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Research Article

The R-G Differential: A Policy Instrument for German Federal States to Explore Fiscal Policy Potentials?

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Abstract: This paper examines the role of the R–G Differential—the gap between interest rates (R) and economic growth (G)—as a fiscal policy instrument for Germany's Federal States. While widely studied at the national level, its implications for subnational fiscal sustainability remain underexplored. Building on Domar's debt dynamics framework, the study calculates state-level R–G Differentials using official budget data from 2013–2023 and classifies states into three distinct fiscal groups. Results show that most Federal States (Länder) experienced periods of $r < g$, indicating favourable conditions for debt sustainability, yet this potential has not been systematically integrated into fiscal planning. The findings suggest that the R–G Differential could serve as a complementary benchmark to existing fiscal rules, enhancing medium-term planning and resilience under the constraints of Germany's debt brake and EU fiscal framework. The paper concludes that incorporating R–G monitoring into Federal State-level reporting would not only improve transparency and comparability but also support a more nuanced, forward-looking approach to fiscal policy.

Keywords: Fiscal Policy, Sustainable Debt, Stability Council, Primary Balances, Domar-Model, German Federalism

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Highlights:

- Demonstrates that favourable R–G conditions allow higher expenditures, including for growth-oriented policies, without necessarily conflicting with debt brakes or fiscal sustainability.
- Positions the R–G Differential as a practical monitoring tool, offering early warnings on the sustainability of fiscal paths and the justification for debt-financed investments.
- Highlights the value of embedding rolling R–G projections into annual budgets to anticipate fiscal pressures and seize policy opportunities.
- Proposes forecast-based integration of r and g estimates into ex-ante budget planning, enabling a probabilistic and adaptive fiscal framework towards sustainable public households.

1. Fiscal Policy challenges on several levels

Fiscal policy on German national and Federal State level (Länder) received higher focus in recent years as a result of rising public interest and changes made within the German Constitution. In addition, low nationwide economic growth across all federal levels paired with increasing demands in public spending, especially into the social system, accelerates the pressure for the government and stresses the public households on all levels. Hence, fiscal policy makers are set out to identify and implement sufficient measures as respond to global crises, to define the path for future-oriented public investments as well as to ensure sustainable and reasonable public spending with focus on stable public debts. This is particularly paramount in the context of the debt brake (Buettner, 2022a), which is anchored in the Article 109 of the German Constitution, but was adjusted at the beginning of the year 2025. Previously, fiscal policy should aim at achieving balanced households without creating new credits or debts, even though the debt brake is determined slightly different on Federal State level: while the national household is allowed an annual net credit borrowing of 0.35% of nominal GDP, the Federal States had no leeway in net credit borrowing / structural deficit under the old regulation (Waldhoff, 2024). However, a recent amendment of the German Constitution has introduced greater flexibility for the Federal States. Under the new provision, they are now permitted limited structural deficits under specific conditions, such as economic downturns or exceptional emergencies. This change is intended to enable more responsive fiscal policy at the state level, particularly in times of crisis, while still maintaining the core principles of the debt brake. Nonetheless, the original rule — that the Federal states should operate without structural deficits under normal circumstances — remains the baseline framework, and the amendment merely introduces conditional exemptions rather than eliminating the restriction altogether (Deutscher Bundestag, 2025).

However, even after changes have been made, the debt brake is constantly under political discussion on all levels as it — amongst others — still limits the space for fiscal policy to respond to increasing environmental and societal challenges (Feld & Reuter, 2022; Schmidt, 2020) as well as the growing pressure to increase spending for national defence (Zettelmayer, 2025). More precisely, urgent investments for future generations should be financed through debts today in case their returns will occur in future as well, the so-called pay-as-you-use principle (Fenge, 2021).

Contrariwise, higher public debts are associated with lower economic growth, what, in turn, may justifies this restricting instrument for public debts in fiscal policy (Herndon et al., 2014). However, the effect of public debt on growth is highly context-dependent, varying by state and over time. More recent research (Heimberger, 2023) underlines the absence of consistent evidence for universally negative debt-growth link. Further reforms of the debt brake are to be investigated by a recently appointed commission of experts. However, current representatives of the Federal States are not included in this commission at all.

So far, setting up special budget reserves for defined necessities with additional debts as an exemption of the debt brake or outside of the main public households became a more common policy instrument for the German Government on national and state level (Buettner, 2022b). Indeed, one of those recent budget reserve set-ups was under discussion at the highest national court. As a consequence, the decision of the Federal Constitutional Court regarding unconstitutionality of the public climate and transition fund brought up new fiscal challenges, with currently unknown consequences both to the national and to Federal State level (ref. to BVerfG, 2023). In general, the sustainability of both public budgets and public debts are increasing in terms of central importance and shall comply with the EU's Fiscal Rules (Larch et al., 2023).

