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The elasticity of taxable income in the presence of deduction possibilities[☆]

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ABSTRACT

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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1. Introduction

The large literature on the elasticity of taxable income (ETI) estimates the responsiveness of taxpayers to income-tax changes (see Saez et al., 2012 for an overview). Recent studies find elasticities with respect to the net-of-tax rate in the range of about 0.1 to 0.8 (e.g., Weber, 2014; Kleven and Schultz, 2014), suggesting that income-tax payers are sensitive to taxes and alter their taxable income

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in response to tax rate changes. Following the seminal contributions by Feldstein (1995, 1999), the literature often used, and sometimes still does, such ETI estimates as a “sufficient statistic” to measure the dead-weight loss of income taxes.¹ This assumes that all types of behavioral responses that affect taxable income, such as labor supply adjustments, charitable donations, or illegal evasion, have the same impact on welfare, and thus can be boiled down to one single number, the ETI. Chetty (2009), however, shows that the channel along which taxable income responses occur may make a difference for the efficiency losses induced by income taxes. If sheltering behavior to reduce taxable income generates externalities, such as transfers to other agents in the economy, losses to overall welfare are lower compared to cases in which behavioral adjustments are associated with real resource costs.

In this paper, we explore the welfare effects of tax reforms in the presence of tax deductions as a further argument of why the ETI is not

¹ For example, Saez et al. (2012, page 4) state that the ETI “holds the promise of more accurately summarizing the marginal efficiency cost of taxation than a narrower measure of taxpayer response such as the labor supply elasticity, and therefore is a worthy topic of investigation.”

a sufficient statistic. We hence focus on a specific adjustment channel that is common and important in almost all personal income tax systems across the world.² We set up a theoretical model building on Saez (2004) which incorporates deductions in a standard optimal-tax framework. The model shows that the ETI is not a sufficient statistic for the efficiency costs of income taxation if (i) deductible expenses generate externalities and if (ii) claimed deductions are responsive to tax rate changes. The rationale for the non-sufficiency of the ETI is related to but conceptually different from the sheltering argument in Chetty (2009).³ The difference to Chetty's point comes from the fact that externalities induced by deductions can be different from externalities that arise because of revenue offset (including evasion fines) or direct transfers to other agents, for instance by contributing to a public good.

An economic rationale for the allowance of deduction possibilities in the tax law is to encourage certain behavior or expenses that produce welfare benefits – in the future or present. In other words, the motivation behind deductions is usually to incentivize behavior that generates interpersonal or intertemporal externalities. For example, deductions in the form of charitable donations are transferred to another agent in the economy, implying that the amount deducted is not lost, but serves society. Deductible investments in education or professional training will increase human capital, leading to higher incomes and hence higher future tax revenues. Given the purpose and character of most deductions, we argue that the first condition for the ETI *not* to be a sufficient statistic is likely to be fulfilled: deductible expenses typically generate non-negligible externalities and therefore have different efficiency costs than other adjustment margins.⁴

The second condition for a non-sufficient ETI is fulfilled if the elasticity of deductions with respect to changes in the net-of-tax rate is different from zero. From a theoretical perspective, tax deductions should respond to tax rate changes through an income and a substitution effect. A higher tax reduces the relative price of deductions and should therefore have a positive effect on claimed deductions via the substitution effect, while the income effect goes in the opposite direction. That is, the overall effect is ambiguous and it is an empirical question what the sign of the deduction elasticity with respect to the net-of-tax rate is.

In order to answer this question, we use comprehensive German panel data from administrative tax records that provide detailed information on all income-tax relevant parameters including all available tax deductions. We exploit variation in tax rates induced by various income tax reforms implemented in Germany in the early 2000s. These reforms affected different types of taxpayers differently. The top marginal tax rate decreased from 53% to 42% over this period. At the same time, the lowest marginal tax rate fell from 24% to 15%, while tax rates in the middle of the distribution partly increased. These differential reform intensities allow identification of the tax-rate effect on deduction behavior. Given our research question, studying the case of Germany is of particular interest as the German tax system allows for a very large set of deductions: on average, taxable income is more than 20% lower than reported gross income. In total, there are more than 500 different deduction possibilities, with variation in the use of deductions over the income distribution and by income source (Kirchhof, 2011).⁵

² For instance, in the US, itemized deductions represent about 12% of taxable income, worth a total of \$80 billion (Saez 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.

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.

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 offset, 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; Saez, 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 Saez (2004).⁷

Second, we provide further insights on the "anatomy of tax systems"⁸ as pointed out by Slemrod (1996), Saez (2003) or Saez 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

⁶ The Weber (2014) approach is an advancement of the widely used empirical strategy proposed by Gruber and Saez (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., Joulfaian, 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 Schjerning, 2013; Kreiner et al., 2014), or tax non-compliance (Gorodnichenko et al., 2009; Kleven et al., 2011).

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