The elasticity of taxable income in the presence of deduction possibilities

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\textbf{A B S T R A C T}

Several recent studies show that the elasticity of taxable income (ETI) is not a sufficient statistic for the welfare costs of taxation due to factors such as tax-base shifting. This paper provides an additional argument demonstrating the non-sufficiency of the ETI, namely tax deductions. Building on a theoretical framework which incorporates deductions in a standard optimal-tax model, we show that the ETI is not sufficient for welfare analysis if (i) deductions generate externalities and if (ii) deductions are responsive to tax-rate changes. While the first condition should arguably hold true for the majority of tax deductions, we provide an empirical examination of the second condition. Relying on rich German panel data from administrative tax records, we exploit several tax reforms that were implemented in Germany between 2001 and 2008. Our main estimates indicate an overall ETI between 0.54 and 0.68 and an elasticity of deductions with respect to the net-of-tax rate of about $-0.9$. These results suggest that the ETI is not sufficient to calculate the welfare cost of taxation.

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We start our empirical analysis with estimating tax elasticities for gross and taxable income and continue with the analysis for different types of deductions. Identifying the impact of tax changes on deductions is generally subject to the same econometric challenges as estimating the ETI. First, there exists a mechanical relationship between tax deductions and tax rates in progressive tax systems, and second, mean reversion as well as heterogeneous income trends have to be accounted for. This motivates us to employ an empirical strategy for estimating the ETI and deduction elasticities that follows the recent contribution by Weber (2014).6

Our findings suggest a statistically significant elasticity of taxable income with respect to the net-of-tax rate in the range of 0.54 to 0.68. In compliance with most other studies, we find a lower elasticity of gross income (EGI), with estimates between 0.16 and 0.28. The results further show that the difference between ETI and EGI is driven by deductions that are indeed responsive to changes in the net-of-tax rate: the elasticity of the sum of deductions is estimated to be around —0.9. We additionally show that the behavioral response is mainly due to (itemized) deductions which are relatively less likely to be third-party reported and which can be more easily adjusted by taxpayers. We also explore the tax responsiveness of different categories of deductions. The results show that deductions, which arguably generate some type of externality, are sensitive to changes in the tax rate, suggesting that the elasticity of the sum of deductions is mostly driven by responses of externality-generating deductions.

Our paper makes three contributions to the literature. First, we add to the discussion on the potential role of the ETI as a sufficient statistic for welfare analysis. Besides the contributions by Chetty (2009) and Gorodnichenko et al. (2009), a series of earlier papers has identified revenue offsets, i.e., shifting income to other tax bases, as a threat to the interpretation of the ETI as a sufficient statistic (Slemrod, 1998; Gordon and Slemrod, 2002; Slemrod and Yitzhaki, 2002; Saeez, 2004). We present an additional argument as to why the ETI is hardly able to be interpreted as a sufficient statistic for the efficiency costs of income taxation, namely that tax deductions generate externalities beyond tax base effects and are responsive to tax-rate changes. As a theoretical contribution, we show that the non-sufficiency result of Chetty (2009) also holds in an optimal-tax model with heterogeneous agents, redistribution and public good provision following Saeez (2004).7

Second, we provide further insights on the “anatomy of tax systems”.8 As pointed out by Slemrod (1996), Saeez (2003) or Saeez et al. (2012), detailed knowledge about the different adjustment channels underlying the ETI is desirable as the government has full control over the definition of taxable income. Knowing the responsiveness of its components can hence help to design (more) efficient tax systems.9 So far, direct evidence on the effect of taxes on tax deduction behavior is relatively scarce. Exceptions are Matikka (2014), who presents suggestive evidence from Finland that certain deductions are responsive to income taxes, and Bastani and Selin (2014), whose analysis indicates that taxable income

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5 Bach et al., (2013) analyze the ratio of taxable income to reported broad income over time. Their findings are broadly in line with our numbers although they employ a different concept of broad income and use a different data source.

6 The Weber (2014) approach is an advancement of the widely used empirical strategy proposed by Gruber and Saeez (2002). Other recent studies such as Chetty et al. (2011) or Kleven and Schultz (2014) also exploit local kinks in tax schedules to identify the ETI. Such an approach is, however, not applicable to the German case since there are no tax brackets in the German tax schedule.

7 Our theoretical findings are related to An (2015) who extends the representative-agent model of Chetty (2009) to allow for charitable giving and warm-glow, but does not account for redistribution.

8 Our study is also related to the literature showing that charitable donations (which are usually deductible) are responsive to tax changes (see, e.g., Jouiffri, 2000; Andreoni, 2006 and Yörük, 2013 for surveys).

9 Among all possible adjustment channels that are summarized in the ETI, the responsiveness of labor supply has received the most attention in the literature finding modest behavioral elasticities (see Blundell and MaCurdy, 1999 and Bargain et al., 2014 for surveys). Other channels that have been found to contribute to the ETI are, e.g., inter- and intra-temporal income shifting (Auerbach and Slemrod, 1997; Kreiner et al., 2013; Harju and Matikka, 2013; le Maire and Schijnewijz, 2013; Kreiner et al., 2014), or tax non-compliance (Gorodnichenko et al., 2009; Kleven et al., 2011).

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2 For instance, in the US, itemized deductions represent about 12% of taxable income, worth a total of $80 billion (Saeez, 2004). The ratio of deductions to taxable income is 0.25 in Germany (see below). Deductions generally play an important role in most countries’ personal income tax codes (Ernst & Young, 2013) suggesting that our results are not only relevant for Germany or the US.

3 In Chetty (2009), efficiency costs are lower than indicated by the ETI because sheltering behavior generates additional tax revenues (either directly in other tax bases or through fines and penalties in expectation) or transfers to other agents. As a result, the elasticity of (expected) total tax revenues or a weighted combination of the ETI and the elasticity of gross income (EGI) measures the efficiency costs of taxation.

4 We acknowledge that some deductions may incur welfare losses. For example, if deduction possibilities trigger overconsumption, sheltering behavior will be associated with resource costs that reduce the economic pie. Welfare costs may also arise because of the opportunity costs of filing deductions.

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