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A BRIEF LITERATURE REVIEW ON THE PROXIES USED TO MEASURE THE CORPORATE INCOME TAX AVOIDANCE

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Abstract
In developed countries, corporate income tax (CIT) represents an important source of revenues to public budgets: in 2020, CIT brought to the budgets about 2.4% reported to the GDP. CIT was and still is one of the most appropriate taxes in terms of the possibilities to reduce the amounts paid, to report figures that say nothing to the less initiated in sophisticated financial reporting techniques. Otherwise, we would not see a series of international, regional and national regulations trying to limit the proportion of the tax avoidance (TA) or of the tax evasion (TE). The definition of TA/TE is not achieved uniformly in regulations or literature. Following Hanlon & Heitzman (2010), I aim to identify in the literature definitions of TA, its forms, as well as indicators by which it can be measured.
In the study, I will address the definition and characterization of corporate income tax avoidance, then I will focus on the variables used in literature to measure or estimate corporate income tax avoidance, on the financial or non-financial, microeconomic or macroeconomic indicators that influence TA, but also on those on which TA has effects.
Keywords: *corporate income tax; tax avoidance/tax evasion; book-tax differences; effective tax rate.*
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1. ON THE DEFINITIONS OF THE TAX EVASION / TAX AVOIDANCE

TA and TE represent one of the taxpayers' reactions to the existence of taxes, especially if the pressure that these taxes create is perceived as very burdensome. Coles *et al.* (2022) shows that the taxation of firms distorts their behaviour by making them adjust their economic decisions, including the level of production and sales, the use of inputs or investment or personnel policy.

Hanlon and Heitzman (2010) warn us that there is no universally accepted definition of TA, and it is quite possible that the meanings of tax evasion, tax avoidance, tax aggressiveness, tax planning, tax minimization, tax management should be different for different authors. As a conceptual starting point, Hanlon & Heitzman (2010) propose a very broad definition of tax avoidance: explicit reduction of paid taxes. Simser (2008) state that “tax evasion is unacceptable; tax

avoidance is perfectly acceptable". The accounting research on TA have many decades: Dyreng Hanlon and Maydew (2019) show that they began in 1980.

Tax compliance and its opposite – tax evasion – are under the influence of many factors, presented in the economic, financial, accounting, tax literature, etc. Generally speaking, regarding all taxes in a society, Ritsatos (2014) presents a literature review in which he identifies: economic freedom, the importance of financial markets, type of legal regulation, enforcement of law, crime rate, perception of legitimacy of authorities' actions, quality of education, complexity of rules, trust in authorities, example of opinion leaders, the level of development of the country, the level of sanctions for non-compliance with the law and the way of applying these sanctions, the membership of various social groups, the possible incentives granted by the authorities to those who comply with the tax, cultural characteristics, the level of the informal economy and tolerance to it, demographic factors, the influence of tax consultants.

Most proxies of TA are based on the financial statements, because tax returns are usually not available (Hanlon and Heinzman, 2010). The 12 measures identified by Hanlon and Heinzman (2010) as being used to quantify TA are:

1) GAAP effective tax rate – GAAP ETR - (or accounting ETR - AETR)> total income tax expense divided by the pre-tax income;
2) current ETR: current income tax expense divided by the pre-tax income;
3) cash ETR: the income tax paid divided by the pre-tax income or by a cash flow;
4) long run ETR: tax paid or expensed, cumulated over a longer period of time (n year, by n = 3, 5 or even ten years), divided by the pre-tax income on the same period;
5) differential ETR: the difference between the statutory tax rate (STR) and ETR;
6) DTAX: the error from the following regression: ETR differential x pre-tax book income = a + b x controls + E;
7) total book-tax difference (BTD): pre-tax income – [(national income tax expense + foreign tax expense)/statutory national tax rate] – (net operating losses in the current year – net operating losses in the previous year);
8) temporary BTD: deferred tax expense in relation to the national statutory tax rate;
9) total abnormal BTD: the residual from the regression BTD/total accruals = ß x total accruals + ßm + E (where m may represent one or more variables);
10) unrecognized tax benefits: a US GAAP-specific information, representing "tax liability accrued for taxes not yet paid on uncertain positions";
11) tax shelter activity: information identified in the companies' reports
12) marginal tax rate: the present value of the tax for an additional unit of profit.

