Freie Universität Berlin

Fachbereich Wirtschaftswissenschaft
Univ.-Prof. Dr. Viktor Steiner
Lehrstuhl für Empirische Wirtschaftsforschung
Postanschrift: Boltzmannstr. 20 • D-14195 Berlin

Tel.: 030 838 54371
Fax: 030 838 54873
Email: viktor.steiner@fu-berlin.de
Web: http://www.fu-berlin.de/wifo/

Evaluation Report

of the

Dissertation Thesis

„Corporate Taxation, Tax Evasion, and Tax Design"

submitted by

Boryana Madzharova

The dissertation thesis submitted by Boryana Madzharova contributes to the empirical analysis of the impact of corporate income taxation, tax evasion, and tax design. The thesis consists of four chapters, two on the corporate income tax and two on the value added tax. The topic of each chapter is well motivated and based on sound economic analysis.The empirical analysis is mostly competently undertaken and the results of the analysis are of potential relevance for fiscal policy. This version of the thesis without doubt fulfills the scientific requirements for a PhD thesis and warrants a dissertation defense. The following specific comments could perhaps help to improve the analysis and in particular make the interpretation of estimation results more accessible to the reader:

In **Chapter 1** the author extends the literature on tax evasion by analyzing income shifting between the corporate income tax (CIT) base and the payroll tax. Building on the theoretical literature on tax evasion, the author develops a simple model that accounts for tax shifting between the CIT and payroll tax base and attempts to test the model implications using firm panel data for Bulgaria. Although the theoretical arguments and the empirical analysis are mostly convincing, some questions remain:

1) The basic idea is that firms and workers cooperate in hiding part of the wage ("envelope wages") to save on tax payments by income shifting between the CIT base and the payroll tax, with any tax savings divided between the two parties on the expense of a smaller overall tax base. From a theoretical perspective, one wonders whether this could work if budgetary balance was imposed, in which case either other taxes (e.g., the personal income tax or the sales tax) would have to be increased or government expenditures reduced. More specifically, it is not clear whether the standard tax evasion model is appropriate to analyze evasion of the payroll tax. This would depend on the strength of the tax-benefit linkage. If pension and unemployment benefits were closely linked to earnings, workers would require a relatively large share of tax savings to compensate for the lower benefits received in old-age or when unemployed. There is some institutional background on the pension system in section 1.3.1, but there is little discussion about the degree of the tax-benefit linkage of the payroll tax in Bulgaria here.

2) In any case, the link between the theoretical model and the empirical specification of the estimation equations is fairly weak, given that the main comparative results are with respect to unobservables (the underreporting rates for wages and taxable profits), and only the direct effect of tax rates on taxable income can be estimated, *cf*. eq. (1.2.14). Of course, there is also no reason to believe that the specific functional forms of the estimation equations (1.2.1) and (1.2.2) are implied by the theoretical model. Still, deriving theoretical implications from the model seems useful, but the shortcuts made when it comes to the em-

pirical analysis should be spelled out more clearly. Also, the parameter restriction in the alternative specification (called the "tax wedge" specification) should be related to the motivating theoretical discussion; otherwise I do not understand what the results from this alternative specification are intended to show (of course, if the parameter restriction is not rejected, estimating the restricted model would improve on efficiency; but in least some of the specifications, this restriction would probably be rejected by standard statistical tests).

3) There are quite a few alternative specifications for which full estimation results are reported. It is good practice to show the sensitivity of estimation results with respect to alternative specifications, but in the end the author should decide on the preferred specification and defend the choice with respect to both economic and statistical criteria. Although an implicit choice is made towards the end of the chapter (when the implications of the estimation results are illustrated), this leaves the reader uncertain for a rather long time and the particular choice does perhaps not seem obvious to the general reader (although I would agree with the two chosen specifications). I do not understand, however, why the short-run elasticities are considered to be preferable to the longer run (2-period) elasticities. Since both of them differ substantially, it should be explained why the short-run elasticities seem preferable, and for which purpose. *E.g.*, for the hypothetical calculations in section 1.6, I would rather consider the longer-run elasticities more appropriate, although they are really large indeed. It's also not good practice to base these calculations on statistically insignificant elasticity estimates (*cf*. column 2 in Tab. 1.11).

4) I do not understand the hypothetical calculations in section 1.6 and believe they are based on wrong derivations of elasticities. For example, based on specif. (5) in Table the elasticity of TI w.r.t. the CIT rate, evaluated at $t_s = 0.2$, would be about -3, if I am not misled. Since the CIT rate declined by about 2/3 in the observation period, the decline of the CIT base, with a reported average amount of about 2 billion € in this period, should have been substantially higher than the reported 147.5 million €. Similarly, given an estimated elasticity of the wage w.r.t. the payroll tax of about -.6, evaluated at $t_s = 0.5$) from spec. (4) in Table 1.6, the hypothetical reduction in the wage bill should have been considerably larger (by the factor 10) than indicated in the text. I am perhaps misled by the meaning of the estimated coefficients in the table, but the implied elasticity estimates should be checked by the author. I also do not understand what the meaning of the variable $\ln(t_s - t_s)$ in some of the tables might be.

