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**Article**

## How Bracket Creep Creates Hidden Tax Increases: Evidence from Germany

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## How Bracket Creep Creates Hidden Tax Increases: Evidence from Germany<sup>1</sup>

### BRACKET CREEP CREATES COVERT TAX RATE INCREASES

In recent years Germany has seen a significant increase in its tax revenues, mainly thanks to income tax revenues which have risen steadily as a share of total tax revenues (cf. for example, Breuer 2016; Dorn et al. 2017b, p. 56). Although the favourable situation in the labour market at present is largely responsible for this fiscal growth, ‘hidden’ tax increases due to the bracket creep also play a key role in this development. It is important to distinguish between tax revenues generated by bracket creep in the narrow and in the broader sense of the term.

#### Bracket Creep in the Narrow Sense of the Term

If incomes rise with inflation, gross real income remains constant. The progressive income tax rate based on nominal figures nevertheless leads to an increase in the individual tax burden, and thus lowers the real net incomes earned by citizens. This phenomenon is the so-called bracket creep in the narrow sense of the term. Although the German government has to report to the parliament on the state of bracket creep every two years, this does not involve any legal obligation to adjust the taxation rate accordingly. It remains at the discretion of the federal government in question to carry out tax rate revisions. After the revision in 2010 there was no significant tax rate adjustment to compensate for the bracket creep until 2015, but merely legally stipulated adjustments of the basic tax-free allowance covering the minimum subsistence level, as well as partial changes to tax deductible allowances. In the years from 2011 to 2015 additional tax revenues generated by inflation-related bracket creep totalled 28.2 billion euros (Dorn et al. 2017b). To date the German federal government has only adjusted tax rates for 2016 and 2017, as well as announcing a revision for 2018, which reduces the annual bracket creep, but does not completely offset the additional tax rate burdens of previous years (cf. Beznoska 2016, Dorn et al. 2016, Dorn et al. 2017b).

<sup>1</sup> Parts of this article are based on an article published in ifo Schnelldienst (Dorn et al. 2017a) and a study carried out by the ifo Institute for the FDP parliamentary party (Dorn et al. 2016).

### Bracket Creep in the Broader Sense of the Term

Another aspect of the bracket creep remains largely ignored by the public debate – namely the so-called bracket creep in the broader sense of the term. This second aspect of the bracket creep arises from growth in real income, in addition to or possibly even in the absence of an increase in the overall price level. This extended interpretation of bracket creep earned the state additional tax revenues of 52.1 billion euros from 2011 to 2015, i.e. 23.9 billion euros more than the purely inflation-related increase in bracket creep over the same period. Since revisions of the income tax rate during the period from 2016 to 2018 only aimed to compensate for the inflation-related increase, bracket creep in the broader sense of the term looks set to rise in the future (Dorn et al. 2017b).

An increase in the tax burden borne by individual taxpayers is desirable if the latter earn relatively high incomes compared to other taxpayers. The bracket creep in the broader sense of the term, however, occurs if the level of real incomes rises in an economy; even if individual taxpayers do not earn higher incomes compared to the economy as a whole. In this case the state absorbs an increasingly large share of private revenues due to the progressive tax rate, i.e. a tax revenue elasticity which is greater than one. In the case of real economic growth, a growing number of revenue earners “slip” into higher tax rate brackets, which, in turn, weakens the redistribution effect of the income tax. Germany’s tax wedge, which is already one of the largest of all OECD countries, rises as a result which pushes up the tax rate over time even without inflation (cf. Dorn et al. 2016, Dorn et al. 2017b). The state demands a higher percentage of additionally earned income in taxes than it did of the previously prevailing income level. It is precisely this increase in the contributions burden that forms the “second part” of the bracket creep. However, the relative tax burden on society, and by extension the tax rate, should not rise over time due to a mechanism inherent in the tax rate, but should rather remain constant *ceteris paribus*, especially without a specific democratic vote on it.

