companies According to Size

	All Companies	Small	Medium	Large
	Firms with CF>0			
Number	152	43	65	44
<i>% of the total sample</i>	70	20	30	20
	Firms with CF<0			
Number	66	15	38	13
<i>% of the total sample</i>	30	7	17	6
Total	218	58	103	57

Source: own calculation.

Effective Corporate Income Tax Rate

For the purpose of the paper, it is necessary to develop an appropriate measure of corporate tax burden. A statutory tax rate is insufficient for this purpose since it is common for the entire group of the investigated firms and it does not cover the items determining individual tax bases. As a consequence, a measure of an effective corporate tax rate has to be found. Nicodème [2001] distinguishes three different methodologies to compute effective corporate tax rates: macro backward-looking, micro-forward-looking and micro backward-looking approaches.

² This criterion is derived from articles 105–106 of the Polish law on freedom of the economic activity (Ustawa o swobodzie działalności gospodarczej). According to it, a small company is an entity which employs on average up to 50 people a year and the sum of its net sales plus financial revenues or its balance sheet total do not exceed 10 million EUR. Limits for medium enterprises are: 250 employees, 50 million EUR and 43 million EUR respectively. The above mentioned limits were converted into PLN based on average exchange rates provided by the Polish Central Bank [Narodowy Bank Polski].

The distinction between macro and micro approaches depends on the level of aggregation of the data used. Macro measures are based on macroeconomic, highly aggregated information, as provided e.g. in national accounts. They are computed as ratios of aggregated taxes paid by companies and an aggregated measure of corporate profits (as, for instance, gross operating surplus or gross profit). In turn, micro approaches use elements of financial statements, either with a theoretical perspective or with empirical data. Bearing in mind this background, macroeconomic effective tax rates have to be put aside from the perspective of research presented in the paper.

The further distinction between forward-looking and backward-looking methodologies is based on the type of the underlying information [Nicodème, 2001]. While the former use statutory features of the tax system to assess the tax aspects of particular corporate decisions, the latter implement ex-post real-life data.

The forward-looking approach is applied to a hypothetical investment or to model firms, which are characterized by an industry-specific mix of assets and liabilities. Then, different assumptions are made according to the investment (type of assets, depreciation schemes) and financial policies (sources of financing) of these entities. As Fullerton [2008] points out, the general idea behind this concept is to incorporate the relevant determinants of the tax code into a neoclassical investment model. Under this approach, both effective marginal (EMTRs) and effective average tax rates (EATRs) can be derived. The EMTR applies to a new additional investment for which the marginal return on the last unit invested just equals the marginal cost of the project. The EATR is based on the distribution of tax rates for an investment project over a range of different levels of profitability [Nicodème, 2001]. The forward-looking methodology is particularly attractive for international comparisons³. However, as it uses a model-firm approach and takes into account only selected rules determining the tax base, it is first and foremost applicable in research on tax incentives considering location, investment and capital structure choices and the obtained results cannot be generalised [Reister et al., 2008].

Bearing in mind the aim of the investigation presented in the paper as well as the underlying empirical data, a measure based on the backward-looking approach has to be selected. As Nicodème [2001] points out, the fact that it uses real-life data allows all elements of the tax code to be taken into account. Moreover, it is appropriate for studying effective taxation across industries and different company sizes. Backward-looking effective average corporate tax rates are calculated as ratios of the individual tax liability and a pre-tax investor's objective variable [Reister et al., 2008]. A wide range of such variables can be chosen. Besides e.g. net operating profit, gross profit, net present

³ The methodology of computing effective tax rates, which was initially proposed by King and Fullerton and further developed by Devereux and Griffith in late 90ties of the 20th century, is currently often implemented among others for tax comparisons carried out for the European Commission. See e.g. Eurostat [2015].

value, it is also thinkable to put the tax due into relation with sales or the economic value added. The denominator can also be defined as the overall remuneration for all production factors i.a.: wages, dividends and retained earnings [Sobiech, 2004]. However, as Finke et al. [2013] point out, cash flow, relative to other financial items, is more closely associated with the firm's value for the owners and, as such, it can be seen as a variable crucial for the investors. Another aspect worth to be mentioned is that if one puts two cash flow-based items into relation (corporate tax due and periodical cash flow) it allows the EATR to be more consistent.