Picking up the new EU Fiscal Rules within the Stability and Growth Pact, all Member States have to adopt the novel regulations implemented on 30th April 2024. They are driven by certain safeguards. To ensure that structural debt is below 60% of the public debt GDP ratio, annual decreasing ratio is set by either 0,5% or 1% depending on the actual debt ratio (debt sustainability safeguard). In addition to the limiting structural government deficit by 3% of the GDP, a fiscal buffer margin as of 1,5% is emphasised (deficit resilience safeguard) (European Commission, 2024). In German federal system, structural government debt includes all state levels - namely national government, states and municipalities – as well as social insurances. Therefore, the Federal States are directly involved in complying with the new EU rules, which increase the necessity and importance to investigate sufficient solutions for fiscal policy on this specific level.

Besides the Fiscal Policies within the SWP, the European Commission (2021) has also developed a three-stage concept (S0, S1 and S2) with indicators for sustainability of public debts. Stage S0 covers 25 indicators on short-term financing. Stage S1 follows the Maastricht Treaty and specifies a debt ratio limit for explicit debt of 60% referring to the respective GDP of EU Member States. However, Stage S2 presupposes stability of the current debt ratios in public households and assumes $r > g$, whereas r refers to the mean interest rate on public debts and g refers to the nominal economic growth rate, the so-called R-G Differential. Moreover, Stage S2 implies implicit debts formed from the present value of future additional expenditures due to demographic development under the “no policy change” assumption, which postulates no political and / or structural changes are made compared to the status quo. By doing so, Stage S2 also indirectly assumes that the present value of future primary balances from the state budget must be greater than the current debt. This European definition of S2 also act as a basis for sustainability reports on public debts being published by the German Federal Ministry of Finance (BMF, 2020; Werding et al., 2020). Here, a constant debt ratio is a main integral part of the yearly stability reports on national and Federal State level, who provide an assessment towards the public households' compliance with debt brake and balanced public budgets (Korioth, 2016).

The condition $r > g$, as accepted in the S2 definition, has been regarded as an axiom within research on public debts accepted in scientific and practical discourses since 1990, mainly based on the OECD publication (Blanchard et al., 1990). The opposite relationship $r < g$ was only seen as a pure theoretical construct connected with the so-called Ponzi-financing, which describes a process, by which debts, including their interest rates, are repaid by borrowing new debts (sometimes also referred to as a snowball system) (Escolano, 2010). Blanchard (2001) himself later stated that the relationship $r < g$ actually exists empirically and Ponzi-financing does not have to exist under this condition. Moreover, this research discussion and scholarly perspective brought a new meaning: in the longer-term $r < g$ applied in the OECD countries even has a welfare-increasing effect (Blanchard et al., 2023) and offers the possibility to grow out of the debt ratio problems. It is only reversed by exogenous shocks (European Commission, 2022). Furthermore, economists now describe the relationship $r > g$ as an unfavourable condition in the context of public debts and fiscal policy (Di Serio et al., 2021; Heimberger, 2023).

Similarly, the “no policy change” assumption within S2 is also criticised and considered as unrealistic one having in mind the long-term forecast within this definition. Even if additional demographic costs would be financed by loans in the future, this action would be a political intervention due to the necessary decision on the part of the legislator, which reduces the “no policy condition” to absurdity (Priewe, 2023).

Even though Federal States operate under largely homogenous borrowing conditions in the federal bond market and thus share similarities in the “ r ” component of the R-G differential with the national level, there are several important reasons why an empirical assessment at the subnational level is not only meaningful but also necessary for fiscal policy debates. First, economic growth trajectories (the “ g ” component) differ substantially across states, reflecting heterogeneous demographic developments, industrial structures, and regional economic resilience (see Ragnitz & Röhl, 2021). These structural divergences imply that the debt sustainability outlook, even under similar financing conditions, can vary considerably between states. A given federal interest rate environment can therefore lead to different dynamics in debt ratios at the state level, especially where weak growth coincides with above-average fiscal stress.

Second, the institutional framework of fiscal federalism in Germany requires state-specific monitoring of fiscal sustainability. Since the 2009 federalism reform, the states are subject to the debt brake, and since the 2025 constitutional amendment they are allowed limited structural deficits only under well-defined circumstances. Compliance is monitored jointly by the Stability Council (Stabilitätsrat), which explicitly conducts state-level sustainability assessments (Korioth & Wernsmann, 2012; Deutscher Stabilitätsrat, 2024). The Council currently relies mainly on traditional budgetary indicators (e.g. structural balance, debt-to-GDP ratio, liquidity indicators). However, as the r - g discourse shows, long-term debt sustainability cannot be adequately assessed by nominal debt ratios alone. The integration of the R-G differential into the set of monitoring indicators could therefore enhance the analytical depth of fiscal surveillance in Germany and support more forward-looking policymaking (see also Feld & Reuter, 2022). Moreover, it will give an incentive to enhance the growth rate of state.

Third, EU fiscal rules—particularly under the reformed Stability and Growth Pact of 2024—apply to the general government sector as a whole, which in Germany includes the states (European Commission, 2024). Because the fiscal stance of the federal level cannot be isolated from that of the subnational level, State-specific trajectories of the R-G Differential are crucial for understanding whether Germany can credibly comply with the EU's debt sustainability safeguards in the medium term. The States's fiscal paths thus directly shape Germany's aggregate compliance and credibility in European fiscal governance.