#### A “Rolling” Tax Rate

The additional burden on income earners generated by the bracket creep can be corrected relatively easily. Many economists propose a rolling income tax rate<sup>2</sup>, a concept that has already been implemented in several OECD countries (cf. Lemmer 2014). According to this concept, the threshold figures for the tax brackets that define the income tax rate (possibly including tax allowances) are automatically adjusted to the price

<sup>2</sup> See, for example, Sinn (2003, p. 470), German Council of Economic Experts – Annual Report 2011/12, p. 206ff, Lemmer (2014) as well as Dorn et al. (2016). Bach (2016, p. 168ff.), by contrast, is sceptical about the need for a rolling rate and highlights that citizens obtain tax relief in real terms via volume-based taxes and that bracket creep also functions as an automatic stabiliser.

level and/or developments in income. If both components of the bracket creep, namely the effect of inflation and of real income growth, were to be taken into account, the threshold figures and components of the tariff formula would have to be regularly multiplied with a nominal gross income growth factor.<sup>3</sup>

This article begins by presenting the reform options of a “rolling” income tax rate as a tax rate indexation that automatically eliminates the bracket creep. It also quantifies how the bracket creep burden was distributed across the various income groups between 2010 and 2018, and who has borne the greatest tax burdens due to bracket creep.

### ELIMINATING BRACKET CREEP BY INDEXING THE TAX RATE

Since the present income tax rate based on nominal figures does not take bracket creep into account, there seems to be a need for reform. One solution to the bracket creep problem advocated by many economists is an indexation of the tax rate. In this context it seems sensible to monitor two variables: inflation or nominal income, depending on whether the bracket creep in the narrower or broader sense of the term is under consideration.

#### Automatic Adjustment to Price Developments – Eliminating Bracket Creep in the Narrow Sense of the Term

If the income tax rate is indexed to the general price level, it is possible to avoid tax increases due to purely nominal changes in income that would otherwise arise in the case of constant and/or even falling real wages. This means that real purchasing power losses generated by the tax system can be circumvented. This would eliminate an inflation-related bracket creep in the narrow sense of the term. Such an automatic annual adjustment of the income tax rate to price developments is already legally binding in many countries including Belgium, Britain, Canada, the Netherlands, Switzerland and the United States of America. In most of these countries the amounts of tax deductible items, along with the tax rate parameters themselves, are automatically adjusted on an annual basis in line with inflation. In countries with no regular legally-binding tax rate indexation like Germany, France and Finland, governments often only sporadically update tax rate benchmarks and thus use bracket creep as a ‘hidden’ source of additional tax revenues (cf. Lemmer 2014 for an international comparison of tax rate indexation).

A central feature for assessing taxation equity in German tax law is the ability-to-pay principle. According to this principle, each citizen should contribute to financing the community according to his/her individual economic capacity. The tax rate should therefore

<sup>3</sup> This corresponds to a multiplying with the total of inflation and real gross income growth.

be adjusted to price developments from an economic point of view, since only income increases that exceed inflation indicate a higher real ability-to-pay on the part of taxpayers. Even if tax rate parameters (and the potential amounts of tax deductible, if applicable) are updated in line with price developments, increases in real income are still coupled with an increase in the tax burden.

Due to the (aggregate) real increases in productivity forecast, a corresponding tax revenue elasticity which is greater than one can still be expected to lead to an increase in the tax rate as measured by the national income. This implies that the state itself absorbs a growing share of private income even if the tax rate is indexed to inflation. There is nevertheless no direct economic justification for the related inherent mechanism of an automatic increase in the tax rate. In terms of the current German income tax rate with its different brackets, it is rather a question of citizens slipping into higher tax brackets, which reduces the social distribution effect of the tax burden. This, in turn, deviates from the distribution effects of the taxation system originally intended by the legislator (and hence the electorate). Lower and middle-income earners in particular face a steadily growing burden in Germany due to bracket creep and will contribute a growing share of tax revenues as a result. There is no explicit democratic legitimisation of this automatic change in tax burden distribution.

#### Automatic Adjustment Based on Nominal Income Developments – Eliminating Bracket Creep in the Broader Sense of the Term

If developments in nominal income, i.e. the sum of inflation-related and real income growth, are taken into account in measuring taxation instead of inflation, the bracket creep in the broader sense of the term will also be eliminated, and a tax rate increase will be avoided should real income rise. A progressive tax burden in this instance only takes effect in the case of different income increases between taxpaying entities, but no longer in the case of general real increases in wages and income. Although it is accompanied by the renunciation of automatic tax rate increases in the course of an economy’s real productivity gains, the tax burden rate related to aggregate income, and in turn the distribution effect of income tax, remains largely constant *ceteris paribus*. From a distributional point of view, it follows that tax rate indexation with nominal growth in income would be desirable. The income tax rate and the amount of tax deductible are annually adjusted to reflect growth in nominal wages in Norway, Denmark and Sweden; and this is a legal obligation in the latter two countries (see Lemmer 2014).



