

# The Political Cost of Taxation: New Evidence from German Popularity Ratings

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# **The Political Cost of Taxation: New Evidence from German Popularity Ratings**

## **Abstract**

Previous studies indicate that higher tax burdens reduce incumbent's popularity and re-election odds, suggesting the existence of a political cost of taxation. The present paper offers a new test of this relation for German data. Our findings indicate that taxation indeed has a negative impact on government approval ratings in Germany, in line with previous international research. Nonetheless, the government's popularity losses do not lead to comparable gains in the opposition's popularity. Also, the political costs of taxation are limited to the tax burden imposed by the federal government and do not extend to taxes levied at lower levels of government (in line with rational voter behaviour).

**Word count:** 7648 words

**Key words:** Tax policy, government approval ratings, popularity function, Germany.

# **The Political Cost of Taxation: New Evidence from German Popularity Ratings**

## ***1. Introduction***

Scholarship in both political science and economics has awarded substantial attention to explaining variations over time and space in election results and popularity ratings, through estimation of so-called vote and popularity functions. Some of these build mainly on political variables (such as ‘honeymoon’ effects or ‘pre-election rebounds’; see below), while others concentrate on the effect of economic variables (such as unemployment, inflation and GDP growth) to explain variations in politicians’ popularity (for a review, see Nannestad and Paldam, 1994). This vast literature has also addressed the effects of fiscal policies on politician’s popularity or re-election chances. Indeed, fiscal policies are likely to be a sensitive issue for voters (since each would rather pay less than more taxes and receive more than less benefits in return). Therefore, taxation can be expected to influence voters’ assessment of their incumbents and to become reflected in politician’s popularity ratings and election results.

The first studies assessing the political effects of taxation already appeared in the late 1960’s and considerable, though not unambiguous, support for a negative effect of taxation on popularity and re-election odds has been established since then (e.g. Pomper, 1968; Turett, 1971; Niskanen, 1979; Johnson et al., 2005). The present paper adds to this literature in three ways:

Firstly, we re-analyse the taxation-popularity relationship using German data. This is important since most studies thus far have concentrated on the US and UK. Given the

ambiguity of previous findings, an extension to different settings and other countries may be imperative to advance our understanding of the effect of taxation on government popularity. While Cusack (1999) precedes us in studying tax-effects on German government popularity, he restricts himself to direct taxation. In the present paper, we take a broader perspective by regarding the overall tax burden (as well as its constituent parts).

Secondly, and unlike Cusack (1999), we not only gauge the effect of taxation on incumbents, but also on the opposition (cfr. Landon and Ryan, 1997; Feld and Kirchgässner, 2000). Opposition popularity has received much less attention in the literature thus far than the incumbent's popularity ratings. Still, an analysis of opposition parties may reveal additional information since a loss of popularity for the government might – but need not necessarily – translate into increased popularity of the opposition.

Thirdly, we test the proposition that rational voters should only take account of the tax burden due to the incumbent at a certain level of government. That is, in our setting, taxation at lower (or higher) levels of government should not affect German federal government (or opposition) popularity. To the best of our knowledge, this has not been addressed in previous empirical work.

The outline of the paper is as follows. In section 2, we discuss the previous literature on the electoral cost of taxation. Section 3 describes the evolution of the total tax burden and government and opposition popularity in Germany over the period 1977-2003. In section 4, these two data series are brought together to assess the electoral cost of taxation for the government and opposition in Germany. Section 5 concludes.

## 2. *The electoral cost of taxation: Review of the literature*

The relation between taxation and incumbent popularity has been investigated mainly by looking at the effect of the total tax burden imposed on the population (measured through total tax revenues). This indicator was first employed in two studies of US gubernatorial election results (Pomper, 1968; Turett, 1971). Neither study, however, finds a consistent relation between taxation and the incumbent governor's electoral result. This (non-)finding was later replicated by Hansen (1999) using US governor popularity ratings rather than election results. Other studies, however, illustrate that the total tax burden does negatively affect the popularity or election results of US governors (e.g. Peltzman, 1992; Lowry et al., 1998; Sobel, 1998; Kelleher and Wolak, 2005)<sup>1</sup>, the US president (e.g. Niskanen, 1975, 1979; Peltzman, 1992; Cuzán and Bundrick, 1999; Geys and Vermeir, 2006; see, however, Hibbs, 2000) and the British government (Pissarides, 1980).<sup>2</sup>

Given the complexity of real world tax systems, it is of interest to note that the political effects of taxation tend to vary across types of taxation. Paldam and

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<sup>1</sup> Lowry et al. (1998) and Sobel (1998) show that the electoral cost of taxation in the US is different for the two main political parties. Republicans fare worse (better) under increasing (lowering) tax burdens, while the opposite is true for Democrats. This effect, however, appears to depend on whether or not there is unified (rather than divided) government (Lowry et al., 1998).