The indicators by which TA is measured are approximate and must be interpreted with caution. Drake, Hamilton and Lusch, (2020), for example, shows that TA observed through specific proxies does not necessarily come from an intentional tax planning, but also from changes in tax law or from the carrying forward of the tax loss.

2. EFFECTIVE TAX RATES (ETR)

Effective tax rates (ETRs) have long been used to measure tax planning levels or in public discussions on issues related to tax regulatory developments. As a basic model, an ETR is calculated by dividing income tax by pre-tax income.

There are at least three possibilities in terms of the numerator: the total income tax expense (current and deferred), the current tax expense or only the tax actually paid. For companies with multinational presence, the total tax expense can be taken at the numerator, but it can be replaced by an indicator taking into account the country of origin of the respective tax. At the denominator we can take the pre-tax income, but there are also authors who adjust this result with various amounts, such as, for example, the result from extraordinary activities, or temporary differences; Also, when we talk about ETR cash, at the denominator can be put the operating cash flow or the total cash flow.

An ETR lower than the STR shows that the net book income reported includes elements that have not been and will not be found in the taxable income (Armstrong, Blouin and Larcker, 2012), for various reasons.

A common situation in the calculation and interpretation of ETR is the existence of negative net income. Gupta and Newberry (1997) identify the solutions proposed by literature to overcome this situation:

a. the ETR shall be considered to be zero, if the tax expense is negative and the pre-tax income is also negative;
b. ETR is considered to be 100%, when the tax expense is positive or zero and the result is negative or zero.

There are many other ways to winsorize outliers in ETR, including radical one – elimination of these observations.

As I mentioned above, an ETR itself does not say much – it must be compared to the statutory tax rate. This comparison is all the more useful in long-term analyses, as the statutory rates change – as a rule, decreasing – and the longitudinal interpretation of the ETR may become meaningless.

Tang, Lan Mo and Chan (2017) propose two modified effective tax rate (METR): ETR/ATR (applicable tax rate): the lower METR, the higher the TA. Lin *et al.* (2017) subtract the applicable rate (ATR or STR) from the effective rate to measure tax avoidance, just like Lee (2021).

Argilés-Bosch *et al.* (2020) use, in addition to GAAP ETR, an indicator established as a difference between the average ETR by country and group of

companies by size (the country- and size-matched ETR) from which they subtract the ETR calling this proxy ABETR (abnormal ETR).

Badertscher *et al.* (2019) considers that GAAP ETR has become a measure of tax evasion generated by the non-compliance between accounting and taxation and proposes another measure of the avoidance, calculated as the ratio between the tax paid and lagged total assets.

An ETR adjustment is used by Shams, Bose and Gunasekarage (2022), based on models found in Guenther, Wilson and Wu (2019) and Balakrishnan Blouin, and Guay (2019): The adjustment is made according to the average ETR, by industry and size. Li, Shevlin and Zhang (2022) adjust both GAAP ETR and cash ETR, by subtracting from these indicators the average ETR per industry of which the firm belongs, on the same quintile, according to the total assets.

The use of ETR to measure tax evasion is very common, but not without criticism. Schwab, Stomberg and Xia (2022) show that the ETR is a tax minimization indicator rather than a tax planning indicator, the latter being more complex and difficult to identify. Also, loss firms cannot provide an ETR, although they may also engage in tax avoidance through other techniques. The ETR also does not allow any distinction to be made between legal and illegal actions taken to reduce taxes (Jimenez-Angueira, 2018).

The easiest way to calculate an ETR is to use annual data. Considering that the strategies for reducing taxes can have long-term effects, in the ETR literature, we find aggregation of annual data for longer periods: 3 years, 5 years or even more. Dyreng, Hanlon and Maydew (2008) believe that a long-term cash ETR (ten years) better measures TA, given that the annual ETR is relatively persistent over time, but this persistence is asymmetric.