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### Reform Option: a Rolling Income Tax Rate

One of the forms of tax rate indexation frequently recommended and implemented in many countries is the concept commonly referred to as the so called “rolling rate.”<sup>4</sup> This procedure is applied directly to adjust the parameters that define the income tax rate. The threshold values of the different tax brackets and certain parameters of the rate formula are automatically adjusted over time according to the growth factor of price levels and/or of nominal gross wages. The advantage of a rolling rate compared to other adjustment options lies in the transparent method of calculating income tax (cf. Dorn et al. 2016 on the calculation method and a discussion of its practical implementation). A rolling tax rate provides sufficient transparency in the taxation process for citizens and, as a result, the political legitimization of a corresponding reform.

### DISTRIBUTION EFFECTS FOR VARIOUS INCOME GROUPS

The effect of the additional tax burden through bracket creep, as well as the relief provided by a rolling tax rate for various income groups in Germany, is simulated using the example of a couple with joint tax assessment and two children with different total gross annual incomes.

### Data and Methodology

To measure the extent of bracket creep, micro-data from the German wage and income tax statistics for 2010 (Statistical Offices 2016) are used to estimate taxation effects with the ifo Income Tax Simulation Model.<sup>5</sup> The calculations are based on static statistical equilibrium analyses, while dynamic labour supply effects are not taken into consideration. Using 2010 as a base year the gross income is updated with gross wage growth up until 2018.<sup>6</sup> The increase in employment, as well as changes in tax deductible allowances and standard deductions like the increase in the employee’s standard allowances, advertising cost allowances and allowances for children in the years between 2010 and 2018 are implemented. The reference scenario also takes into account the adjustment of the parameters made in the income tax rate during the years 2010 to 2016, as well as the German federal government’s decision of

October 2016 to adjust the tax rate in 2017 and 2018.<sup>7</sup> It also takes into account the increases made in the tax-free allowance and the tax allowance for children through 2018. The extent to which the adjustments agreed for the years 2017 and 2018 can compensate for bracket creep in previous years is also analysed. Building on this, the income tax burden of a sample household is simulated for each year using the ifo simulation model while considering tax-free allowances and deductible items.

To calculate the effect of bracket creep, the formula parameters and tax brackets of the income tax rate of 2010 are updated with the consumer price index (to determine bracket creep in the narrow sense of the term) and/or nominal gross wage growth per employee (to determine bracket creep in the broader sense of the term). The parameters are updated through 2018<sup>8</sup> and applied to the incomes which are to be taxed. This income tax burden arising from a hypothetical rolling tax rate applied in 2010 is subsequently compared with the (simulated) income tax due if actual changes in taxation law over the period in question are taken into consideration. Accordingly bracket creep is calculated as the difference between actual income tax amounts and theoretical figures generated by rolling rates.

### Burdening and Disburdening Effects for Sample Families

Our simulation shows that the bracket creep in Germany leads to an annual additional tax burden in the years from 2011 to 2018 across all of the considered income groups. The ‘hidden’ tax effect is greater if the tax rate parameters are updated with growth in real gross income in addition to inflation. Overall, the bracket creep in the narrow and broader sense of the term created an additional annual burden of 45 euros and/or 211 euros for households liable to tax and with a gross annual income of 25,000 euros in 2010. The absolute estimated annual average burden of a sample household with an annual gross income of 100,000 euros, by contrast, is already as high as 533 euros and/or 1,180 euros. It emerges that a rolling rate in 2010 would have disburdened all of the income groups observed in the subsequent years. The absolute disburdening is greater, the higher the income of the households in question (cf. Figures 1 and 2). For a jointly assessed household with an average annual gross income of 50,000 euros, the potential cumulative tax relief for the years 2011 to 2018 amounts to 1,888 euros and/or 4,811 euros, depending on whether bracket

creep is considered in the narrow or broader sense of the term.

