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# KOF Working Papers

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# Fiscal Responses to Monetary Policy: Insights From a Survey Among Government Officials\*

Andreas Dibiasi<sup>†</sup>, Heiner Mikosch<sup>‡</sup>, Samad Sarferaz<sup>§</sup>, and Armin Steinbach<sup>¶</sup>

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This paper leverages a novel survey among German senior government officials to investigate fiscal responses to monetary policy shocks. Using randomized vignette treatments, we present officials with scenarios of increased government interest costs and analyze their expected fiscal adjustments. Our findings reveal that officials predominantly adjust fiscal policy by increasing debt and reducing spending, with tax increases being the least favored option. Moreover, they prefer adjusting multiple fiscal instruments simultaneously rather than changing a single instrument. In a back-of-the-envelope calculation, we compute the macroeconomic impact of a monetary policy shock under a mixed fiscal policy adjustment.

**JEL classifications:** D83, E62, E63, E52

**Keywords:** Fiscal policy, monetary policy, fiscal-monetary interaction, expectation formation, survey experiment

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# 1 Introduction

The effectiveness of monetary policy is often significantly influenced by its interaction with fiscal policy. In situations of fiscal dominance, debt monetization can lead to inflation and undermine the impact of monetary policy (Sargent and Wallace, 1981), and the Fiscal Theory of the Price Level (FTPL) posits that fiscal commitments of the government directly influence inflation, highlighting the role of fiscal policy in determining inflation (e.g., Leeper, 1991; Sims, 1994; Woodford, 1995; Cochrane, 1998). Recent research has broadened this focus, exploring the real effects of monetary-fiscal interactions and emphasizing how fiscal responses to unexpected interest rate changes can markedly alter the outcomes of monetary policy (e.g., Kaplan, Moll and Violante, 2018; Auclert, 2019).<sup>1</sup> Nonetheless, there is still limited empirical evidence on how fiscal authorities adjust their policies in response to monetary shocks.

The primary objective of this paper is to measure the fiscal policy response of government officials to a monetary policy shock, i.e. how the officials rebalance the public budget after an increase in the interest costs. To this end, we conduct a survey experiment with randomized vignette treatments among senior government officials from the Federal Ministries of Finance and Economic Affairs of Germany. We confront the government officials with a hypothetical scenario that comprises a monetary policy shock, i.e., an unexpected increase in interest costs that cause an imbalance in the government budget constraint. Subsequently, we ask the officials to correct the disbalance by adjusting one or more of the following fiscal instruments: public transfers, government spending, taxes, and public debt. To the best of our knowledge, we are the first ones to conduct a survey experiment among government officials and to provide empirical evidence on how the government adjust its fiscal budget in response to a monetary policy shock.<sup>2</sup>

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<sup>1</sup>Auclert, Rognlie and Straub (2020) argue that the effect of fiscal policy on monetary transmission can be negligible when considering long-term debt and excluding a balanced budget rule.

<sup>2</sup>In parallel to our work, Bouscasse and Hong (2023) conduct an observational study using time series data to provide estimates of fiscal reactions to monetary policy. In contrast, our study offers a causal analysis of the beliefs of fiscal agents who are part of the fiscal policy decision-making process, eliciting their “technical” reactions to interest rate changes and thereby providing direct estimates of fiscal

In our survey experiment, we first ask German government officials involved in fiscal policy decisions to state their expectations for GDP growth and inflation over various horizons. Next, the respondents are presented with a scenario in which the government plans a direct cash transfer to all residents. They then reassess their GDP growth and inflation expectations in light of the transfer program. Thereafter, officials are presented with a monetary shock scenario in which the European Central Bank (ECB) unexpectedly raises interest rates, leading to an increase in debt servicing costs. The officials are then asked to propose adjustments in public transfers, government spending, taxes, and/or public debt in order to rebalance the public budget constraint. In addition, officials reassess their expectations for GDP growth and inflation, taking into account both the monetary policy shock and their proposed budget adjustments. Both the size of the transfer program and the monetary policy shock are varied, with different groups randomly assigned to different scenarios.