ETR can also be analysed in evolution: Platikanova (2017) takes from the literature a variable used as a proxy for overall tax aggressiveness, namely the cash ETR volatility, presented as the change in the standard deviation of cash-effective tax rates over the past five years.

Henry and Sansing (2018), on the assumption that loss companies are economically significant, propose a proxy for that will no longer eliminate these observations. The measure proposed by Henry and Sansing (2018) is based on the tax paid (CTP), from which they subtracted the tax assets corresponding to the existence of tax loss carried forward. The difference between this adjusted tax paid, on the one hand, and the tax rate x pre-tax income, on the other hand, in relation to the market value of the firm, is a measure of tax avoidance.

Drake, Hamilton and Lusch (2020), collecting manually data from the notes over a period of 20 years, find that the decrease in GAAP ETR over time, for US companies, is largely explained by the evolution of the valuation allowances of assets, and by the losses carried forward; this means that the decrease in ETR is not necessarily the result of tax-minimizing strategies, but rather the result of economic changes suffered by the company.

Sometimes the ETR is multiplied by -1, so that the meaning of the change is the same for the variables analysed (Khan, Srinivasan and Tan, 2017; Hasan *et al.,* 2017; Hasan, Habib and Alam, 2021).

3. BOOK-TAX DIFFERENCES

Book-tax gap (BTG) or book-tax differences (BTD) are usually set as the difference between book income profit and taxable income. The latter is not usually accessible in company reports, but is reconstituted by dividing the current income tax expense by the STR.

Graham, Raedy and Shackelford (2012) present two types of differences: temporary and permanent. Hanlon, Krishnan and Mills (2012) retain total, temporary and permanent BTD. Armstrong, Blouin and Larcker (2012) consider that BTG reflects both the tax planning in accordance with the rules and the one that leaves the current tax rules.

Starting from BTD, Desai and Dharmapala (2006) propose a new proxy for TA: the BTD component that cannot be attributed to accounting accruals. The fiscal aggressiveness is measured by Ying, Wright and Huang (2017) as a residual of a regression in which the dependent variable is the BTD, and the independent variables are current period investment income, interest income, operating expenses, operating profit before interest and tax, profit before tax.

Tang and Firth (2012) separate BTD into normal BTD and abnormal BTD. ABTD are the unexplained part (the residual) arising in a regression that makes the current year's BTD variable dependent on investment in assets, income variation, accounting loss, deferred tax loss, the difference between the parent's tax share and the average share of subsidiaries and BTD in the previous year.

Bringing together ETR and BTD, Atwood *et al.* (2012) propose the following TA indicator (PTEBX = profit before tax, τ = STR, CTP = current tax expense):

$$TA = \frac{PTEBX \times \tau - CTP}{PTEBX} \qquad (1)$$

Like the ETR, the BTD does not allow any distinction to be made between legal and illegal actions taken to reduce payment taxes (Jimenez-Angueira, 2018).

Other proxies for tax avoidance

Chan, Luo and Mo (2016) measure this the tax non-compliance through tax audit adjustments, book-tax compliance and book-tax differences.

Richardson, Taylor and Lanis (2016) propose as a proxy for fiscal aggressiveness, the involvement of companies in litigation with tax authorities, following a tax audit.

Tax shelter, without being illegal, result in very important tax savings for the companies that apply them and thus reductions in state tax revenues, even if it is an expensive strategy (Khan, Srinivasan and Tan, 2017). Chi, Huang and Sanchez (2017) calls corporate tax sheltering the most aggressive form of tax minimization strategies, and Gallemore, Maydew and Thornock (2014) place this form of tax

optimization at the extreme spectrum of TA strategies. Wilson (2009) argues that an increase in BTD may indicate an even greater increase in the likelihood of the firm's involvement in tax sheltering. As a proxy for tax sheltering, Gallemore, Maydew and Thornock (2014) use the existence in the press of articles about the involvement of the company in such montages.