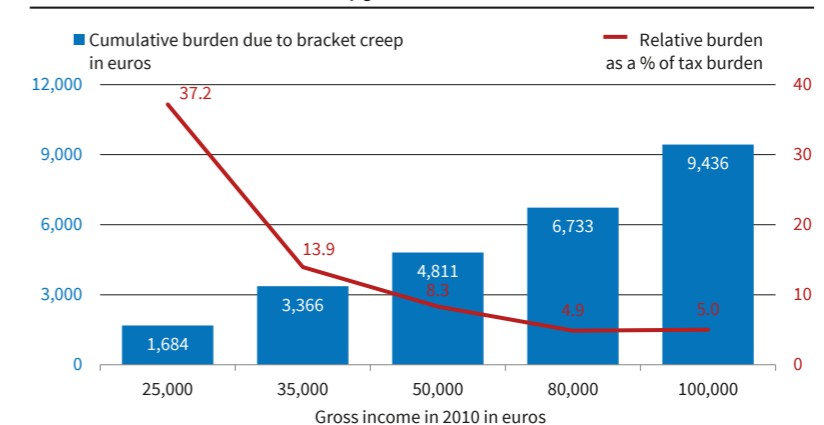
In relative terms the introduction of a rolling rate to eliminate bracket creep, by contrast, will particularly disburden households in the middle tax bracket. For a jointly assessed employee household with two children and an annual gross income of 25,000 euros (in 2010), the total additional burden caused by bracket creep (in the narrow sense) amounts to 8.0% and/or 37.2% (in the broader sense) of total income tax. For taxable individuals with a gross annual income of 35,000 euros, the financial disburdening through a rolling rate as opposed to the prevailing tax rates between 2011 and 2018 is 4.9% or 13.9%. Households with a gross annual income of 100,000 euros, by contrast, would receive cumulative relief of between 4,266 euros and 9,436 euros, and/or between 2.3% and 5.0%.<sup>9</sup> However, the disburdening effects at a household level show one thing very clearly: the shift in the income tax rate implemented in Germany in 2016 and the legal decision taken in October 2016 to adjust the tax rate to reduce bracket creep in 2017 and 2018 by no means compensate for the burdens shouldered by taxpayers in the preceding years.

If the annual trend in bracket creep in the broader sense is considered, it becomes clear that the burden for jointly assessed taxable employees with two children continued rising, despite sporadic adjustments to German taxation law. These years are characterised by strong growth in real gross wages. Inflation-related adjustments of the rate parameters in the years from 2016 to 2018 could therefore not compensate for the bracket creep in the broader sense of the term. This means that the state disproportionately skimmed off the productivity gains of the working population between 2011 and 2018.

<sup>9</sup> Our results on the disburdening and distribution effect by income groups basically fall into line with the results of other studies. Differences arise due to different assumptions regarding the individual, stylized sample case. Cf. Breidenbach et al. (2014) and the German Federal Ministry of Finance (2015).

Figure 1

### Cumulative Absolute und Relative Taxation Effect<sup>a</sup> of Bracket Creep In the broader sense, from 2011 to 2018 by gross income



<sup>a</sup> Incl. solidarity tax.

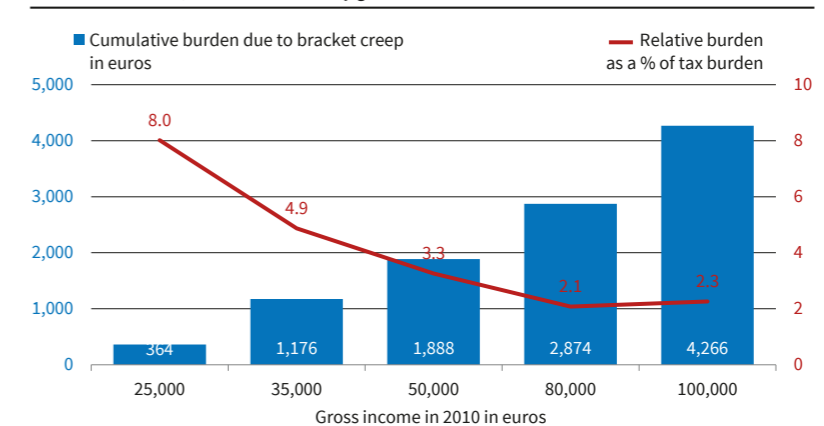
Note: The cumulative figures for 2011 to 2018 refer respectively to a household consisting of a jointly assessed couple and two children. The tax rate for 2010 forms the basis for the forward projection of the tax rate indexation.

Source: own calculations, based on Federal Statistics Offices (2016).

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Figure 2

### Cumulative Absolute und Relative Taxation Effect<sup>a</sup> of Bracket Creep In the narrow sense, from 2011 to 2018 by gross income



<sup>a</sup> Incl. solidarity tax.

Note: The cumulative figures for 2011 to 2018 refer respectively to a household consisting of a jointly assessed couple and two children. The tax rate for 2010 forms the basis for the forward projection of the tax rate indexation.

