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# Rational choice of itemized deductions

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## **Abstract**

This paper analyzes the effect of standard deductions on itemized deductions. Using German income tax data, it shows that the distribution of itemized deductions above the level of the standard deduction is positively skewed, with the mode lying somewhat above the standard deduction. This pattern of claimed tax allowable expenses could be easily explained by the rational minimization of tax payments in excess of the costs of reporting these deductions. An alternative explanation, namely tax aversion, is unable to replicate this pattern, as tax aversion would predict bunching of taxpayers directly above the lump-sum deduction.

*JEL Classification:* H24, H26

*Keywords:* Tax compliance, tax allowable expenses, itemized deductions, simplification

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# 1 Introduction

For many years, income tax simplification has been an issue in economic research and in the public debate worldwide (see, PWC and World Bank, 2011). Tax complexity is associated with the number and difficulty of the distinctions contained in the tax law, high compliance costs, and uncertain true tax liability (see, Alm, Jackson, and McKee, 1992; Kaplow, 1995; Slemrod, 1996; Shaw, Slemrod, and Whiting, 2010). By definition, tax simplification would reduce compliance costs and, therefore, the marginal costs of public funds. Taxpayers would require less professional tax advice and save time when preparing their tax returns. As several studies have claimed that compliance costs are high and rising (see, among others, Moody, Warcholik, and Hodge, 2005; Vaillancourt and Clemens, 2008; Eichfelder, 2011), the potential welfare gains from tax simplification seem to be quite high. Furthermore, it has often been argued that tax complexity is a major driver of tax evasion. On the one hand, taxpayers' uncertainty regarding true taxable income increases the risks of evasion and thus reduces incentives for rational taxpayers to evade (see, Alm, Jackson, and McKee, 1992). On the other hand, a simplified tax system may build a sense of well-being and, thus, provide a positive incentive to comply with tax law (see, Smith and Stalans, 1991; Forest and Sheffrin, 2002). Tax complexity may also lead to perceptions that the tax system is unfair, as it creates loopholes that can be more easily exploited by sophisticated and wealthy taxpayers (see, Fuest, Peichl, and Schaefer, 2008). However, as the need to make the tax base more accurately reflect taxpayers' relative taxpaying ability surely increases the complexity of the tax system (see, Kaplow, 1996), a complex system need not be considered unfair. This result is confirmed by certain empirical studies (see, Forest and Sheffrin, 2002). Tax simplification may also involve an equity-efficiency trade-off, as it may reduce both the distortions and the level of redistribution (see, Fuest, Peichl, and Schaefer, 2008). As the existence of complexity enhancing subsidies for certain activities and groups can often be attributed to special interest politics (see, Kaplow, 1996), the political debate on tax simplification is often blurred by intensive lobbying activities.

There are essentially two different tax simplification strategies. First, a highly non-linear tax schedule could be transformed into a flat tax. This would reduce the costs to calculate the tax burden and the marginal tax rate and would make tax planning less

useful. In the second, and more sophisticated, strategy, the calculation of the tax base could be simplified, e.g., by eliminating deductions or introducing larger standard deductions. Third, changes to the tax schedule and the tax base could be combined. The often proposed tax-cut-cum-base-broadening policies belong to the latter category. As Fuest, Peichl, and Schaefer (2008) rightly state, tax-base broadening may not necessarily reduce compliance costs (the inclusion of imputed rents for owner occupied housing is a frequently mentioned counter example). Both introducing lump-sum deductions covering a variety of work-related expenses and eliminating itemized deductions for work-related expenses reduces administrative and compliance costs but also leads to production inefficiency. Abolishing personal tax allowances related to individual needs will raise equity concerns.

Few empirical studies on the effects of simplifying the deductions in the German income tax exist. Regarding earnings, Fuest, Peichl, and Schaefer (2008) consider the reduced tax deductibility of commuting costs and the abolition of tax-free bonuses for night, weekend, and holiday labor and the saver's allowance. With respect to taxable income, they analyze tax allowances for the elderly, single parents, and children and deductions for tax accountancy costs, church tax (which is optional) and donations. They find that tax base simplification leads to a reduction in the use of professional tax advice, a more equitable income distribution, and an increase in tax revenue.<sup>1</sup>