Picking up the newly emerged perspectives regarding the relationship of r and g , it is worth analysing new potentials for fiscal policy and decision-making regarding public households on Federal State level. Moreover, such an analysis might open up cross-linkages to the discourse on complying with the debt brake or maintaining constant debt ratios. Against this background, and to further investigate the sustainability of debts in the fiscal policy nexus, recent research literature recommends conducting empirical studies within clearly delineated regional or economic contexts (Kaur et al., 2022). While the states provide valuable insights, they cannot be treated as a single homogeneous economy, given their

divergent growth trajectories and fiscal capacities. Hence, any analysis at this level must carefully account for these differences to avoid overstating the comparability of results. Nevertheless, the states are bounded on political, social and economic level.

Hence, the paper in hand analyses the R-G Differential of recent years for the Federal States of the German Federal Republic based on their yearly household balance sheets. This allows to investigate the relation between r and g . The aim of the conducted research is therefore to empirically proof the condition $r < g$ on Federal State level, to contribute to the overall R-G Differential discourse as well as to cross-link it to fiscal policy decision-making in the context of the debt brake and constant public debt ratios. Moreover, policy recommendations shall be developed to deploy gained insights for the purpose to rethink or critically evaluate fiscal policy as a response to future-oriented policy-making.

The paper is structured as follows: the upcoming section presents a basic model of the R-G Differential. Afterwards, implemented research methods and used data are described, results of the analysis in all 16 German Federal States are presented consequently. The paper concludes with a discussion on possible fiscal policy implications as well as a short outlook on potential research in this particular field.

2. The Domar-Model

As aforementioned, the debt ratio is a central indicator for fiscal policy and lays the groundwork for future design of public budgets at European, German and Federal State level. To illustrate the relationship between debt ratio and R-G Differential, the model of Domar (1944) is applied in the present research. This model is still used to analyse governmental spending stability conditions today (Heimberger, 2023; Pedrosa et al., 2023).

Here, the debt ratio is expressed as d_t , where t is the year under consideration. The debt ratio is calculated as a share of total public debts within the nominal GDP. The primary balance p_t , is defined as a relation between the difference of tax revenues and government expenditure excluding those on debt interests and the nominal GDP.

Thus, according to the model, debt ratio for year t is calculated by following equation:

$$d_t = d_{t-1} + \frac{r-g}{1+g} d_{t-1} - p_t \quad (1)$$

As equation (1) shows, the debt ratio for year t is calculated by the debt ratio of year $t-1$ as well as its new indebtedness considering the interest payments, nominal economic growth and primary balance. Consequently, the change in the debt ratio between both years can be written as follows:

$$d_t - d_{t-1} = \frac{r-g}{1+g} d_{t-1} - p_t \quad (2)$$

Using equation (2) it is possible to make statements about the change in the debt ratio solely by means of the two terms on the right-hand side of the equation. However, considering the assumption of a constant debt ratio ($d_t - d_{t-1}$), the left-hand side of equation (2) must be zero. Consequently, an equilibrium primary balance p_t^* can be written as follows:

$$p_t^* = \frac{r-g}{1+g} d_{t-1} \quad (3)$$

This equation (3) might be able to shape fiscal policy, taking into account the Federal State's own debt ratio and the goals attached to it (e.g. debt reduction). It should be noted that both r and g are exogenous in the short run. Political actions might influence the mean interest rate on loans, but it tends to have long maturities. Loans borrowed in year t have no influence on the interest rate in the same year. Economic growth g is subject not only to fiscal but also to monetary, structural and growth policy trends. In addition, affects can be associated with many other economic and political factors, which have an impact but cannot be directly influenced in the short term by policy-making.

Hence, the primary balance p_t remains as a fiscal policy instrument. Depending on the surplus or deficit and the relationship between r and g , the debt ratio can be actively influenced. With a constant debt ratio, there must be a primary surplus if $r > g$, while the ratio $r < g$ allows a primary deficit without increasing public debts' ratio. In other words, an analysis of the relation between r and g might opens up new horizons for fiscal policy-making in the short term through higher public consumption expenditures or public investments being reflected in a primary balance deficit.

3. Data & Methodology

The conducted research uses empirical data to analyse the R-G Differential based on the introduced Domar-Model. Economic growth, mean interest rate as well as the primary balance are the main indicators under investigation. As the research is focusing on the German Federal States in terms of geographical research scope, all three indicators were gathered covering a period between 2013 to 2023 (latest publicly available data in states' balance sheets). Hence, on average, the conducted research is covering at least two political terms in the states, which includes political (party) changes implicitly. The economic growth rate is publicly available through Statista and Eurostat databases. As a main source of empirical data, the annually published household balance sheets of the Federal States have been used. Here, the primary balance is listed directly, whereas the mean interest rate on debts was calculated using the ratio of annual interest spending to the total amount of public debts. The latter has been put into relation with the state's GDP from the Eurostat database for the same year to calculate the debt ratio for each Federal State.