<sup>2</sup> A number of studies focus on revenues from one particular tax source, viz. direct income taxation. While Hibbs and Madsen (1981), Happy (1992) and Cusack (1999) find a significant political cost of direct taxation in the US, Canada and Germany respectively, Peltzman (1992) fails to support this result when analysing election results in the US. Related, Case (1994) and Besley and Case (1995)

Schneider (1980), for example, find that Danish voters in the 1960s and 1970s respond differently to changes in revenues from various tax sources, and that these reactions vary over time. Landon and Ryan (1997) confirm these findings in a study of government and opposition popularity in Canadian provinces. Also in line with this idea is the finding by Kone and Winters (1993) and Stults and Winters (2005) tax rate changes are politically more costly for sales taxes than income or ‘sin’ taxes (i.e. taxes on beer, gasoline and cigarettes).<sup>3</sup>

Finally, a number of studies examine the electoral cost of introducing new taxes. Whereas Eismeier (1979) finds new taxes to negatively affect the incumbent US governor’s vote share, Kone and Winters (1993) cannot unequivocally confirm this when concentrating on new sales or income taxes in the same setting. Gibson (1994), assessing the UK’s poll tax introduction in 1990, finds this new tax to have significantly lowered the Conservative party’s vote share in local elections in Birmingham (the Conservative party was responsible for the poll tax at the national level).<sup>4</sup>

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show that increasing income tax liabilities for high-income earners in the US significantly reduce the incumbent governor’s re-election odds.

<sup>3</sup> Eismeier (1979) and Johnson et al. (2005) show that tax rate increases in general are politically harmful for the incumbent. Niemi et al. (1995) and MacDonald and Sigelman (1999) illustrate that more numerous tax increases during the legislative term significantly depress the vote or approval rating for the incumbent US governor.

<sup>4</sup> Politicians clearly believe that introducing new taxes will invoke electoral punishment and avoid such actions when elections are imminent (e.g. Mikesell, 1978; Berry, 1988; Berry and Berry, 1992,

### ***3. Evolution of German government popularity ratings and the German tax burden***

In the present paper, we relate German government and opposition popularity ratings to the total tax burden imposed on the population such as to test whether there is a political cost of taxation in Germany. However, before turning to the empirical specification and results, the current section expounds on the two main ingredients of the model: popularity ratings (section 3.1) and tax revenues (section 3.2).

#### 3.1. Popularity ratings

The ‘Politbarometer’-surveys by the Forschungsgruppe Wahlen (Mannheim) have asked German respondents how satisfied they are with the performance of their government and the opposition roughly every month since 1977. The relevant questions are as follows:

‘Are you rather satisfied or rather dissatisfied with the performance of the German government consisting of ... [names of parties in government]?’

‘And how satisfied or dissatisfied are you with the performance of ... [names of parties in opposition] in the opposition?’

Respondents can reply on an 11-point scale ranging from -5 to +5. Following Cusack (1999), we employ the share of positive assessments (i.e. +1 to +5) as our measure of

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1994; Ashworth et al., 2006). Ashworth and Heyndels (2002) furthermore show that changes in the tax structure are less likely in election years.

government (and opposition) popularity.<sup>5</sup> Also, while the surveys have taken place almost every month since their inception, we aggregate the monthly figures to the quarterly level to accommodate the frequency of some of the independent variables in the regression analysis in section 4.

Figure 1 contains the resulting popularity ratings for both the German government and the opposition for the period 1977:1 up to 2003:4. Time is set out on the X-axis, while the percentage of respondents expressing positive approval of the government (or opposition) is set out on the Y-axis. It should be noted here that although data are available for the former Eastern German states as of 1991, we only include respondents of the former West-German states. The reason is a change in the sampling procedures for the Politbarometer surveys in 1996, reducing the ‘East-German’ sample to 25% of the ‘West-German’ one (from equal sample sizes prior to 1996). This adjustment leads to an unwarranted downward shift in the overall popularity rating in that year since the former East is generally (slightly) less approving than the former West. This re-sampling bias is avoided by concentrating on the ‘West-German’ data only. Still, since the ‘dynamics of the two series track very closely’ (Cusack, 1999: 642) exclusive reliance on the ‘West-German’ sample is unlikely to affect the results of our analysis (since only the level of popularity and not its variation is affected by inclusion of the ‘East-German’ respondents).

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Figure 1

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<sup>5</sup> The question for the opposition slightly altered after 1989. Rather than ask about the entire opposition, the new question inquires separately into the large and small opposition parties. As the

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Three things are immediately apparent in Figure 1. Firstly, the popularity of both government and opposition has been steadily decreasing in Germany over the 27-year period under study. Secondly, there are significant variations around this common downward trend. These shocks appear stronger for the government than for the opposition, indicating higher volatility in government popularity. They also tend to be more outspoken in the second half of the period under study. Especially since the early 1990s government – and especially opposition – has become much more volatile. Finally, the data do not indicate opposite patterns in both series. That is, Figure 1 does little to indicate that losses in government popularity lead to gains in the opposition's popularity. In fact, there rather emerges a common movement up or down in certain periods (e.g. the early 1990's).

### 3.2. Tax burden

To gauge the German tax burden, we rely on quarterly data provided by the National Institute of Statistics (Statistisches Bundesamt) concerning total tax revenues in Germany over the period 1977:1-2003:4 (the most recent data available). To control for seasonal effects (which are strong given the specific way in which taxes are collected over the year in Germany), we concentrate on year-on-year deviations in real total tax revenues (in 2000 prices). These year-on-year tax revenue changes are

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post-1989 data do not straightforwardly allow constructing a general opposition-assessment, we rely on the data for the largest opposition partner after 1989.

portrayed in Figure 2. Before discussing this figure, one crucial caveat should be mentioned: viz. the tax revenue data refer to West-Germany up to 1990 and cover Germany entirely as of 1991. This change explains the steep increase in tax revenues in 1991 observed in Figure 2. However, since the tax revenue data thus do not refer to the same territorial area before and following 1991, the year-on-year change in these revenues cannot be evaluated in this year. Hence, we exclude 1991 from our later analysis (though we show the data here to preserve a complete picture of the taxation dataset).