5) Even if the author prefers to interpret estimation results (and perhaps has good reason for it in the case of Bulgaria) in terms of income-shifting between tax bases, other possible interpretations of estimated elasticities should at least be mentioned. For example, a relatively large TI elasticity w.r.t. the CIT rate is also found in other studies using similar specifications, but interpreted in quite different terms. Given that the elasticity estimated in the present study seems to be much higher, is only the difference in elasticities or the overall elasticity indicative for income shifting? Similarly, basic tax incidence theory would suggest that at least part of the payroll tax levied on employers is shifted onto wages.

Chapter 2 also analyzes income shifting to explain the stability of CIT revenues despite the substantial reduction in the CIT rate, where the focus is on the intertemporal dimension here. The empirical analysis is based on firm-level panel data from several new member states of the European Union. The main results of the paper are that lower CIT rates lead to contemporaneous increases in CIT revenues, but at least for one of the analyzed countries this is mostly a transitory effect due to income shifting between years with different CIT rates. The chapter makes an important contribution to the TI literature by providing new evidence on the importance of intertemporal income shifting of the CIT base for which there has been little or no empirical studies so far, in particular for the new member states of the European Union. Although I agree with most of the analysis and the conclusions, I would ask the author to consider the following:

1) The EATR is used in the empirical analysis, which is measure of the marginal and statutory CIT rate sometimes used in the literature to explain incentives of firms to undertake "profitable" investments. Since the aim here is not to explain firms' investment but taxable

income, the choice of the EATR should be motivated. In this context, it should also be explained what the mentioned measurement problem regarding taxable income (it seems to be simply calculated from the CIT assessed and the statutory CIT rate implies for this choice).

2) The discussion on the log-transformation of the dependent variable is a bit overdrawn here (as in the previous chapter), because one could calculate first-differences of the TI and the tax variables and normalize these by the mean of the two respective values; a missing would only be generated if these were both zeros. Also, the issue of zeros is not quite clear to me. There should be a substantial number of them due to loss carry-forward which is not observed in the data. There seems to be no information in the text on the actual number of zeros due to this factor. By the way, what would be the EATR for these firms?

3) As I understand Table 2.5, some of the specifications allow for different time trends across countries but restrict the estimated net-of-tax coefficients to be equal for all countries (although tax elasiticities could differ because of different tax levels). Is there a reason for this restrictions, given the large data set would even have allowed to estimate separate regressions for each country? This is actually done in a later section, where estimation results in Table 2.9 reveal extreme heterogeneity in estimated tax coefficients across countries. Furthermore, they indicate that the average result is very much driven by the estimates for Romania, not only because of the large size of the coefficients but also of the very large share (75% !) of observations for this country in the estimation sample. So, I wonder what should be learned from the average regression estimates, and why the main tables in the text refer to them. The author discusses potential data related and institutional reasons for these heterogeneous country results, which for me simply indicate that the sample should not be pooled for the estimation of the effects of CIT rates on TI.

4) It would also be helpful if the author clearly stated which one of the large number of alternative specifications she considered as most reliable, and for which reason because estimation results differ substantially between the alternatives. One can only speculate from the discussion on p. 61 that (7) in Table 2.10 is the author's preferred specification, which yields an estimate of the long-run tax effect of virtually zero, but a range between zero and 0.2 is also mentioned in the conclusion. However, if I take estimation results in Table 2.9 as my preferable results (because they account for heterogeneity in estimated tax effects across countries), I wonder how differences in the transitory, expected, and longer-term effects across countries can be related to differences in economic and institutional factors. There is unfortunately very little discussion of the estimation results here.

Chapters 3 and **4** are concerned with empirical and policy analyses of the implications of payment methods and tax evasion with respect to the value added tax, and how recent VAT reform proposal may affect this relationship. This is an important topic for tax policy in view of the increasing importance of internet transactions, with consumption and payments for transactions taking place in different countries of the European Union. I found both the empirical analysis in Chapter 3 and the policy evaluation in Chapter 4 interesting and well executed. The empirical results in Chapter 3 are probably better interpreted as statistical correlations than causal effects. Still, estimation results provide valuable information for tax policy. The only suggestion for improvement I have here is, again, to make a somewhat stronger case for the preferred specification and focus discussion of estimation results on it, so that the reader won't get lost in view of the large variety of estimation results. Finally, the policy analysis in Chapter 4 convincingly shows the potential use of empirical evidence of the time produced in the previous chapter for ex-ante policy evaluation.

Professor Viktor Steiner Berlin, January 7, 2013