The last crucial thing is that a measure based on one period only would be insufficient in the context of the presented investigation. Since there can be significant year-to-year variation in annual financial outcomes such a measure could not capture the real picture of companies. Since we strive to observe the timing differences in taxation, which are induced by the accelerated deduction of expenses when provisions are made, a multi-period measure is appropriate.

The idea of a long-run effective corporate tax rate is used in Dyreng et al. [2008]. Besides the multi-period perspective, the effective average tax rate implemented in the following research is based on corporate cash flows, as proposed e.g. in Oestreicher and Koch [2008], Oestreicher et al. [2008] and Finke et al. [2013]. The value of firm's taxes due at the end of the last observed year is scaled on the future value of its cash flows. In this way, the measure presents a multi-period tax ratio.

The cash flows in the denominator represent the financial outcome of business activity, which reflects the long-period liquidity. Moreover, cash flows are a financial item which is crucial to the capital owners. The EATR in the reference scenario as well as in the CCTB scenario are calculated with formula (1).

$$EATR_n = \frac{FV_n^{Tax}}{FV_n^{CF}} = \frac{\sum Tax_{n,t} \cdot (1+r_t)^t}{\sum CF_{n,t} \cdot (1+r_t)^t} \quad (1)$$

$EATR_n$ – effective average tax rate of company n ,

FV_n^{Tax} – future value of periodical taxes due of company n at the end of the last observed period,

FV_n^{CF} – future value of periodical pretax cash flows of company n at the end of the last observed period,

$Tax_{n,t}$ – tax due of company n for period t ,

$CF_{n,t}$ – cash flow before tax of company n for period t ,

r_t – percentage rate for period t .

The cash flows in the denominator should be understood as cash flows to equity adjusted in line with tax regulations. In other words, they reflect the sum of operating cash flows, investment cash flows without tax free dividends and interest expenses. The amount of the cash flows for the reference scenario as well as for the scenario with the deduction of provisions is constant.

It cannot be excluded that the sum of the periodical cash flows of single companies is negative. The problem of negative denominators has been solved in different ways in literature. Some authors, as e.g. Dyreng et al. [2008], treat negative ETRs as undefined because they might obscure the results. However, this leads to loss of data. Another possibility presented in Finke et al. [2013] is to take the absolute values of ETRs. In the following investigation another approach is proposed. Firms with negative cash flow in denominator are analyzed separately since taking the absolute value of cash flow would not represent the real picture of them. In this case, the corporations pay the income tax despite the fact that they do not produce any additional liquid funds over a certain period. Their financial situation after taxation is worse than that of companies with positive cash flows.

When calculating average effective tax rates, the sample is controlled for outliers using the tolerance interval of 5 times the average deviation from median (MAD). In consequence, further fifteen entities are removed from the investigated group.

Empirical Results

This section deals with the effects of the deductibility of provisions on the average corporate income tax rates. The results are presented for various company sizes and liquidity statuses. The former gives insight into the question whether there are any significant differences in the reaction to the tax reform measure among small, medium and large firms. The latter allows to understand what is the relationship between the future value of corporate's taxes due and its periodical cash flows before tax.

Companies characterized by sound liquidity and those with lacking funds are analyzed separately since the applied EATR measure, which is based on cash flow, has to be interpreted in a different way. In case of positive values of the annual cash flow, the EATR represents its percentage cut caused by taxation. In opposite cases, the EATR is scaled on the absolute value of negative cash flow. Such companies pay the income tax despite the fact that their money outflows exceed inflows. From that perspective, their tax burden has to be seen even as higher than in case of firms with the same absolute, but positive, amounts of cash flows.

Table 4 displays the multi-period effective average corporate tax rates calculated with formula (1). Under the current tax law and among companies with positive cash flows, the highest tax burden is observed for medium-size firms and it amounts to 33,1%. That is higher than for all companies taken together (30,5%). For small and large enterprises it takes the values of 24,8% and 25,2% respectively. These results present the share by which positive cash flow before taxation is cut by the tax due on average. A relatively low tax burden on large companies is caused by the fact that their cash flows outweigh those of small and medium entities by far (on average, positive cash flow of

large corporations is 14 and 9 times higher than that of small and medium enterprises respectively).