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Figure 2  
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From Figure 2, it is clear that the growth in real tax revenues declined in the late 1970s and even became negative in the early 1980s. Still, most of the period up to the end of the millennium is characterized by marginal increases in tax revenues, with some obvious exceptions in, e.g., 1993 and 1997. These developments are clearly affected by the economic situation. For example, the economic downturns in the early 1980s and 1993 reduced real tax revenues. This economic effect will obviously need to be taken into account in the later analysis (cfr. Cameron, 1978; Garrett, 1988; Boix, 1998). Nonetheless, and importantly, German government tax policy decisions also affect the development of total tax revenues. For example, tax revenues decreased strongly in 2001. Data on German tax legislation indicate that this drop follows two years of particularly large numbers of new tax regulations, with an overall fiscal effect that the German Ministry of Finance estimated to be strongly negative (see Koester,

2006). A similar relation shows also, for example, for the 1997 drop in revenues (following new regulations in 1995 with expected negative fiscal effects) and the rebound in tax revenues in the early 1980s (following tax reforms with positive expected fiscal effects in 1981-82).<sup>6</sup>

One major advantage of our taxation dataset is that it allows us to separate the total tax burden between tax revenues at three levels of government: i.e. federal, state and local level. Specifically, the German federal government is responsible for ‘Gemeinschaftsteuern’ (66% of total revenues in 2004) and ‘Bundessteuern’ (19%). The former are taxes for which revenues are distributed across various levels of government although, in most cases, the federal government independently decides on the tax legislation (e.g. personal income and corporate taxes). The latter are taxes for which legislation and all revenues are the exclusive domain of the German national state (e.g. toll, alcohol and oil taxes). The state level in Germany determines the tax legislation and takes in all revenues for ‘Ländersteuern’ (5%) (e.g. inheritance taxes and beer taxes). Finally, ‘Gemeindesteuern’ (10%) are the exclusive responsibility – and revenue source – of the local governments (e.g. local property tax, taxes on second residences).

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<sup>6</sup> Overall, tax revenues are only weakly positively related to the lagged values of the Ministry’s estimated fiscal effects of tax reforms (see Koester, 2006). This does, however, not imply that tax policies have no or only marginal revenue effects. The reason is that the Ministry’s predictions are for the first 12 months of a regulation only (and thus ignore enduring fiscal effects). Moreover, they are likely to be imperfect estimations (to the extent that secondary effects such as crowding out or growth effects are hard to assess accurately in advance).

This separation of tax revenues according to responsible government level is presented in Figure 3 (once again in year-on-year changes in tax revenues). Importantly, this separation permits a first test of whether only federal-level tax revenues affect federal government (opposition) popularity or whether more local tax revenues (at the regional or municipal level) also lead to electoral retributions. The latter would suggest that voters are unable (or unwilling) to differentiate between tax burdens at various levels of government, implying obvious possibilities for strategic behavior of politicians (which may be important close to elections).

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Figure 3  
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All four series in Figure 3 seem to follow the general pattern discussed above. Nonetheless, the variation for most revenue sources is larger than that observed for overall revenues. Especially tax revenues at lower levels of government appear to be more volatile than tax revenue streams deriving from federal tax legislation. Moreover, even though the general pattern is similar for the four series in Table 3, the deviations around the trend do not always coincide. This leaves open the possibility that the different types of revenues have diverging effects in the later analysis.

#### **4. *Empirical Analysis***

##### **4.1. Specification**

Are taxes detrimental to German politician's popularity ratings? To answer this question, we estimate a government (and opposition) popularity function for Germany over the period 1978:1-2003:4.<sup>7</sup> In particular, our basic specification is:

$$P_t = a + b_1 P_{t-1} + b_2 X_t + b_3 REV_t + e_t$$

The dependent variable ( $P_t$ ) is the year-on-year change in the government's (or opposition's) popularity rating as defined in section 3.1.<sup>8</sup> We thus estimate the model in changes, rather than levels. Both types of estimation have been used in the prior literature and it is not clear a priori which one is to be preferred on a theoretical basis. In this paper, however, the estimation in changes is clearly desired due to the structure of the data (i.e. the need to define year-on-year deviations to correct for strong seasonal effects). As explanatory variables, our model first of all includes one lag of the dependent variable ( $P_{t-1}$ ). This picks up slow adjustment of political popularity ratings and also tackles the problem of autocorrelation that is present when this lag is not included. Slow adjustment of popularity ratings is a common finding in the literature and indicates the weight of past events on voters' decision-making process (e.g. Frey and Schneider, 1978; Kernell, 1978; Geys and Vermeir, 2006).

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<sup>7</sup> Data availability precludes us from starting prior to 1978. As mentioned before, 1991 is also removed from the sample. With the data points lost due to the inclusion of the lagged dependent variable, this leaves us with 94 observations for the overall sample.