Armstrong *et al.* (2015) use unrecognized tax benefits (UTB) as a proxy to measure tax evasion and designate it as: „management's estimate of the amount of tax savings generated by tax planning that is potentially payable to the tax authorities upon audit". To measure fiscal aggression, Law and Mills (2015) uses four proxies, including UTB balances. UTB is, however, a US-specific variable, where accounting rules require such an estimate to be presented in the financial statements.

The part TA called conforming TA is measured by Hjelstrom *et al. (*2020) as the residual of a regression in which the dependent variable is the ratio of the tax paid to ln(total assets) and the independent variables are BTD, the existence of loss, sales divided by net operating assets and the existence of operating loss.

Tax avoidance/tax evasion has an important component of profit shifting. DeSimone, Mills and Stomberg (2019) consider that this mode of transfer of profits is not defined in a complete manner in literature, but that it can be presented as a change in the place where the profit is reported. The transfer of profits to other jurisdictions cannot be measured with great certainty, so the literature proposes various proxies to identify the use of this aggressive tax planning mechanism. Klassen and Laplante (2012) point out that, in order to measure the incentives a firm has to transfer profits to other territories, the literature proposes a proxy established on the basis of the difference between the statutory tax rate in the country of residence of the parent company and the tax rates in the foreign territories where the subsidiaries are located. For this latter size, a weighted average is used; it is also possible to use cumulative data over several years The formula in Klassen and Laplnte (2012) is as follows:

$$AvgFTR = \frac{\sum_{m=0}^{4} TE_{f,t-m}}{\sum_{m=0}^{4} PTI_{f,t-m}} - \frac{1}{5} \times \sum_{m=0}^{4} STR_{US,t-m} \qquad (2)$$

where: FTR = annual incentive to shift income, $TE_{f,t}$ is the tax expense reported for the foreign jurisdictions for period t, $PTI_{f,t}$ is the pretax income reported for the foreign jurisdictions for period t, $STR_{US,t}$ is the statutory corporate tax rate for the United States for period t.

Delis, Hasan and Karavitis (2019) find significant profit-shifting activities on the part of multinationals, in the case of subsidiaries established in countries with low tax-rate uncertainty; on the contrary, the debt shifting is statistically shown to be significant also in the case of subsidiaries in high-tax-uncertainty countries. DeSimone, Mills and Stomberg (2019) use a variable to measure net flows between US companies and their overseas subsidiaries to measure income

shifting, but warn us that this technique of transferring profits is not just tax-motivated.

In an attempt to separate TA generated by the different tax rates in the states where the subsidiaries of a group are located from the TA generated by the decrease in the tax base in each country, Lampenius Shevlin and Stenzel (2021) propose an average STR which takes into account national statutory rates and reconstituted taxable income reported in each country; this ASTR may measure the avoidance generated by the different tax rates applied by the subsidiaries. For the tax base TA component, Lampenius Shevlin and Stenzel (2021), propose a reconstruction of BTD as a difference between accounting and taxable profit, the latter being the tax expense divided by ASTR.

Kim *et al.* (2022) use as a proxy for investments in tax planning the fees paid to external fiscal consultants. Guenther, Wilson and Wu (2019) propose an indicator called rate of tax avoidance, by which they designate the part of the pre-tax income that is not paid as a profit tax. Among the four proxies used to identify fiscal aggressiveness, Law and Mills (2015) propose the presence in tax havens, as well as the obligation to make adjustments as a result of tax audit (in addition to UTB and ETR)