A different situation is observed within the group of firms with negative cash flows. In general, the EATRs are noticeably higher compared to the corresponding groups of companies reporting liquid funds. This is caused by lower absolute values of cash flows in the denominator. At the same time, it proves the initial intuition according to which firms with diverse liquidity status should be analyzed separately. Under the current tax law, the average effective tax rates amount to 59,6% for all firms, 37,9%, 45,2% and 50,5% for medium, small and large corporations respectively. Contrary to the group of companies with positive cash flows, large firms represent the highest tax burden among companies with negative cash flows.

Table 4. Effective Average Corporate Tax Rates According to Firm's Size and Liquidity Status (Current Tax Law, Deductibility of Provisions and Differences)^a

Legal Status	Average	Median	Std.d.	Min	Max	Average	Median	Std.d.	Min	Max
	CF > 0					CF < 0				
All companies										
Current tax law	0,305	0,226	0,278	0	1,580	0,596	0,222	1,251	0	9,417
Deductibility of provisions ^b (Δ in percentage points)	0,281 (-0,02)	0,221 ***	0,247	0	1,413	0,564 (-0,03)	0,222 ***	1,171	0	8,689
Small										
Current tax law	0,248	0,224	0,200	0	0,944	0,452	0,280	0,493	0	1,534
Deductibility of provisions ^b (Δ in percentage points)	0,240 (-0,01)	0,222 ***	0,196	0	0,944	0,417 (-0,04)	0,243 ***	0,487	0	1,534
Medium										
Current tax law	0,331	0,247	0,295	0,01	1,422	0,379	0,211	0,466	0	1,849
Deductibility of provisions ^b (Δ in percentage points)	0,295 (-0,04)	0,229 ***	0,240	0,01	1,233	0,361 (-0,02)	0,210 ***	0,449	0	1,703
Large										
Current tax law	0,252	0,215	0,171	0,01	0,899	0,505	0,219	0,592	0,02	1,919
Deductibility of provisions ^b (Δ in percentage points)	0,234 (-0,02)	0,199 ***	0,165	0,01	0,866	0,488 (-0,02)	0,218 ***	0,597	0	1,919

Significance level *** 0,01, ** 0,05, * 0,1.

^a Results are corrected for outliers using the median average deviation with the interval of 5 times MAD.

^b Other rules determining the tax base unchanged.

Source: own calculation.

The variation of EATRs is relatively higher for companies with negative cash flows compared to those with sound liquidity. The coefficients of variation (untabulated), which are defined as the ratio of the standard deviation to the mean (both presented in table 4), are higher for the former. The minimum values of zero predominate among the subgroups of companies with the exception of medium and large companies. The reason is that in almost every subgroup of enterprises there are firms which do not pay any corporate income tax in the reference scenario.

Provided changes in the treatment of provisions for future payments are implemented to the tax law, a slight reduction in the average effective tax burden is observed. In general, the timing effects of the deductibility of provisions induce an average change in the effective tax rate of from -1 (small companies with positive cash flows) to -4 percentage points (small entities with negative cash flows and medium entities with positive cash flows). The differences in the median tax burden in the investigated subgroups of enterprises are even slighter, however they are statistically significant at the level of 1%.

The above described results extend those obtained in Leszczyłowska [2015]. Analyzing the distribution of the changes in corporate income tax, she observed that the reduction in the multi-period tax due induced by the deductibility of provisions ranges from 1% for the median company in the group of firms with positive cash flow to 2% for the median company in the group of firms with negative cash flow. While altogether 18% enterprises with lacking funds experience a reduction in tax of at least 20%, such a strong reduction applies for merely 6% of the corresponding group of firms with positive cash flows. Her results suggest that positive effects induced by the deductibility of provisions are larger for companies with liquidity problems. The present research, which takes a more in-depth look at various cross-sections of companies, can support this conclusion for the investigated companies as a whole and for the subgroup of small enterprises. This effect is desirable since the economically weaker entities, which face (at least temporary) negative cash flow, are not worse off provided the tax reform is introduced. What is more, an accelerated deduction of provisions can be especially beneficial to them since it generates some additional funds.