Two more remarks on the used data must be made. Firstly, as a consequence of the research method, only explicit debts are analysed in the conducted research. Implicit debts such as potential pensions are not part of this research. Secondly, the debt of city states includes the debt of its municipalities, thus, city state debt tends to be higher. However, as the interest spending of municipalities is also integrated on city state level, no distortion is expected and the comparison across all states is valid.

Necessary calculations based on the household balance sheets have been done for all Federal States except Rheinland-Pfalz and Berlin, as both states do not publicly publish their balance sheets. Moreover, during the realised research in Q4/2024 to Q2/2025, in some cases the necessary data was not publicly available for the year 2013.

The German Federal States serve as case studies, whereas highly exploratory research can be especially associated with the documentary analysis, being applicable for undiscovered or new aspects (Bartlett & Vavrus, 2017; Borrego et al., 2007; Shields & Rangarajan, 2013). In this vein, the conducted research builds upon the understanding of cases studies under investigation, which represent a phenomenon in real life context with unknown relationship and little control by the researcher (Yazan, 2015; Yin, 2018).

As the quantitative and empirical research path utilises open accessible data, the criteria on the data to be valid, reliable, replicable and generalisable (Bryman et al., 2008) are fulfilled from the authors' perspective. As a result, the comprehensive research was undertaken to the best of researchers' knowledge considering research ethics. As the used data is available in open access form, it is accessible to any person with interest.

4. Results for the R-G Differential in German Federal States

Figure 1 illustrates the results of conducted analysis for each Federal State in Germany individually. Development of the economic growth is shown in red and the mean interest rate on debts in green (both left scale), alongside with the primary balance for each year in light-blue (right scale). The favourable condition $r < g$ is highlighted by black circles. As mentioned above, data is missing or not accessible for the Federal States of Rheinland-Pfalz and Berlin, thus, both states are excluded from further analysis. Table 1 illustrates the calculated R-G Differential for each German Federal State for easier access to the annual R-G Differential for all states. Negative relations are highlighted in green showcasing the preferred condition $r < g$. Reviewing the data, some common findings can be formulated as follows:

1. The mean interest rate for public debts is relatively stable and decreasing over time (the year 2020 indicates a moderate outlier only). This has three main reasons. First, the Federal States debt portfolio often consists of a quite high share of long-term loans with constant interest rates. Second, due to a long time of a relatively low-key interest rate, public households were able to acquire new debts with lower interest rates, which also have been used to amortise older debts with higher interest rates. Third, the debt brake is implicitly reducing the burden of debts in public households.
2. Overall, the economic growth rate is relatively volatile over time but remains mainly positive in all Federal States. However, in recent years a clear downturn can be recognised as a consequence of the overall path towards a recession in Germany.
3. The Corona crisis is causing the relation $r > g$ in all analysed Federal States for 2020. This supports the finding that exogenous shocks are necessary to invert the R-G Differential (European Commission, 2022; Di Serio et al., 2021).
4. As Figure 1 illustrates, during analysed period the relation $r < g$ cannot be empirically confirmed for all German Federal States. The volatile development of the economic growth and quite constant debt interest rates divide the Federal States into three categories:
 - i. Negative R-G Differential ($r < g$): Brandenburg (BB), Hessen (HE), Nordrhein-Westfalen (NW) and Sachsen (SN).
 - ii. Alternating R-G Differential ($r < g$ and $r > g$): Baden-Württemberg (BW), Bayern (BY), Hamburg (HH), Mecklenburg-Vorpommern (MV), Niedersachsen (NI), Sachsen-Anhalt (ST), Schleswig-Holstein (SH) and Thüringen (TH).
 - iii. Positive R-G Differential ($r > g$): Bremen (HB) and Saarland (SL).
5. In majority of the analysed Federal States, the primary balance as identified policy instrument is not linked to the relation of the R-G Differential nor its potential room for fiscal policy-making on German Federal State level as indicated in the Domar-Model.
6. Despite the three identified groups of the Federal States in terms of the R-G Differential, the politically favourable relation of a negative R-G Differential ($r < g$) prevails across all Federal States in the analysed time period as Table 1 showcases (negative relations marked in green). This perspective becomes even more explicit if the year 2020 of Corona crisis is not included into the analysis.
7. In addition, Figure 2 illustrates a map of cumulated R-G Differentials for all analysed regions, providing a total value as sum of the Differentials for each state alongside the analysed decade. The total values are underlining the division into three groups as listed under number four above.

From a theoretical point of view and according to the applied Domar-Model, the first group (I) with a negative R-G Differential would be able to preserve a constant ratio even in case of negative primary balances due to higher public expenditures. Or in other words, theoretically, these Federal States are not fully exploiting their fiscal policy potentials.

Table 1. R-G Differential between 2013 and 2023 in German Federal States (own calculation, negative values highlighted in green colour).