As Slemrod (1989) argued, taxpayers make a choice between itemized deductions and the standard deduction. The purpose of this paper is simply to analyze this choice with respect to German income tax rules. To demonstrate how standard deductions affect tax returns, we take income-related expenses and gross income as given. The focus is purely on declaration. We will show that a lump-sum deduction reduces the claims of taxpayers who could deduct expenses slightly above the lump-sum deduction. Thus, the range of taxpayers that is positively affected by an increase in any lump-sum deduction is larger than it appears at first glance. Using German income tax data, this paper demonstrates that the distribution of itemized deductions above the level of the standard deduction is positively skewed, with relatively few taxpayers itemizing deductions slightly above the standard deduction. This pattern of claimed tax allowable expenses could easily be explained by the

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<sup>1</sup>Eichfelder, Evers, Gläser, Heinemann, Jenzen, Kalb, and Misch (2010) claim that the intensive use of lump-sum deductions and the elimination of itemized deductions has substantial cost-saving potential.

rational minimization of tax payments in excess of the costs of reporting these deductions. Finally, we analyze whether a model of tax aversion could reproduce the observed pattern of tax allowable expenses reported in the tax files. Our model of tax aversion is unable to replicate this pattern, as it would predict bunching of taxpayers directly above the lump-sum deduction.

The paper is organized as follows. Section 2 analyzes the pattern of tax allowable expenses under the German income tax code, with a focus on work-related expenses. It demonstrates that this pattern is quite stable across time and type of expenses. Next, section 3 provides a rationale for this pattern and section 4 demonstrates that strong tax aversion would lead to a different pattern. Section 5 concludes.

## **2 Standard deductions offered by the German income tax code**

In Germany, taxable income is calculated on the basis of earnings, defined as gross income minus income-related expenses. Earnings are separately calculated from seven different types of sources and then aggregated to total earnings. By deducting certain expenses not directly related to business or employment, taxable income is derived from total earnings. The income tax payable on the wages and salaries of employees is deducted at the source, but the employee is obliged to file a tax return once a year if he or she has income from certain other sources and under other well defined circumstances. In general, to classify expenses as income related expenses the taxpayer has to verify that these expenses were made to earn an income. However, to simplify tax collection and reduce the burden of compliance for both employees and employers the tax code defines a standard deduction for work-related expenses which was €1023 from 1980 until 2002, when it was raised to €1044, declined to €920 in 2004, and was increased again to €1000 in 2011. If gross income falls short of the standard deduction, the deduction is reduced accordingly. The taxpayer only has to itemize deductions if work-related expenses exceed the standard deduction. According to income statistics, a large fraction of taxpayers do not claim work-related expenses above the standard deduction. In 2008, the most recent year for which reliable

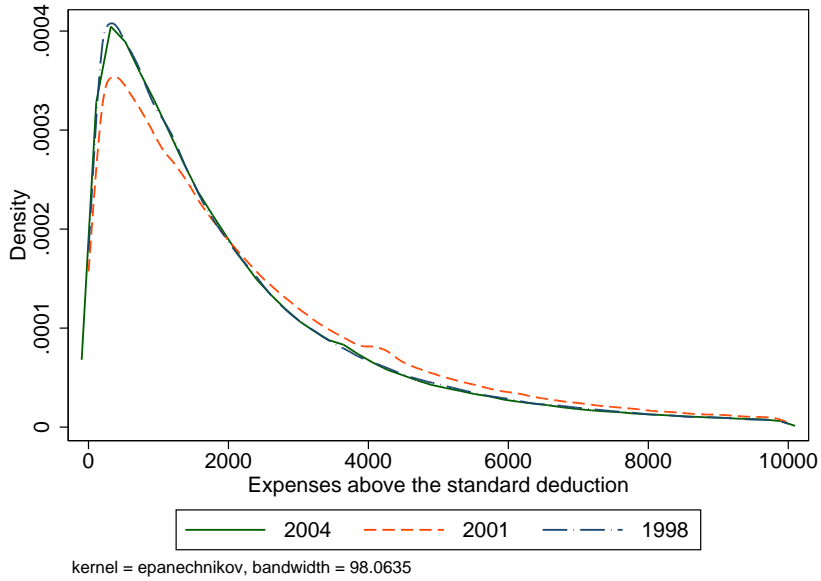


Figure 1: Kernel estimation of work-related expenses of men above the standard deduction

data are available, the standard deduction applied for 48.7% of employees subject to wage taxation (see Federal Statistical Office, 2012). However, for a non-negligible fraction of employees, work-related expenses exceed the standard deduction (in 2008: 51.3%). This is primarily because expenses related to traveling to work are generously deducted (in 2008: 59.3% of all work-related expenses exceeding the standard deduction). In addition, the dual residence relief and additional expenditures for food account for a large fraction of work-related expenses. Furthermore, some employees can deduct the costs of renting a home office and various means of work. Finally, expenditures on training, job applications, and keeping an account are deductible.