References

1) Argilés-Bosch, J. M., Somoza, S., Ravenda, D. and García-Blandón, J. (2020). An empirical examination of the influence of e-commerce ontax avoidance in Europe. *Journal of International Accounting, Auditing and Taxation*, 41, 100339.
2) Armstrong, C. S., Blouin, J. L. and Larcker, D. F. (2012). The incentives for tax planning. *Journal of Accounting and Economics*, 53(1-2), pp. 391-411
3) Armstrong, C. S., Blouin, J. L., Jagolinzer, A. D. and Larcker, D. F. (2015). Corporate governance, incentives, and tax avoidance. *Journal of Accounting and Economics*, 60(1), pp. 1–17
4) Atwood, T. J. Drake, M. S., Myers, J. N. and Myers, L. A. (2012). Home Country Tax System Characteristics and Corporate Tax Avoidance: International Evidence. *The Accounting Review*, 87(6), pp. 1831-1860.
5) Badertscher, B. A., Katz, S. P. Olhoft Rego, S., and Wilson, R. J. (2019). Conforming Tax Avoidance and Capital Market Pressure. *The Accounting Review*, 94(6), pp. 1–30.
6) Balakrishnan, K., Blouin, J. and Guay, W. (2019). Tax Aggressiveness and Corporate Transparency. *The Accounting Review*, 94 (1), pp.45–69.
7) Chan, K. H., Luo, R. and Mo, P. L. L. (2016). Auditors' Constraining Effect on Tax Noncompliance at Different Book-Tax Conformity Levels in a Transition Economy. *Journal of International Accounting Research*, 15(3), pp. 1-30.
8) Chi, S., Huang, S. X. and Sanchez, J. M. (2017). CEO Inside Debt Incentives and Corporate Tax Sheltering. *Journal of Accounting Research*, 55(4), pp. 837-876.
9) Coles, J. L., Patel, E., Seegert, N. and Smith, M. (2022). How Do Firms Respond to Corporate Taxes? *Journal of Accounting Research*, 60(3), pp. 965-1006.
10) Delis, M. D., Hasan, I. and Karavitis, I, K. (2019). Profit shifting and tax-rate uncertainty. *Journal of Business Finance and Accounting*, 47(5-6), pp. 645–676.

11) Desai, M. A. and Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics*, 79(1), pp. 145–179.
12) DeSimone, L., Mills, L. F. and Stomberg, B. (2019). Using IRS data to identify income shifting to foreign affiliates. *Review of Accounting Studies*, 24(2), pp. 694–730.
13) Drake, K. D., Hamilton, R. and Lusch, S. J. (2020). Are declining effective tax rates indicative of tax avoidance? Insight from effective tax rate reconciliations. *Journal of Accounting and Economics*, 70(1), 101317.
14) Dyreng, S. D., Hanlon, M. and Maydew, E. L. (2008). Long-Run Corporate Tax Avoidance. *The Accounting Review,* 83(1), pp. 61-82.
15) Dyreng, S. D., Hanlon, M. and Maydew, E. L. (2019). When Does Tax Avoidance Result in Tax Uncertainty? *The Accounting Review*, 94(2), pp. 179-203.
16) Gallemore, J., Maydew, E. L. and Thornock, J. R. (2014). The Reputational Costs of Tax Avoidance. *Contemporary Accounting Research*, 31(4), pp. 1103-1133.
17) Graham, J. R., Raedy, J. S. and Shackelford, D. A. (2012). Research in accounting for income taxes. *Journal of Accounting and Economics*, 53(1-2), pp. 412–434.
18) Guenther, D. A., Wilson, R. J. and Wu, K. (2019). Tax Uncertainty and Incremental Tax Avoidance. *The Accounting Review*, 94(2), pp. 229-247.
19) Gupta, S. and Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy,* 16(1), pp. 1-34.
20) Hanlon, M. and Heitzman, S. (2010). A Review of Tax Research. *Journal of Accounting and Economics*, 50(2–3), pp. 127-178.
21) Hanlon, M., Krishnan, G. V. and Mills, L. F. (2012). Audit Fees and Book-Tax Differences. *Journal of the American Taxation Association*, 34(1), pp. 55–86.
22) Hasan, I., Hoi, C. K., Wu, Q. and Zhang, H. (2017). Does Social Capital Matter in Corporate Decisions? Evidence from Corporate Tax Avoidance. *Journal of Accounting Research*, 55(3), pp. 629-668.
23) Hasan, M. M., Habib, A. and Alam, N. (2021). Asset Redeployability and Corporate Tax Avoidance. *Abacus*, 57(2), pp. 183-219.
24) Henry, E. and Sansing, R. (2018). Corporate tax avoidance: data truncation and loss firms. *Review of Accounting Studies*, 23(3), pp. 1042–1070.
25) Hjelström, T., Kallunki, J. P., Nilsson, H. and Tylaite, M. (2020). Executives' Personal Tax Behavior and Corporate Tax Avoidance Consistency. *European Accounting Review*, 29(3), pp. 493-520.
26) Jimenez-Angueira, C. E. (2018). The effect of the interplay between corporate governance and external monitoring regimes on firms' tax avoidance. *Advances in Accounting*, 41, pp. 7–24.
27) Khan, M., Srinivasan, S. and Tan, L. (2017). Institutional Ownership and Corporate Tax Avoidance: New Evidence. *The Accounting Review*, 92(2), pp. 101–122.
28) Kim, J., McGuire, S., Savoy, S. and Wilson, R. (2022). Expected economic growth and investment in corporate tax planning. *Review of Accounting Studies*, 22(2), pp.745–778.
29) Klassen, K. J. and Laplante, S. K. (2012). Are U.S. Multinational Corporations Becoming More Aggressive Income Shifters? *Journal of Accounting Research*, 50(5), pp. 1245-1285.