Conclusion

The research problem of the paper was devoted to the effects which emerge when it comes to a modification of the moment of the tax-effective deduction of particular business expenses. In such situations, timing effects can be recognized. The aim of the paper was to investigate the effects of the accelerated deductibility of company's expenses on the effective average corporate tax rate (EATR). This tax rate was measured in a multi-period setting in order to cover the timing differences. Different types of provisions created according to the current accounting rules in Poland (pension provisions and other provisions) were analyzed. The development of provisions over time was

modeled and, in accordance to that, the long-term definition of the effective tax burden was applied.

The results show that the timing effects caused by the deductibility of provisions lead to a slight, but noticeable, tax advantage for the taxpayers. It ranges from 1 to 4 percentage points, depending on company's size and liquidity status. The reduction in the tax burden is greater in some groups of corporations with negative cash flows compared with those with sound liquidity. This should be judged positively since the CCTB creates an advantage to firms facing financial problems. However, companies with positive cash flows prevail so from the perspective of the majority of taxpayers it could be expected that they will be clearly better off. It is not the case for small firms which face a reduction of only 1 percentage point.

The results allow for a better understanding of the possible consequences of a detailed modification of the tax base which leads to timing differences in taxation. The effects of such differences are expected to be moderate. However, cumulated over a longer period of time they can lead to considerable tax advantages. This, in turn, is particularly important from the perspective of taxpayers who search for funds to finance their business activities. It is also worth stressing that such differences in timing of business expenses are typical not only for provisions but also for other financial items, as for instance in case of diverse depreciation schemes in financial accounting and tax accounting systems. Identifying such effects is a necessary element of any tax reform.

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REZERWY NA ZOBOWIĄZANIA A EFEKTYWNA STOPA PODATKU DOCHODOWEGO OD PRZEDSIĘBIORSTW

Streszczenie

Przedmiotem artykułu jest kwantyfikacja wpływu, jaki różnice przejściowe, występujące na gruncie przepisów rachunkowych i podatkowych, wywierają na podatkowe obciążenia przedsiębiorstw. Celem artykułu jest zbadanie, jakie skutki dla wielookresowej, efektywnej przeciętnej stopy podatku dochodowego (EATR) ma przyspieszone odliczanie niektórych kosztów poprzez tworzenie rezerw na przyszłe zobowiązania. W badaniu uwzględniono rezerwy na świadczenia emerytalne i inne rezerwy. Zastosowano dynamiczny miernik obciążeń podatkowy typu *backward-looking*, oparty na danych historycznych i odnoszący się do przepływów pieniężnych. Badane przedsiębiorstwa zostały podzielone na kilka podgrup w zależności od ich wielkości oraz wartości przepływów pieniężnych. W obecnej sytuacji i w odniesieniu do firm charakteryzujących się dodatnimi przepływami, najwyższe obciążenie w wysokości 33% jest ponoszone przez średnie podmioty. Dla małych i dużych jednostek kształtuje się ono na poziomie, odpowiednio, 24% i 25%. Odmienna sytuacja występuje w grupie przedsiębiorstw z ujemnymi przepływami: ich obciążenia są, ogólnie biorąc, wyraźnie wyższe. EATR wynosi 60% dla wszystkich podmiotów oraz 38%, 45% i 51% odpowiednio dla jednostek średnich, małych i dużych. W przypadku zmiany podatkowego traktowania rezerw na zobowiązania obserwuje się delikatne obniżenie efektywnej przeciętnej stopy podatkowej. Efekty czasowe w opodatkowaniu przyczyniają się do zmniejszenia EATR od ok. 1 pkt proc. (małe przedsiębiorstwa z dodatnimi przepływami) do 4 pkt proc. (małe firmy z ujemnymi oraz średnie jednostki z dodatnimi przepływami). Zmiany obciążeń podatkowych są statystycznie istotne.

Słowa kluczowe: podatek dochodowy, EATR, efektywna stopa podatku, rezerwy, rachunkowość podatkowa

Kody klasyfikacji JEL: H25, H32, K34, M41