To analyze the pattern of income-related expenses, we use the de facto anonymized micro-data files on income tax statistics for 1998, 2001, and 2004 provided by the Research Data Centers of the Federal Statistical Office and the statistical offices of the Länder in Germany. Each of these micro-data sets is a nationally representative stratified 10% sample of taxpayers, where the data are taken from the income tax files.<sup>2</sup>

<sup>2</sup>Due to the anonymization strategy, some information, particularly on high income earners, is blurred or deleted (for more details on anonymization, see Merz, Vorgrimler, and Zwick, 2005). As these data are

The distribution of work-related expenses has the following properties: First, as there is no monetary incentive to claim deductions below both the standard deduction and gross earnings, reports on expenses in this range are clearly incomplete. Second, as has already been shown for 2008, the standard deduction applies for a large fraction of taxpayers, (52.4-59.2% of men and 63.3-75.5% of women). Third, above the standard deduction, the distribution of work-related expenses is positively skewed in every year for both men and women. Only a small fraction of taxpayers successfully claim expenses in the range of up to approximately €200 above the standard deduction (for men, see Figure 1). The mode of the distribution of work-related expenses is approximately €300 above the standard deduction. Furthermore, the shape of the probability density function of work-related expenses above the standard deduction is qualitatively the same for various subgroups of tax payers. For example, further dividing the sample into taxpayers above and below the median tax rate does not change the pattern substantially. However, in a statistical sense, the annual distributions differ across periods; the Kolmogorov-Smirnov test rejects the hypothesis of equal distributions. This is unsurprising, as wages, prices, tax laws, and many other determinants of labor supply, expenses, and income have changed over time. For example, in 2000-2001, the dot-com bubble collapsed but GDP growth remained positive; in 2002, a minor recession affected the labor market. However, the overall pattern of work-related expenses *above the standard deduction* is the same across periods. If claimed work-related expenses solely depended on wages, prices, and tax rates, the pattern should have changed, as it is completely implausible that the standard deduction has been adjusted to stabilize the distribution of work-related expenses above the standard deduction. The strikingly stable pattern suggests that the size of the standard deduction itself has a substantial impact on itemized deductions.

Not only work-related expenses but also the distribution of capital-income related expenses above the basic allowance is positively skewed in Germany. Until 2008, capital-income was only effectively taxed if it exceeded a basic allowance. The basic allowance was €3068 in 1998, €1534 in 2001, and €1370 in 2004. Furthermore, expenses of €51 were routinely deducted. Calculating capital-income related expenses above the sum of administrative data, little information on socio-economic backgrounds and no information on attitudes and intentions are available.

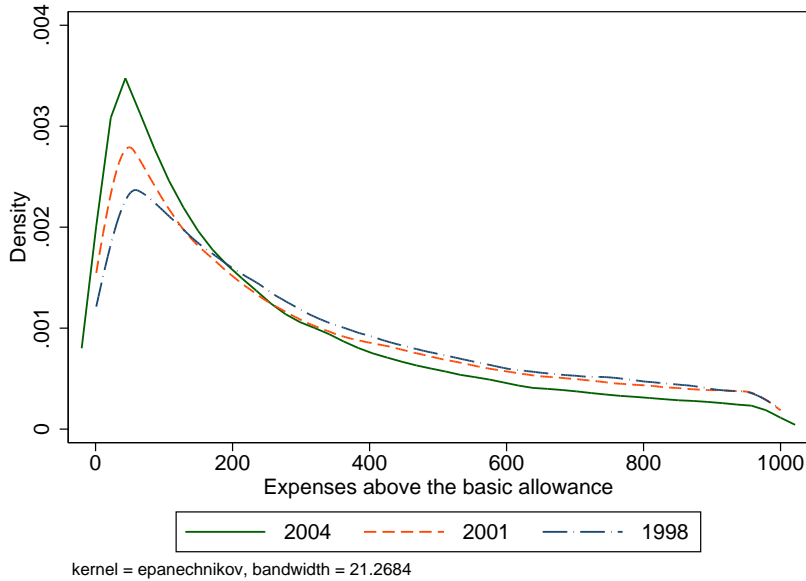


Figure 2: Kernel estimation of capital-income-related expenses above the basic allowance

the basic allowance and the small lump-sum deduction for taxpayers (either individuals or jointly taxed married couples) with earned income, it reveals that the probability density function is also positively skewed and relatively stable over time. There are no substantial qualitative differences between the shapes of the distributions of work-related expenses and capital-income related expenses above the respective allowances (see Figure 2).