Source: own calculations, based on Federal Statistics Offices (2016).

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<sup>4</sup> In principle, there is also the option, in addition to a rolling tax rate, of implementing tax rate indexation using a fixed basic rate with income deflation. For an in-depth discussion and assessment of tax rate indexation reform options, cf. Dorn et al. (2016, p. 4-7).

<sup>5</sup> The data set used represents a 10%-sample of all individuals subject to income tax and covers around 3.9 million observations. The calculations refer to gross taxation revenues, which differ from the final cash revenues.

<sup>6</sup> For gross wage growth per employee through 2015, see the German Federal Statistics Office (2016a). Figures on employment growth, as well as growth in gross wages and wages per employee from the Joint Economic Forecast (2016) are used for the calculations from 2016 to 2018.

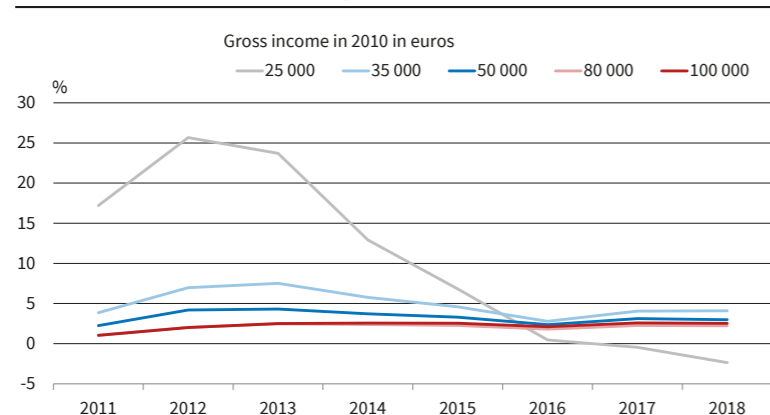
<sup>7</sup> The latter serve to compensate for bracket creep for the years 2016 and 2017. For this purpose, the tax rate benchmarks in 2017/2018 are shifted to the right by the expected inflation of the preceding year. The forecast inflation rates are taken from the German federal government’s current mid-term economic forecast.

<sup>8</sup> The consumer price index was used for inflation through 2015 (German Federal Statistics Office 2016b). The inflation forecast for 2016 is based on the Joint Economic Forecast (2016). Figures on employment growth, as well as increases in gross wages and earnings per employee from the Joint Economic Forecast (2016) are used for the time period through 2018.

Figure 3

**Bracket Creep<sup>a</sup> as a Share of the Tax Burden**

In the narrow sense, from 2011 to 2018 by gross income

<sup>a</sup> Incl. solidarity tax.

Note: The cumulative figures for 2011 to 2018 refer respectively to a household consisting of a jointly assessed couple and two children. The tax rate for 2010 forms the basis for the forward projection of the tax rate indexation.

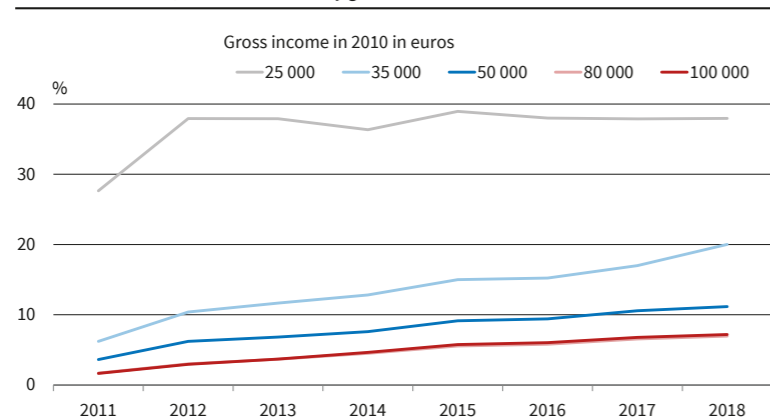
Source: own calculations, based on Federal Statistics Offices (2016).

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Figure 4

**Bracket Creep<sup>a</sup> as a Share of the Tax Burden**

In the broader sense, from 2011 to 2018 by gross income

<sup>a</sup> Incl. solidarity tax.

Note: The cumulative figures for 2011 to 2018 refer respectively to a household consisting of a jointly assessed couple and two children. The tax rate for 2010 forms the basis for the forward projection of the tax rate indexation.