30) Lampenius, N., Shevlin, T. and Stenzel, A. (2021). Measuring corporate tax rate and tax base avoidance of U.S. Domestic and U.S. multinational firms. *Journal of Accounting and Economics*, 72(1), 101406.
31) Law, K. K. F. and Mills, L. F. (2015). Taxes and Financial Constraints: Evidence from Linguistic Cues. *Journal of Accounting Research*, 53(4), pp. 777-819.
32) Lee, Y. J. (2021). The effects of analysts' tax expense forecast accuracy on corporate tax avoidance: An international analysis. *Journal of Contemporary Accounting and Economics*, 17(2,) 100243
33) Li, N., Shevlin, T. and Zhang, W. (2022), Managerial Career Concerns and Corporate Tax Avoidance: Evidence from the Inevitable Disclosure Doctrine, *Contemporary Accounting Research*, 39(1), pp. 7–49.
34) Platikanova, P. (2017). Debt Maturity and Tax Avoidance. *European Accounting Review*, 26(1), pp. 97-124.
35) Richardson, G., Taylor, G. and Lanis, R. (2016). Women on the board of directors and corporate tax aggressiveness in Australia: An empirical analysis. *Accounting Research Journal*, 29(3), pp. 313-331.
36) Ritsatos, T. (2014). Tax evasion and compliance; from the neo classical paradigm to behavioural economics, a review. *Journal of Accounting & Organizational Change*, 10(2), pp. 244-262.
37) Schwab, C. M., Stomberg, B. and Xia, J. (2022). What Determines Effective Tax Rates? The Relative Influence of Tax and Other Factors. *Contemporary Accounting Research*, 39(1), pp. 459–497.
38) Shams, S., Bose, S. and Gunasekarage, A. (2022). Does corporate tax avoidance promote managerial empire building?. *Journal of Contemporary Accounting and Economics,* 18, 100293.
39) Simser, S. (2008). Tax evasion and avoidance typologies. *Journal of Money Laundering Control*, 11(2), pp. 123-134.
40) Tang, T. Y. H. and Firth, F. (2012). Earnings persistence and stock market reactions to the different information in book-tax differences: evidence from China. *The International Journal of Accounting*, 47(3), pp. 369–397.
41) Tang, T., Lan Mo, P. L. and Chan, K. H. (2017). Tax Collector or Tax Avoider? An Investigation of Intergovernmental Agency Conflicts. *The Accounting Review*, 92(2), pp. 247–270.
42) Wilson, R. J. (2009). An Examination of Corporate Tax Shelter Participants. *The Accounting Review*, 84(3), pp. 969-999.
43) Ying, T., Wright, B. and Huang, W. (2017). Ownership structure and tax aggressiveness of Chinese listed companies. *International Journal of Accounting & Information Management*, 25(3), pp. 313-332.