### 3 Deductions in the absence of tax aversion

To analyze the effect of a lump-sum allowance on tax filing, we develop a simple decision model of optimal filing. To this end, we take gross income and true income-related expenses as given and focus on tax filing rather than on labor supply and human capital investment.<sup>3</sup> For a given gross income  $y$  and income-related expenses  $a$ , the taxpayer decides whether to claim additional deductions  $d$ , where  $d \geq 0$ . Any claim of additional expenses is costly,

<sup>3</sup>The model is a simplified version of Slemrod (1989) but accounts for compliance costs. Wrede (1993), pp. 35-40, developed a simple model of risky tax avoidance that includes risk aversion. The inclusion of risk aversion would only affect the results in this section quantitatively.



e.g., because receipts must be collected and additional paper work is required. Costs  $c(d)$  are monotonically increasing and strictly convex; in the absence of additional claims, costs are zero:  $c(0) = 0, c'(d) \geq 0$ , and  $c''(d) > 0$ . Additional deductions reduce tax liability if all claimed deductions,  $a + d$ , exceed the standard deduction,  $s$ . If gross income falls short of the standard deduction, i.e., if  $y < s$ , deductions reduce tax liability whenever  $a + d > y$ . The tax rate  $t$  is taken as fixed. As the analysis focusses on a relatively small range of taxable income, disregarding income tax progression is a reasonable simplification. The tax authority may or may not audit the tax file and may or may not accept the claim. Additional deductions are rejected with probability  $p$ .<sup>4</sup> Because we assume that the tax payer provides all the necessary evidence and does not hide relevant information, the taxpayer's activity is classified as an attempt to avoid taxes rather than tax evasion. As a consequence, the taxpayer does not face any punishment. For  $\min\{s, y\} \geq a + d$ , tax avoidance only generates costs no benefits. If  $a > \min\{s, y\}$ , the expected profit is  $G = (1 - p)td - c(d)$ ; if  $a + d > \min\{s, y\} > a$ , the expected profit is  $G = (1 - p)t(a + d - \min\{s, y\}) - c(d)$ . In the latter case, gains are reduced because the (income adjusted) standard deduction is granted anyway. Thus, the expected profit of the tax avoider can be written as

$$G = \begin{cases} -c(d) & \text{if } \min\{s, y\} \geq a + d, \\ (1 - p)t(\max\{a + d, \min[s, y]\} - \max\{a, \min[s, y]\}) - c(d) & \text{otherwise.} \end{cases} \quad (1)$$

Case specific optima are determined as follows

$$\begin{aligned} d = 0 & \quad \text{if } \min\{s, y\} \geq a + d, \\ (1 - p)t - c'(d) = 0 & \quad \text{if } a + d > \min\{s, y\}. \end{aligned} \quad (2)$$

Thus, the taxpayer makes claims according to

$$d = \begin{cases} d^* = c'^{-1}[(1 - p)t] & \text{if } G(d^*) > 0, \\ 0 & \text{otherwise} \end{cases} \quad (3)$$

(see also Figure 4). The taxpayer claims deductions above the (income adjusted) standard deduction if the expected profit of the case specific optimum level  $d^*$  is strictly positive.

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<sup>4</sup>To simplify, we assume  $(1 - p)t > c'(0)$ .

Using the envelope theorem, it becomes clear that this is more likely the higher the tax rate,  $t$ , the lower the audit rate,  $p$ , and the higher any cost increasing parameter is. An increase in the exogenously determined level of expenses,  $a$ , increases the probability of additional claims for medium values of  $a$ . For very low or very high  $a$ , a small change in  $a$  has no effect on additional claims, as the costs of exceeding the allowance are excessively high or because the taxpayer claims additional deductions regardless. Provided that gross income is sufficiently high, a change in the standard deduction has the opposite effect on claims. In other words, there is a critical level of the difference between predetermined expenses and the threshold, that is  $a - \min\{s, y\}$ . Above this level,  $d^*$  is claimed because  $G(d^*) > 0$ . Below this level,  $d = 0$ . Because  $(1 - p)td^* > c(d^*)$ , at the critical level, predetermined expenses are below  $\min\{s, y\}$ . For  $s < y$ , taxpayers do not claim additional expenses if the predetermined expenses are sufficiently below the standard deduction.