State	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
BB	-0,22%	-2,82%	-0,33%	-1,21%	-2,83%	-1,04%	-2,77%	4,37%	-0,57%	0,52%	2,42%
HB	2,32%	-0,10%	0,57%	-0,03%	-0,40%	1,26%	2,28%	7,69%	-2,77%	-1,20%	3,50%
HH	-0,93%	0,75%	-1,75%	0,48%	-3,53%	-0,12%	-2,42%	7,88%	0,86%	-1,78%	6,00%
BW	0,00%	-0,76%	-1,46%	0,59%	-1,76%	-0,94%	0,92%	7,75%	-2,83%	-0,12%	2,98%
BY	1,30%	0,01%	0,24%	-0,37%	-1,23%	0,63%	-1,88%	6,55%	-2,15%	0,01%	2,18%
HE		-1,68%	-0,17%	-2,13%	-1,38%	-0,39%	-1,65%	6,76%	-3,18%	-0,67%	0,62%
MV	0,27%	-1,36%	1,33%	0,20%	-5,06%	2,24%	-4,84%	6,09%	0,31%	0,31%	1,12%
NI	1,62%	-1,91%	1,44%	-5,25%	-0,70%	-1,59%	-2,75%	5,20%	-0,84%	1,82%	-0,38%
NW	0,82%	-1,37%	-0,90%	-0,59%	-2,09%	-1,86%	-0,64%	4,49%	-1,21%	0,57%	3,08%
ST		0,60%	0,77%	-0,24%	-1,01%	-0,04%	-2,47%	4,93%	0,20%	1,64%	4,11%
SH	1,42%	-0,68%	0,16%	-0,92%	-4,01%	-0,89%	-3,56%	3,48%	1,48%	-0,17%	2,03%
SL	4,70%	-1,22%	0,97%	2,31%	-0,26%	1,17%	2,56%	7,84%	0,23%	2,30%	5,41%
SN	-0,16%	-2,75%	-2,03%	-1,56%	-2,36%	-1,29%	-3,00%	4,79%	-2,09%	-1,54%	0,38%
TH	-0,42%	-1,78%	0,88%	0,09%	-1,20%	0,46%	-0,43%	6,03%	-2,00%	0,12%	1,67%