Source: own calculations, based on Federal Statistics Offices (2016).

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25.7% in the inflation-related bracket creep as a share of the tax burden as of 2013, these households nevertheless remained the most heavily affected by bracket creep in comparative terms. This group did not enjoy the greatest tax relief in comparative terms until the compensatory measures taken in the years between 2016 and 2018. For households with a gross annual income of 35,000 euros, the relative burden borne between 2011 and 2018 ranged between 2.8% and 7.5%. Although these households were not given tax relief to the same extent as the lowest income groups, their relative tax burden still fell. For jointly assessed households with a gross income of between 50,000 and 100,000 euros, the relative burdens between 2011 and 2018 remained fairly constant at a level between 1% and just over 4%.

Figure 4 presents the various burden effects of different household incomes for the bracket creep in

the broader sense of the term. As for the inflation-related bracket creep, households with the lowest gross incomes also exhibited the highest comparative burden of up to 39%. For the remaining households the maximum burden in 2018 ranges from 7.2% (for households with a gross income of 100,000 euros) and 20.0% (for households with a gross income of 35,000 euros). The relative burden effect of bracket creep in the broader sense of the term falls as annual gross income rises. Unlike inflation-related bracket creep, the burden shares caused by bracket creep in the broader sense of the term remained relatively steady at a high level. In other words, the German federal government fell far short of compensating for the higher tax burden through real income growth with its tax rate adjustments.

Overall, it becomes clear that the recent tax law revisions made to address the bracket creep in the narrow sense of the term between 2016 and 2018 target, but by no means compensate for the additional burden created entirely by inflation from 2011 to 2015. Moreover, the decision not to take a bracket creep in the broader sense into account further weakened the incentive effects of the income tax, which

should be geared towards relative income differences within the population liable to pay tax. There is therefore not only a need for future reforms to take a more active approach to the problem of bracket creep, but also a need to compensate taxpayers for 'hidden' additional tax burdens due to productivity gains.

**CONCLUSION**

From an economic policy viewpoint, the phenomenon of bracket creep is a welcomed gift to politicians seeking re-election, since it generates tax increases that do not require parliament's approval and are not the outcome of a public policy debate. What is more, these tax increases are 'hidden'. The negative voter reactions that are to be expected from any public debate over tax increases can be sidestepped as a result. Rising tax revenues help to satisfy voter wishes without creating

budget deficits. Consequently, politicians favouring the expansion of state activity will take little interest in a reform that eliminates bracket creep. This does not mean, however, that a reform is not necessary.

Although the bracket creep sporadically crops up in economic policy debates in Germany, such discussions typically focus on a bracket creep in the narrow sense of the term, namely the higher additional taxation burden generated by the increase in the price level. The bracket creep in the broader sense of the term, however, includes the increase in taxes and the taxation rate resulting from growth in real income. A growing share of private revenues – even in the absence of inflation – is absorbed by the state. These additional burdens for taxpayers, however, are largely ignored in the public debate. This second effect of bracket creep is mostly unknown to the public as the media and politicians focus on bracket creep in the narrow sense of the term.

The results of our simulations show that an automatic correction of income tax rate would seem appropriate in order to prevent the inherent mechanism of hidden tax increases. This is particularly true since lower and medium income earners are hit the hardest by bracket creep. The so-called 'middle-class bulge' in the current German income tax rate makes it particularly painful for income earners in these groups to slide up into higher tax brackets due to the progressive marginal tax rate, since the marginal tax rate and, in turn, the relative tax burden, rise sharply. Taxpayers who already pay the top tax rate are affected less by a bracket creep. For them the increase in the average taxation rate, and thus the 'covert tax increase' caused by bracket creep, is comparatively moderate since the marginal tax rate does not rise any further.

In response to the bracket creep, we propose a rolling tax rate. An automatic form of compensation already exists for bracket creep in many countries. From a public finance point of view it seems necessary to account not only for the effect of rising prices, but also the effect of rising real incomes, in order not to change the distribution effect of the taxation system as originally intended by the legislator. Public spending can be kept constant as a result, and excessive 'state expansion' at the expense of the private sector can be prevented. It is important to emphasize that state revenues will continue to grow, even if a rolling rate is applied. Even if bracket creep in the broader sense of the term is taken into consideration, state revenues still rise proportionally to growth in nominal income. A rolling tax rate merely prevents state revenues from rising disproportionately to growth in real income and prices.

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