In this simple model, it is assumed that costs of claiming additional deductions do not depend on the level of predetermined expenses,  $a$ . Due to some complementarity, this might not be true in reality. If the costs of additional claims depend negatively on  $a$ , the positive effect of  $a$  on additional claims would be reinforced. Furthermore, the audit probability was assumed to be fixed. However, if the fiscal authority is aware of the underlying process, it may determine the audit probability so as to maximize tax payments net of audit costs. This should have a negative effect on additional claims. However, a detailed analysis of the optimum audit strategy is above the scope of this paper (see, e.g., Mookherjee and P'ng, 1989; Besfamille and Parlato Siritto, 2009).

To calculate whether this simple model is in line with the observed pattern of income-related expenses, we specify the cost function as  $c(d) = \gamma d^2$  and assume that different taxpayers face different tax rates. Furthermore, we assume that predetermined expenses,  $a$ , are distributed according to a Pareto distribution, and that tax rates,  $t$ , are distributed according to a truncated normal distribution. More specifically, we use the following probability density functions and approximations

$$\begin{aligned}
 f_a(a) &= \frac{\mu_a a_l^{\mu_a}}{a^{\mu_a+1}}, \quad \text{where } \mu_a = 1, \text{ for } a \geq a_l, \\
 f_t(t) &= \frac{fnd[(t - \mu)/\sigma]/\sigma t}{Fnd[(t_{max} - \mu)/\sigma] - Fnd[(t_{min} - \mu)/\sigma]}
 \end{aligned} \tag{4}$$

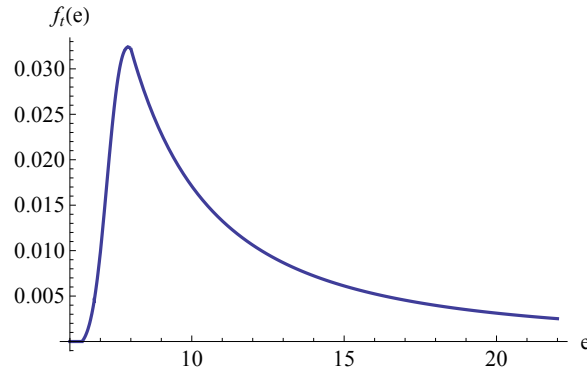


Figure 3: Simulated probability density distribution of income-related expenses above the standard deduction

where

$$\begin{aligned}
 fnd(t) &= \frac{\exp(-t^2/2)}{\sqrt{2\pi}}, \\
 Fnd(t) &= 1 - fnd(t) [b_1\theta(t) + b_2\theta(t)^2 + b_3\theta(t)^3 + b_4\theta(t)^4 + b_5\theta(t)^5], \\
 \theta(t) &= 1/(1 + b_0t), \\
 \mu &= 0.4 * (t_{max} + t_{min}), \sigma = 0.1, \\
 b_0 &= 0.2316419, b_1 = 0.319381530, b_2 = -0.356563782, \\
 b_3 &= 1.781477937, b_4 = -1.821255978, b_5 = 1.330274429.
 \end{aligned}$$

To simplify, we assume that gross income is sufficiently high so as not to affect the declaration of expenses. The observed expenses are denoted  $e$ . Using the parameters  $a_l = 2, s = 6, \gamma = 0.05, p = 0.2, t_{min} = 0.1$ , and  $t_{max} = 0.5$ , a distribution of observed income-related expenses above the lump-sum allowance,  $e$ , emerges, which displays a similar pattern to that observed in German income statistics (see Figure 3).

We believe that the Pareto distribution is a natural candidate for the distribution of income-related expenses and that the truncated normal distribution is also very plausible. While the former distribution is critical for the emerging pattern, the latter can be easily modified without producing completely different conclusions. For example, if the tax rates were distributed uniformly on the same interval, we would still obtain a positively-skewed distribution of observed income-related expenses. Therefore, our conclusion is that the

observed pattern of income-related expenses and, in particular, the impact the standard deduction has on this pattern can be easily explained by rational decisions on claimed income-related expenses.

Finally, if  $p$  were set equal to zero, the model developed in this section could be re-interpreted without the notion of tax avoidance, leading to a similar pattern of expenses. If  $a$  denotes expenses that are automatically disclosed to the fiscal authority, e.g., by the employer or any other third party,  $d$  indicates expenses where disclosure is costly, e.g., because written evidence has to be collected and provided. Deductions are the solution to a simple trade-off between tax savings and compliance costs. This re-interpretation makes it clear that the positively-skewed distribution of income-related expenses does not necessarily hint at illegitimate misdeclaration.