<sup>8</sup> Alternatively, we define government (opposition) popularity as the share of people showing approval (+1 to +5) minus the proportion expressing disapproval (-1 to -5). This change in the dependent variable leaves the results of our analysis unaffected (full results available upon request).

Central to the analysis, as mentioned above, is a measure for total tax revenues ( $REV_t$ ). It is operationalised as the real year-on-year percentage change in total tax revenues (as depicted in Figure 2) or, alternatively, as the real year-on-year percentage change in tax revenues from the four taxation types distinguished in Figure 3. In line with findings in previous work (see section 2), we expect a higher tax burden to lower the government's approval ratings; i.e.  $b_3 < 0$ .<sup>9</sup> When any observed loss in government popularity translates into a gain for the opposition, a positive sign should be observed in the opposition's popularity function ( $b_3 > 0$ ). Importantly, however, as rational voters hold the government responsible only for taxation when it has a distinct influence on the tax burden (e.g. because it decides on the legislation for these taxes), this relation is expected to be constrained to 'Gemeinschaftssteuern' and 'Bundessteuern'. Indeed, since the other two types of taxation (i.c. 'Landessteuern' and 'Gemeindesteuern') are decided upon at lower levels of government, no effect of these revenues on federal government popularity is to be expected.<sup>10</sup>

Our vector of control variables,  $X_t$ , contains both economic and political controls. As economic variables, we include inflation (i.e. the year-on-year percentage change in

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<sup>9</sup> This assumes that the government is on average taxing on the left side of the Laffer curve (such that increasing tax rates increase revenues). This is not necessarily the case for all taxes. Increasing cigarette taxes, for example, tends to decrease revenues, but is nonetheless far from popular. Still, assuming the government is on the left-side of the Laffer curve is reasonable when regarding overall tax policies as in this study. We are grateful to Kai A. Konrad for this insight.

<sup>10</sup> When the state (or municipal) government features the same political parties as the federal government, voters' disapproval with local taxation might, however, 'spill over' to the federal government (affecting the federal government's popularity in these particular states). Unfortunately, our data do not allow us to test this proposition.

the Consumer Price Index) and the unemployment rate (i.e. the year-on-year deviation in the unemployment rate). Both are expected to lower the government's popularity and increase that of the opposition.<sup>11</sup> Still, though almost always included in studies of this kind, inflation may not be a crucial factor in Germany since the Bundesbank was a highly independent institution and strongly committed to its low-inflation target (Schächter and Stokman, 1995; Lohmann, 1998; Cusack, 1999). To the extent that voters acknowledge this central bank independence, they should not hold the government responsible for inflation. We also experimented with the inclusion of the year-on-year growth rate of real GDP. This, however, proved to be insignificant once unemployment is taken into account (though it consistently has the expected positive sign). Hence, given the strong relation between unemployment and real GDP growth ( $r = -0.57$ ), we exclude this variable from the final regression equations to avoid the apparent multicollinearity problems (results including GDP available upon request).

As political variables, we first include a set of administration dummies. Specifically, two dummy variables are included for governments headed by Helmut Kohl (1 between 1982:4 and 1998:3, 0 otherwise) and Gerhard Schröder (1 between 1998:4 and 2003:4, 0 otherwise). The reference category is Chancellor Helmut Schmidt. These variables attest of any Chancellor-specific effects on government popularity ratings. Our second political variable assesses the existence of a 'honeymoon' effect in government popularity. This relates to the period of goodwill that a government faces in the first quarters of its term, when post-election euphoria is still high and it is

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<sup>11</sup> Feld and Kirchgässner (2000) argue that hidden unemployment has an independent negative effect on government popularity during the Kohl government (1984-1996). Unfortunately, we lack

generally given the benefit of the doubt (Mueller, 1970; Smyth and Dua, 1989; Fox and Phillips, 2003). We measure this through a variable that is 4, 3, 2 and 1 in the second, third, fourth and fifth quarter of each administration respectively, and 0 in all other quarters (the first quarter of each government is dropped due to a lack of lagged dependent variable for those periods). The third political variable intends to capture so-called ‘pre-election rebounds’ in politician’s popularity. It has indeed often been argued that popularity ratings rebound prior to elections (generating an ‘election cycle’ in popularity; see e.g. Frey and Schneider, 1978; Nannestad and Paldam, 1994; Schmitt and Wüst, 2006). A possible reason is that party leaders are very active in this period to present themselves from their best side to convince voters of their abilities (Goodhardt and Bhansali, 1970; Cusack, 1999). We model this effect as a dummy equal to 1 in the election year, 0 otherwise.