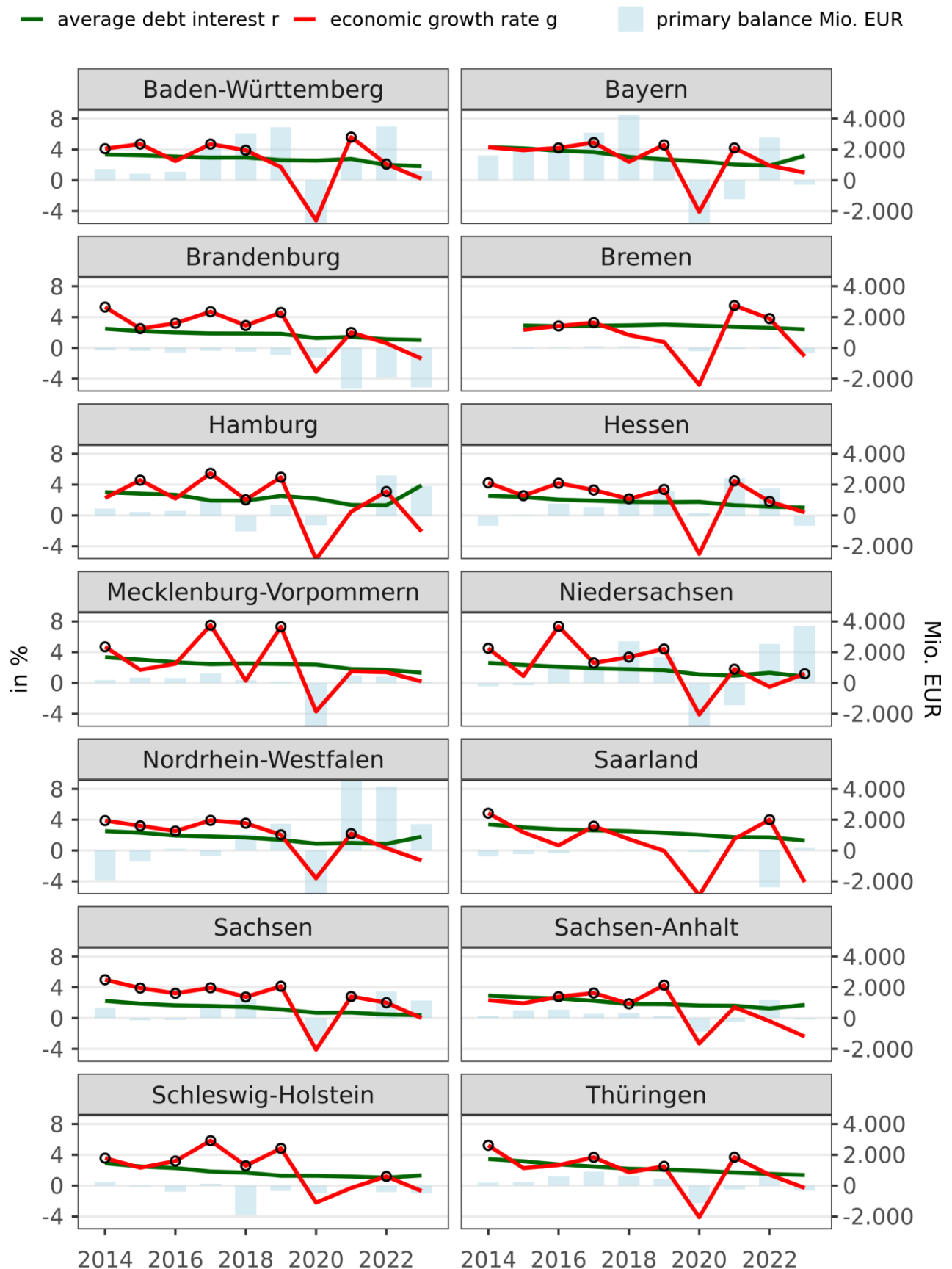


Figure 1. Economic growth, mean debt interest and primary balance over time in German Federal States (compiled by authors).

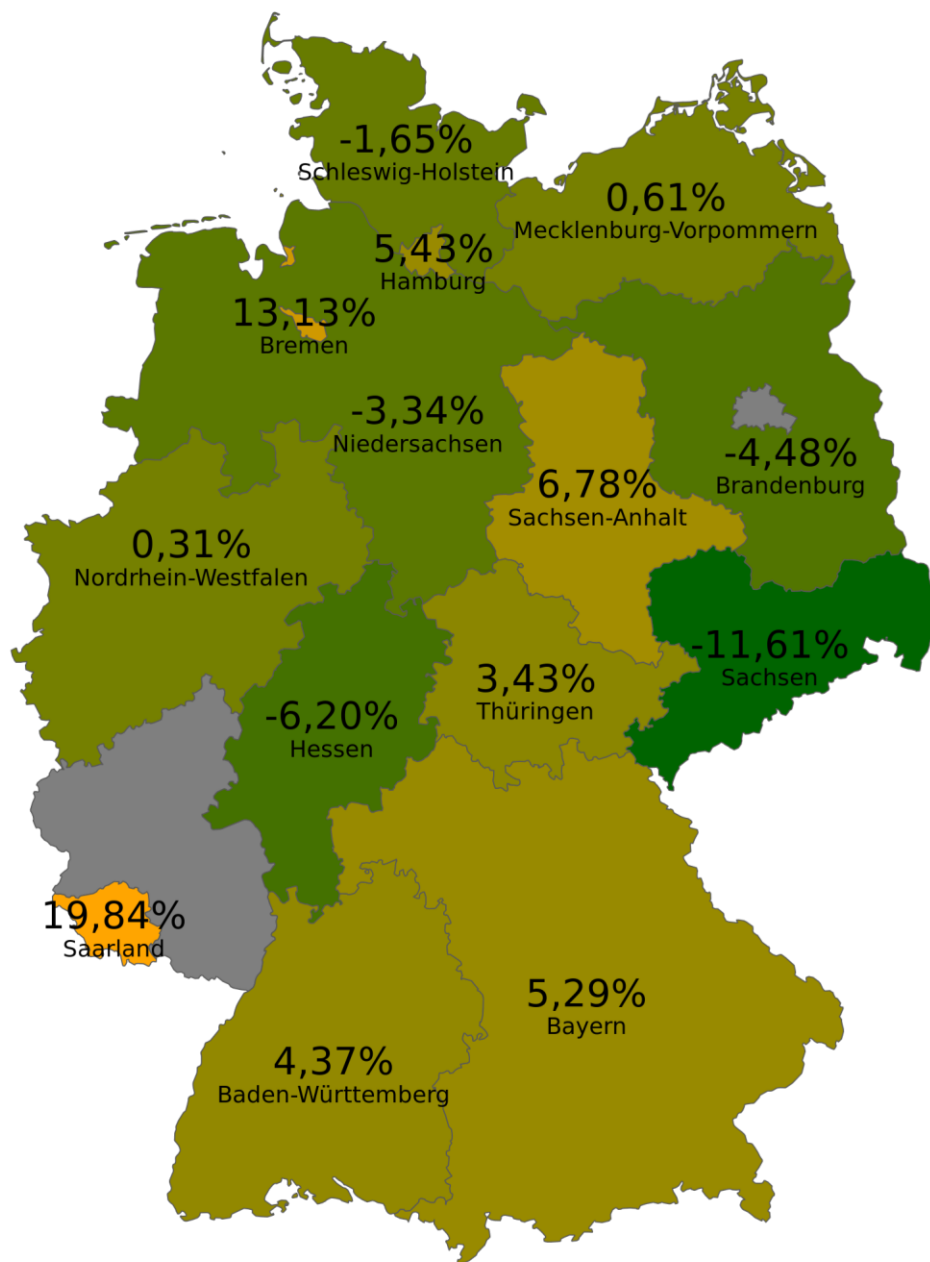


Figure 2. Cumulated R-G Differential of each German Federal State within the analysed time-period 2013 to 2023 (compiled by authors).