## 4 Deductions in the presence of tax aversion

An alternative approach to determine claimed deductions refers to evidence that taxpayers seek to save on taxes ‘almost’ irrespective of costs. Kirchler (1998) showed that attitudes toward taxes are negative, especially the first spontaneous associations. According to Kirchler, Maciejovsky, and Schneider (2003) tax avoidance is perceived positively. Across several experiments, Sussman and Olivola (2011) provide evidence that people have a stronger preference to avoid tax related costs than to avoid equal-sized (or larger) monetary costs unrelated to taxes. To model this type of tax aversion, we assume, for the sake of simplicity, that claiming costs are linear,  $c(d) = \gamma d$ , but the benefits of expected tax deductions,  $b$ , are strictly concave,  $b' > 0 > b''$ . Furthermore, marginal benefits go to infinity when expected tax savings,  $(1 - p)t (\max\{a + d, \min[s, y]\} - \max\{a, \min[s, y]\})$ , go to zero. As a consequence, the taxpayer will never abstain from claiming deductions. Expected profits are

$$G = b[(1 - p)t (\max\{a + d, \min[s, y]\} - \max\{a, \min[s, y]\}) - c(d)], \quad (5)$$

and the optimum is determined by

$$d^* = \max\{a, \min[s, y]\} - a + b'^{-1} \left[ \frac{\gamma}{(1 - p)t} \right]. \quad (6)$$

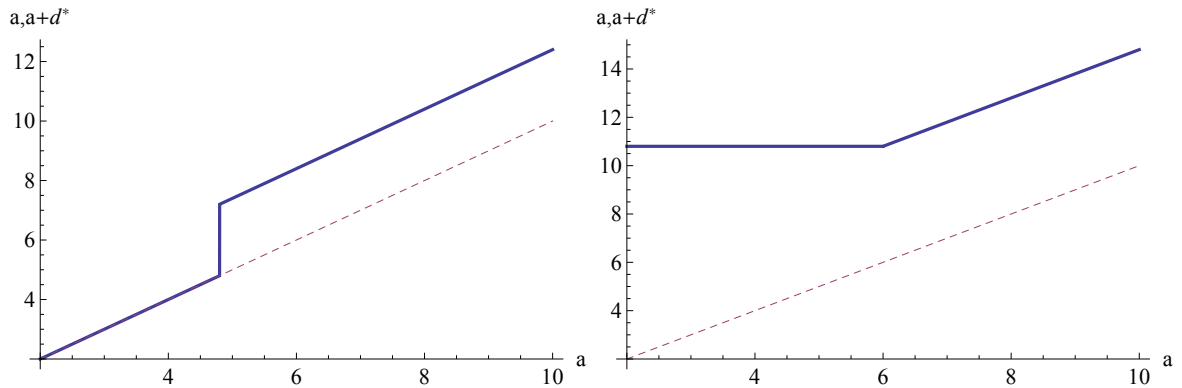


Figure 4: Deductions in the absence (left) and the presence of tax aversion (right)

Qualitatively, declarations in the presence or absence of tax aversion differ for predetermined expenses,  $a$ , below the threshold  $\min(s, y)$  (see Figure 4).

Therefore, itemized deductions shift the probability density function of expenses to the right. If predetermined expenses,  $a$ , are low, the taxpayer chooses a high level of additional deductions  $d$  to exceed the threshold  $\min(s, y)$ . Taxpayers who face a low marginal tax rate will claim fewer additional deductions than high-income taxpayers. Tax aversion implies bunching of expenses slightly above the standard deduction. Depending on the distribution of tax rates and declaration costs, the pattern of bunching may vary. However, only if very few taxpayers face a quite low marginal tax rate and/or rather high declaration costs, could a steep increase of the probability density function occur directly above the standard deduction. This seems rather implausible. Therefore, the observed pattern of income-related expenses contradicts the (strong) tax-aversion hypothesis.

## 5 Concluding remarks

This paper analyzed the effect of standard deductions on itemized deductions. Using micro-data files on German income tax statistics for 1998, 2001, and 2004, it showed that the distribution of itemized deductions above the level of the standard deduction is positively skewed, with the mode lying somewhat above the standard deduction. This pattern of claimed tax allowable expenses could easily be explained by the rational minimization of

tax payments in excess of the costs of reporting these deductions but not by a simple model of tax aversion, as the latter predicts bunching of taxpayers directly above the lump-sum deduction.

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