Finally, we add a set of dummy variables to capture the effects of certain time-specific events. The fall of the Berlin Wall, for example, has been argued to have led to a (temporary) surge in government popularity (Cusack, 1999). We capture this euphoric period by a dummy variable equal to 1 in the period 1989:3-1990:1. More recently, a scandal over illegal party donations to the Christian-Democratic party (CDU) – uncovered at the beginning of the millennium – is argued to have aided the popularity of the ruling SPD-Green government in the first quarters of 2000 (Schmitt and Wüst, 2006). This boost in popularity was no doubt also supported by the federal government’s promise in January 2000 to ‘invest’ €125 million to aid the bailout of Germany's biggest construction company (viz. Philipp Holzmann A.G.), thereby

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similar data over our study period to assess whether this finding extends to a longer time period and different governments.

saving up to 70.000 jobs. We capture the effect of these events through a dummy variable equal to 1 in the period 2000:1-2000:3. Preliminary analysis also indicated significant outliers in the popularity series for other quarters (i.c. 1988:1, 1992:1, 1993:1, 1994:1, 1999:3-4; 2002:2, 2002:4). Dummy variables for these quarters were included in all analyses to control for any specific events causing a shock to popularity ratings in these periods. Summary statistics for all variables are presented in Appendix A.

## 4.2. Results

With time-series analyses such as this one, it is important to test assess the stationarity of the variables in the model since analyses involving non-stationary variables may lead to spurious inferences (Harris, 1995). Hence, we test for non-stationarity through augmented Dickey-Fuller unit-root tests. Following a general-to-specific rule described in Hall (1994) and Maddala and Kim (2004), we thereby start out with a large number of lags ( $k_{\max}$ ) and remove lags until the largest lag is statistically significant at conventional levels. To determine  $k_{\max}$ , we follow Schwert (1989) in setting it equal to the integer part of  $12.(T/100)^{1/4}$ , with T representing the number of observations. Consequently, as  $T = 94$  observations, we set 11 lags as the point of departure. Note also that inclusion of a trend variable and constant term in the test procedure was based on statistical significance of these variables. The reason is that including too many such ‘deterministic’ variables reduces the power of the test while incorrectly excluding them biases it in favour of the unit-root null hypothesis (Guilkey and Schmidt, 1991; Elder and Kennedy, 2001). The results of the unit root tests (presented in Table 1) indicate that all variables are stationary, with the exception of

inflation. As the first difference of this variable is stationary, we include inflation in first-differenced form in our regression model (implying we effectively include the first difference of the year-on-year change in the Consumer Price Index).

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Table 1  
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The results from the estimations are in Table 2. We provide three sets of results for both the government and opposition popularity ratings. Columns (1) and (4) show the basic results in which the taxation effect on popularity is estimated through total tax revenues. In Columns (2) and (5), we differentiate between the four different tax sources distinguished in Figure 3. Finally, Columns (3) and (6) present the results from a differentiation between expected and unexpected tax revenue changes (discussed more extensively below).

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Table 2  
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Before discussing the central – fiscal – variables, we briefly summarize the main findings with respect to our control variables. Firstly, for both government and opposition, the lagged dependent variable is highly statistically significant. Its value reveals that 55 to 60 percent of the change in the popularity rating persists into the subsequent period, indicating slow adjustment in political popularity. Secondly,

unemployment exerts a strong negative influence on government popularity. This, however, is not translated into a gain for the opposition. Inflation has only a marginal (and unexpectedly positive) effect on both government and opposition popularity. As mentioned, this might indicate that the electorate understands that the Bundesbank – being highly independent and committed to its inflation target – rather than the government is to be held responsible for inflation.

The political variables in the model mostly confirm earlier findings. First, the highly significant positive honeymoon effect shows that the public's endorsement of the government is higher in the first quarters of its term (cfr. Mueller, 1970). No such honeymoon effect exists in the opposition rating. This is not surprising since there is no reason to be – even temporarily – euphoric about parties that have not made it into the government. Although this is also not substantiated in our data, one might rather have expected the reverse (i.e. a 'divorce period'). Second, there is a statistically significant pre-election rebound. Interestingly, this holds for both government and opposition, though it is stronger for the former. Apparently, both government and opposition make an extra effort to appeal to the public in the run-up to elections – and succeed in gaining some popularity from this. Third, the fall of the Berlin wall created a significant boost in the popularity of the German government. This breakthrough was apparently perceived as a success of the government only since the opposition failed to gain any popularity from it. The other time-specific effects included in the regression (not reported individually) are individually and jointly highly significant, indicating the importance of including these elements to avoid misspecification. Finally, the administration dummies are jointly insignificant in all

specifications, such that Chancellor-specific effects on government popularity appear to have been at best rather weak (*ceteris paribus*).

Turning our attention to the tax variables, the results provide clear support for the negative impact of taxation on government popularity (column (1)). This is in line with the findings of, among others, Niskanen (1975; 1979), Peltzman (1992), Cuzán and Bundrick (1999) and Geys and Vermeir (2006) and extends the finding for Germany in Cusack (1999) beyond income taxation. Specifically, a one standard deviation change in tax revenues (i.e. 4%) alters the share of respondents that have a positive evaluation of their government with approximately 1.56%. Column (4) shows that this loss of government popularity does not benefit the opposition. In fact, even the opposition appears to lose from an increasing tax burden (though not significantly so). One possible explanation for this negative opposition effect is that the opposition may be deemed incapable of preventing tax increases (leading to some popular retribution or dissatisfaction with its performance).

Distinguishing between four tax revenue streams (related to the level of government that is accountable for them; see above) in Columns (2) and (5) indicates that not all taxes matter equally. In line with expectations, the federal government is only punished for taxes that derive from federal tax legislation and accrue (at least in part) to the federal government. That is, while ‘Gemeinschaftssteuern’ and ‘Bundessteuern’ significantly depress government popularity, the effect of taxation at lower levels of government is statistically insignificant (and even positively signed). The model for opposition popularity reveals that the opposition is only punished for ‘Bundessteuern’

– thereby once again indicating that a loss in government popularity from taxation issues does not appear to help the opposition, rather the reverse.