5. A new Fiscal Policy tool?

An evolving discussion on the R-G Differential might be essential for the interpretation and derivation of fiscal policy measures dedicated to design a state budget. The Domar-Model analysis showcases a direct influence on the change in the debt ratio between two years and determines a certain primary balance for a constant debt ratio in public households. However, since both r and g are exogenous, only the primary balance can be understood as a short-term fiscal policy instrument. In a desirable situation $r < g$, the debt ratio could be kept constant even in the case of a primary balance deficit. This means that additional expenditures, e.g. for economic and growth policy, would not necessarily conflict with higher debts, a governmental debt brake or sustainability of a public household. From a theoretical point of view, this finding opens greater fiscal policy opportunities and flexibility within the planning and implementation of a state budget. Again, on EU level $r > g$ is seen as axiom to define sustainable debt (S2) for public households.

Beyond its theoretical relevance, the R-G Differential can also serve as a practical fiscal monitoring instrument. When used systematically, it may provide policy-makers with early indications of whether fiscal paths are sustainable and / or whether debt-financed investments can be justified. As such, it offers an opportunity to embed more proactive and forward-looking planning principles into fiscal governance at the subnational level.

In this specific research, a focus was laid on the Domar-Model analysis of the R-G Differential on German Federal State level. As shown, empirically a favourable constellation $r < g$ emerges in most of the analysed years between 2013 and 2023. Hence, the conducted research

confirms a favourable R-G Differential constellation in accordance to existing observations made in research literature (Blanchard et al., 2023; Priewe, 2022). Notably, the present observation is the first empirical attempt addressing Federal State level fiscal performance.

This evidence highlights the practical utility of the R-G Differential as an empirical benchmark for classifying and comparing the fiscal health of different Federal States. It suggests that a more formalized integration of the indicator into regular fiscal reporting—particularly in medium-term budgetary frameworks—could strengthen financial planning and reinforce accountability. It also suggests that the R-G Differential could be used as a forward-looking indicator to identify states with fiscal space available for strategic investments without endangering fiscal sustainability.

As a result of conducted research, three groups were identified depending on their R-G Differential, whereas group one (I) had a favourable $r < g$ constellation constantly over time. As Figure 1 shows, within this group, only the state of Brandenburg has also a constant negative primary balance, fulfilling the assumptions made in the Domar-Model completely. Moreover, the state's debt ratio is decreasing over the analysed time period. Hence, even in this case higher expenditures could be capitalised on towards the equilibrium primary balance according to the model.

Federal States identified in group two (II) with alternating R-G Differentials the primary balance equilibrium obviously alternates accordingly. In those cases, each year has to be analysed individually to derive statements on the primary balance equilibrium.

This underscores the need for dynamic fiscal planning tools that can adjust or adapt to changes in economic growth and interest rate environments. Incorporating rolling R-G Differential projections into annual budget preparations could help policy-makers better anticipate fiscal pressures or windows of opportunity.

R-G Differential for the third group of Federal States (III) is positive, hence their primary balance equilibrium is positive as well. However, as Figure 1 shows for both concerned states the primary balance is negative, resulting into a non-sustainable fiscal policy. Recently, the German Stability Board identified an impending budgetary emergency in Saarland and approved the fiscal redevelopment program for Bremen. Consequently, conducted research methodology and its results is in line with actual fiscal monitoring of German Federal States.

In this context, the R-G Differential could evolve into a formalized early warning tool for the German Stability Board. States consistently showing a positive R-G Differential combined with negative primary balances could be flagged for enhanced fiscal oversight and consultation.

Despite additional area made for fiscal policy given by the identified R-G Differentials, the primary balances of the analysed German Federal States are not supporting the assumption of the Domar-Model with constant debt ratios. This statement is especially crucial, as current fiscal policy (on all levels) experiences growing pressure to seize opportunities for increasing necessary investments, e.g. transformation and resilience processes (Arestis, 2022). However, there might be a case that policy-making prefers other economic or political objectives, e.g. reducing the own debt ratio over time. As a consequential recommendation gained by this conducted research, a shift in political perspective by reducing debt ratio on Federal State level and moving towards seizing fiscal policy potentials given by the R-G Differential is strongly advocated, as the present research shows. At this point, it is necessary to mention German Stability Board as a joint institution of national government and Federal States, who is monitoring and ensuring compliance with fiscal stability. This centralised mechanism limits fiscal independences for the Federal States binding them to a coordinated key indicators including their debt ratio (Zipfel et al., 2011).

Nevertheless, integrating the R-G Differential as a decision-making tool could enrich the coordination process between the Federal Government and Federal States. It may support a more refined approach to assessing fiscal space beyond rigid debt thresholds, particularly in contexts where investment is critical for long-term economic potential.