Finally, as mentioned before, tax revenues are influenced by both the economy and taxation policy. Hence, in Columns (3) and (6), we separate these effects using a two-stage estimation procedure proposed by Besley and Case (1995). Specifically, we first run an auxiliary regression in which we relate tax revenue changes to lagged tax revenues changes and current values for GDP growth.<sup>12</sup> Then, the predicted values from this auxiliary regression (or the ‘expected’ tax revenue changes based on past changes and current economic events) and the residuals (or ‘unexpected’ tax revenue changes, which tap into changes due to legislative actions) are added to the popularity function. One caveat of this procedure should be mentioned. Though this separation has clear theoretical merit, its empirical foundation is somewhat weaker. Firstly, it assumes voters’ understanding of the underlying effect of economic variables on fiscal outcomes *and* their ability to distinguish between both effects. This appears, at best, implausible (see also Besley and Case, 1995). Secondly, voters may simply *want* to punish unfavourable fiscal outcomes independent of their cause (i.e. economic or tax legislation).

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<sup>12</sup> The results from this first stage regression are:  $\Delta \text{Taxrev}_t = -0.003 + 0.552 \Delta \text{Taxrev}_{t-1} + 0.005 \text{GDPgrowth}_t$ . The coefficient estimates for both the lag of (year-on-year change in) tax revenues and GDP growth are statistically significant beyond the 1% confidence level. Note also that inclusion of unemployment and inflation turned out insignificant and were not retained in the final version of the (first-stage) model. This indicates – in line with findings by Koester (2006) – that the main economic determinant of tax revenues is economic growth.

Keeping this caveat in mind, the results show that there is no significant difference between the effects of ‘expected’ and ‘unexpected’ fiscal outcomes on government popularity (column (3)). In fact, both coefficients are almost the same and, as shown by the F-test at the bottom of Table 2, statistically indistinguishable. This is not the case for the opposition’s popularity (column (6)). The opposition benefits (though insignificantly so) from unexpected changes in tax revenues, but loses popularity with tax revenues changes that are expected based on economic and past trends. One tentative explanation for these findings may be that ‘unexpected’ changes lead to sudden popular resentment and the cry for a change in political leadership, which leads to decreasing government popularity and increasing opposition popularity. This sudden surge in resentment is absent for ‘expected’ changes, and both government and opposition suffer equally (the coefficients are statistically indistinguishable;  $F_{1, 75} = 0.73, p < 0.10$ ).

## **5. Conclusion**

The literature on VP-functions shows that taxation often has an important effect on the popularity ratings and re-election odds of politicians. The present paper has provided an extensive re-analysis of various hypotheses raised in this previous literature using German data. Given the near-exclusive reliance in previous studies on US or UK data, such an extension of the literature to other countries is warranted to provide a more general outlook on the effect of taxation on popularity ratings (and election results).

The results allow us to formulate four conclusions. Firstly, taxation significantly reduces government popularity in Germany over the period 1977-2003. There thus is a clear disciplining reaction of voters towards governments that increase the tax burden. Secondly, this effect is *not* translated in an opposite reaction to opposition parties. The opposition generally fails to gain from popularity losses of the government – both when it comes to taxation as with regard to other economic events such as unemployment. Thirdly, voters appear to behave rational in assigning blame only for tax revenues that are under the direct influence of the federal government (i.e. Gemeinschafts – and Bundessteuern). They do not punish the government for a tax burden imposed by a lower level of government. Finally, voters do not distinguish between tax revenue increases due to economic growth and those deriving from legislative changes. This may indicate bounded voter rationality in the sense that voters are probably unable to make a clear distinction between the various sources of tax burden increases – and therefore punish the politicians equally for all increases. Overall, it is clear that taxation matters. People dislike taxation and are willing (and capable) to show this resentment, leading to reduced popularity of the politicians deemed responsible for a higher tax burden.

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## Appendix A: Summary statistics

Table A1: Summary Statistics

<b>Variable</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Government Approval (year-on year change)	-1.239	11.67	-24.63	25.40
Opposition Approval (year-on year change)	-0.209	7.76	-24.50	16.83
GDP Growth	1.725	2.26	-2.76	7.35
Inflation	2.516	1.78	-0.95	7.13
Unemployment (year-on year change)	0.049	0.14	-0.15	0.53
Tax Revenues (year-on year change)	0.014	0.04	-0.08	0.14
Gemeinschaftssteuern (year-on year change)	0.014	0.04	-0.11	0.10
Bundessteuern (year-on year change)	0.024	0.11	-0.29	0.52
Laendessteuern (year-on year change)	0.010	0.07	-0.17	0.21
Gemeindesteuern (year-on year change)	0.004	0.07	-0.26	0.21
Honeymoon	0.213	0.77	0	4
Election year	0.277	0.45	0	1
Wall down	0.032	0.18	0	1

Figure 1: Popularity of German government and opposition: 1977:1-2003:4 (%)

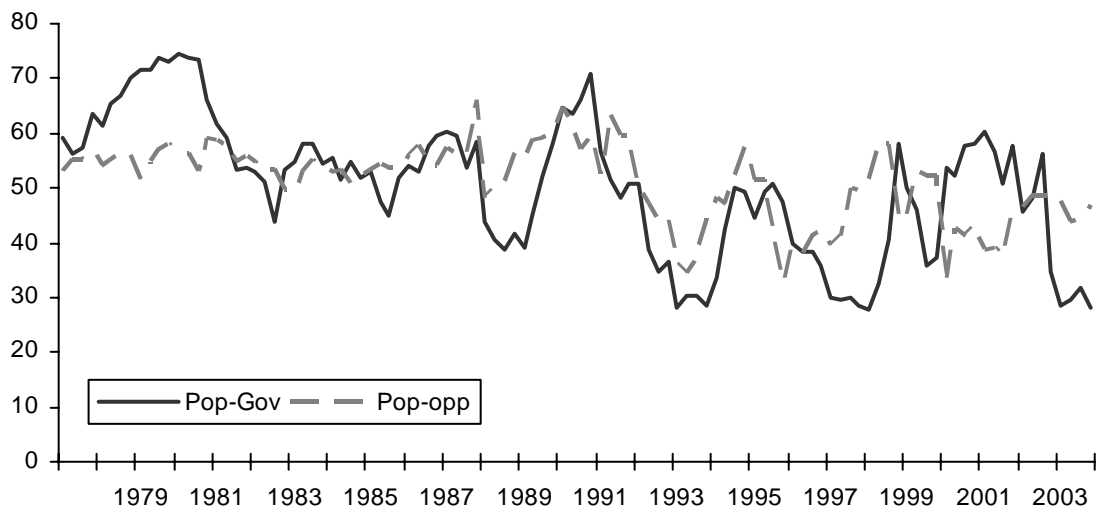


Figure 2: Year-on-year change in real total tax revenues: 1977:1-2003:4 (%)

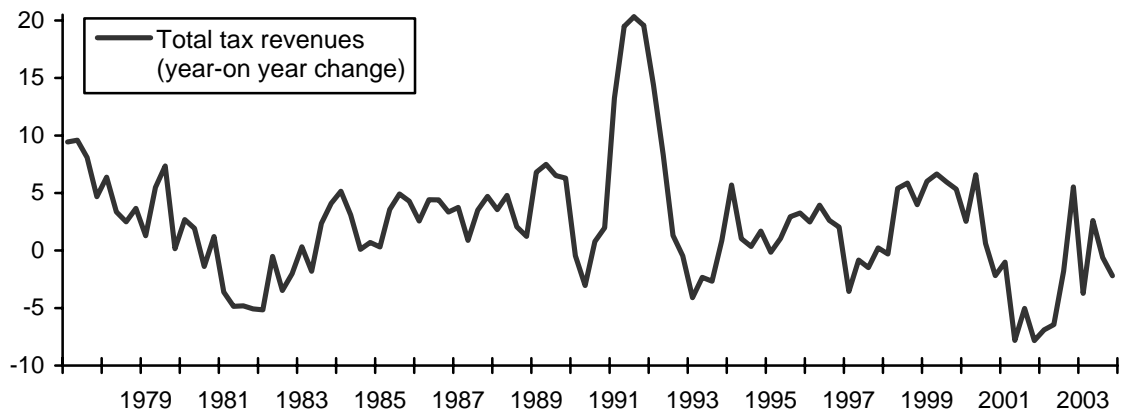


Figure 3: Year-on-year change in real total tax revenues at different government levels: 1977:1-2003:4 (%)

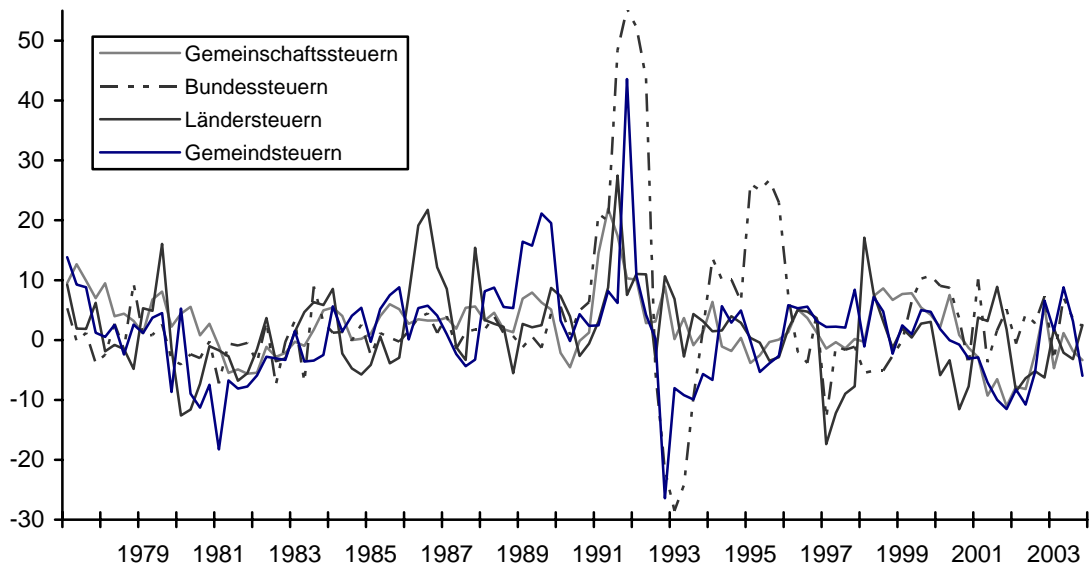


Table 1: Results from unit-root tests (using Augmented Dickey-Fuller tests)