However, currently, a practical integration of the R-G Differential and Domar-Model into fiscal policy does not appear to be realistic yet. One of the main reasons behind that is the ex-post time perspective of the R-G Differential. Both values r and g for a year t are only known in the year $t+1$, whereas policy-making does not have any influence on the primary balance for year t in $t+1$ (or at least very limited influence through supplementary budgeting). Hence, regulation opportunities on policy level using the R-G Differential are probably limited. An obvious solution would be to link the primary balance of year t to the constellation of r and g in year $t-1$. However, this procedure is not in line with the current German law highlighting the principle of annuality as well as the design of the debt brake (ref. to BVerfG, 2023).

Despite this, plausible reforms could aim to integrate forecast-based estimates of r and g into the ex-ante budget process, enabling the R-G Differential to function as a guiding metric under uncertainty. Statistical offices and economic research institutions already provide mid-year growth projections and interest rate forecasts that can be utilized to build a probabilistic fiscal framework.

Transforming the R-G Differential from an ex-post monitoring tool into an ex-ante planning instrument could enable its use in Federal State budgeting. Within the scope of this research, only publicly available data was used. But policy-makers of Federal States can rely their decisions on up-to-date data. The interest rate on debts can be regularly monitored and economic growth rates are measured at least on a half year basis supported by different economic projections published by several economic institutions. Considering this, designing the R-G Differential as an additional practical policy tool for household planning should be considered to identify and utilise additional spaces within fiscal policy.

Ultimately, institutionalizing the R-G Differential within medium-term financial planning, debt brake exception clauses, or fiscal performance dashboards could substantially increase fiscal responsiveness. It can serve as a bridge between sustainability and flexibility, enabling strategic investments while maintaining fiscal discipline. For these reasons, a broader and more structured use of the R-G Differential as a monitoring indicator and financial stability metric at Federal State level should be strongly considered.

6. Conclusion

In a sum, the conducted research analyses the R-G Differential for German Federal States between 2013 and 2023 to identify additional potentials for fiscal policy-making under the given circumstances of increasing challenges and growing requirements on more investments to be made by public households as well as binding structures through the debt brake.

The study examines the R-G Differential—the relationship between the mean debt interest rate (r) and nominal economic growth (g)—and its impact on fiscal policy in German Federal States. Historically, the assumption $r > g$ has shaped fiscal sustainability paradigms, but recent empirical findings indicates that $r < g$ is prevalent and holds significant implications for fiscal flexibility. This analysis employs the Domar-Model to evaluate public debt dynamics using data from 2013 to 2023, providing insights into state-level fiscal potentials under the constraints of Germany's debt brake and EU fiscal rules.

Key findings reveal that while most Federal States experiences a favourable R-G Differential ($r < g$) during the analysed period, this potential for increased fiscal flexibility has not been fully utilized. States with consistently negative R-G Differentials, such as Brandenburg and Hessen, theoretically possess room to expand expenditures with constant debt ratios.

The study also critiques the limitations of the ex-post nature of the R-G Differential, which constrains its integration as a proactive fiscal planning tool. Additionally, it argues for a shift in fiscal policy focus from strict debt reduction to leveraging the R-G Differential for strategic investments, particularly in addressing societal, infrastructural and environmental challenges.

The conducted study naturally faces several limitations. First, it focuses exclusively on explicit debts, excluding implicit liabilities such as pension obligations, which can influence fiscal sustainability assessments and potential additional space for fiscal policy. Second, the analysis relies on publicly available data, which varies in completeness, with some Federal States, such as Rheinland-Pfalz and Berlin, lacking critical information. This created gaps in the empirical findings.

Third, the calculation for the average debt rate follows a simplified method across all Federal States. Here, the calculated values might slightly differ from those being calculated within the states' government. Main reason is a different internal calculation method for the average debt rate and different booking systems. More precise, if applicable for a state, the actual handling and incorporation of existing derivatives within the portfolios and their influence on the average debt rate can't be specified with publicly available data.

The research also adopts an ex-post perspective, as the values for r and g are only calculable after the fiscal years ended. This limits its utility as a real-time policy tool, constraining proactive fiscal planning. Moreover, the R-G Differential allows to monitor a sustainable debt development.

Lastly, the study assumes static economic and political conditions, which may oversimplify the complex dynamics influencing fiscal policy at state and national levels. This includes the legal perspective of the interplay between R-G Differential as a policy tool and current regulations resulting from the Debt Brake.

Also, it is necessary to mention that the economic growth of all Federal States sums up to the growth of the country, hence, governmental as well as municipality debts need to be financed by this Federal States as well. Thus, the identified fiscal potential for the Federal States might be overstated in real terms.

Nevertheless, the R-G Differential within the Domar-Model could be an additional instrument for policy-making from a theoretical and conceptual perspective. The practical implementation or integration into the policy discourse remains unlikely at this stage. However, the research joins the on-going discussion on re-thinking policy-making and reforms (Schuster et al., 2021). Moreover, it offers an alternative perspective for the R-G Differential on Federal State level. Thus, future research should pick up this issue to continue the examination of Federal States' households and their unique circumstances between national and local public households. More precisely, future research could also address the problem of the principle of annuality of those Federal States setting up a biennial budget (the year t and $t+1$ would be set up in one public household processing). Those might be able to practically utilise on the opportunities of a favourable $r < g$ constellation for the primary balance.

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