Variable	# lags	$\tau_{\mu}$	Inference
Government Approval <sup>b</sup>	9	-4.51***	Stationary
Opposition Approval <sup>b</sup>	9	-3.97***	Stationary
Tax Revenues <sup>c</sup>	4	-3.69***	Stationary
Gemeinschaftssteuern <sup>b</sup>	4	-2.95***	Stationary
Bundessteuern <sup>b</sup>	10	-1.98**	Stationary
Landessteuern <sup>b</sup>	8	-2.22**	Stationary
Other tax revenues <sup>b</sup>	11	-2.46**	Stationary
Unemployment <sup>b</sup>	1	-3.22***	Stationary
Real GDP growth <sup>c</sup>	3	-3.28***	Stationary
Inflation <sup>a</sup>	9	-2.70	Unit root
Inflation, first differences <sup>b</sup>	11	-3.63***	Stationary

Note: Critical values  $\tau_{\mu}$  are in Fuller (1976). We use interpolated critical values as provided by Stata. Inclusion of a drift parameter (or constant term) and time trend were based on statistical significance of these variables. Superscript <sup>a</sup> refers to inclusion of both constant and time trend, superscript <sup>b</sup> indicates the absence of both while superscript <sup>c</sup> implies inclusion of a constant term only.

Table 2: Determinants of German government and opposition approval ratings 1977-2003

	(1) GOV	(2) GOV	(3) GOV	(4) OPP	(5) OPP	(6) OPP
Intercept	-3.255 * (-1.83)	-2.283 (-1.18)	-3.314 * (-1.78)	-2.062 (-0.99)	-1.123 (-0.51)	-0.711 (-0.34)
Approval (t-1) (year-on-year change)	0.565 *** (9.59)	0.579 *** (8.69)	0.565 *** (9.52)	0.551 *** (5.93)	0.589 *** (6.34)	0.552 *** (6.11)
Unemployment rate (year-on-year change)	-16.216 *** (-2.75)	-16.057 ** (-2.55)	-15.907 ** (-2.44)	-0.877 (-0.15)	-0.416 (-0.07)	-7.546 (-1.20)
Inflation rate (first difference)	2.144 * (1.74)	1.973 (1.54)	2.158 * (1.73)	2.222 (1.50)	2.101 (1.43)	1.872 (1.29)
Tax Revenues (year-on-year change)	-40.376 ** (-2.01)	-	-	-3.944 (-0.17)	-	-
Unexpected Tax Revenue Change	-	-	-41.406 * (-1.85)	-	-	21.776 (0.87)
Expected Tax Revenue Change	-	-	-37.778 (-1.24)	-	-	-63.961 * (-1.88)
Gemeinschaftssteuern (year-on-year change)	-	-44.191 ** (-2.39)	-	-	-14.432 (-0.69)	-
Bundessteuern (year-on-year change)	-	-11.507 * (-1.68)	-	-	-19.458 *** (-2.69)	-
Laendessteuern (year-on-year change)	-	11.840 (1.43)	-	-	15.584 (1.67)	-
Gemeindesteuern (year-on-year change)	-	4.653 (0.47)	-	-	12.414 (1.15)	-
Honeymoon	2.867 *** (3.34)	2.812 *** (3.13)	2.863 *** (3.31)	0.026 (0.03)	-0.004 (-0.01)	0.045 (0.05)
Election year	6.580 *** (4.64)	5.934 *** (4.05)	6.587 *** (4.61)	3.616 ** (2.04)	2.819 (1.62)	3.380 * (1.96)
Wall down	10.699 *** (3.64)	9.142 *** (2.84)	10.632 *** (3.52)	2.548 (0.74)	0.299 (0.08)	4.032 (1.19)
F (Event dummies)	14.79 ***	14.68 ***	14.06 ***	2.68 **	3.35 ***	2.58 **
F (Administrations)	2.31	1.79	2.15	0.43	0.21	0.62
R <sup>2</sup> adj	82.97	83.10	82.75	47.87	51.70	50.82
Breusch-Godfrey	0.18	0.20	0.16	0.09	2.31	0.07
Heteroscedasticity	0.37	0.36	0.40	1.88	2.51	1.41
RESET <sup>3</sup>	1.31	1.23	1.32	1.67	3.16 **	1.45
F (exp = unexp)			0.01			5.55 **

Note: N = 94. t-values between brackets. \*\*\* significant at 1%; \*\* at 5% and \* at 10%. F(Event dummies) tests joint significance of time-specific event dummies, F(Administrations) tests for administration specific effects in popularity, Breusch-Godfrey and Heteroscedasticity test for autocorrelation and heteroscedasticity respectively. RESET<sup>3</sup> is Ramsey's (1969) specification error test. F (exp = unexp) tests difference of the coefficients for expected and unexpected tax revenue changes.