Our empirical findings indicate that, on average, government officials adjust spending—transfers and government expenditures—and revenues—taxes and debt—in similar ways to rebalance the government’s budget. Both categories contribute about 50% to the overall budget adjustment. When assessing the single fiscal instruments, we observe that the government officials have a clear tendency to rebalance the public budget by increasing government debt (35% of the overall adjustment). The propensity to adjust taxes, on the other hand, is relatively low (17%). Transfers and government spending are situated in the middle, with propensities of 24% each. Our regression analysis indicates that the reported adjustments of transfers, taxes and debts are also statistically significantly different from zero, suggesting that the reported adjustments may have a non-negligible impact on fiscal policy outcomes. Furthermore, we find that the officials frequently adjust different fiscal instruments simultaneously: approximately 40% adjust three instruments simultaneously, 30% adjust two, and 10% adjust all four. Only 20% of

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instrument adjustments. Furthermore, our research can assess whether fiscal instruments are adjusted jointly or in isolation.

the government officials suggest to use only one fiscal instrument to rebalance the budget, a scenario commonly assumed in macroeconomic models.

We further use our identified propensities to adjust fiscal policy in order to estimate the economy's response to monetary policy. Specifically, we focus on the simultaneous adjustment of all fiscal instruments. We draw on the results of Kaplan, Moll and Violante (2018), who model responses to monetary shocks under various fiscal adjustments. Unlike their simulations, which isolate different fiscal instruments, we consider scenarios where all instruments adjust simultaneously. To do this, we employ a back-of-the-envelope calculation to compute weighted averages of the individual scenario estimates provided by Kaplan, Moll and Violante (2018), using our adjustment propensities as weights. We find that the combined effects contrast with those of individual fiscal scenarios, presenting a more moderate impact in the composite scenario. This middle ground results in less pronounced changes in output, investment, and consumption compared to the isolated adjustment scenarios.

Besides providing empirical evidence on how fiscal authorities react to monetary policy, this is the first paper to provide insights into the macroeconomic expectations of senior government officials. Their GDP growth and inflation forecasts are similar to those of forecasting experts in banks and research institutes in terms of cross-sectional distributions. The dispersion is much narrower than those of households or corporate managers. Remarkably, the government officials were on average closer to the actual GDP growth rate for 2024 than the forecasting experts from Consensus Economics. We also study how government officials update their expectations about future GDP growth and inflation when being confronted with a transfer shock and a monetary policy shock. In response to a transfer shock of €40 trillion (i.e., around 1% of GDP), government officials expect an increase in GDP growth of 0.4 percentage points (pp) in the following year, but the effect peters out in the second year already. Regarding inflation, the officials foresee somewhat longer effects, with an increase of 0.6 pp and 0.3 pp in the first and second year after

the transfer shock, respectively, and effects close to zero from year 3 onward. For the monetary policy shock, they expect somewhat smaller but longer-lasting effects on both GDP growth and inflation. We also study heterogeneity in the expectations of the government officials. In our survey experiment, we also ask the officials for an estimate of the marginal propensity to consume in the German population. We find that when their estimate of the MPC in the population is higher, the expected impact of the transfer shock on GDP growth is initially larger but fades out more quickly. In contrast, a lower MPC estimate leads to an initially weaker, but longer lasting response in GDP growth. Moreover, a higher MPC estimate significantly intensifies the impact of both the transfer and the interest rate shock on expected inflation.

We contribute to the Heterogeneous Agent New Keynesian (HANK) model literature that highlights the role of fiscal policy in the transmission of monetary policy shocks. Kaplan, Moll and Violante (2018) emphasize the significant impact of monetary policy on household consumption through labor demand effects, indicating the importance of fiscal responses in shaping macroeconomic outcomes. Auclert (2019) explores how monetary policy affects consumption through redistributive effects, highlighting the interaction with fiscal policy, debt management, and mortgage design. Eusepi and Preston (2018) argue that under imperfect knowledge, public debt's scale and structure critically influence monetary policy's control of inflation.<sup>3</sup> Our work provides novel empirical evidence on how government authorities adjust fiscal policy in response to monetary policy shocks. Moreover, we also offer new tentative evidence on the combined effects of different fiscal instruments on the monetary policy transmission to the economy, illustrating how these instruments interact to either amplify or mitigate the impact of monetary shocks.

More generally, we contribute to the rapidly growing macroeconomic survey experimental literature that incorporates randomized information or vignette treatments into household or firm surveys to study the expectation formation and decision-making of eco-

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<sup>3</sup>Further transmission channels of monetary policy in models that incorporate heterogeneous agents are studied by Werning (2015), McKay, Nakamura and Steinsson (2016), Sterk and Tenreyro (2018), Bilbiie (2019), Ravn and Sterk (2020), Gornemann, Kuester and Nakajima (2021) and Luetticke (2021).

conomic agents (e.g., Jappelli and Pistaferri, 2014; Drechsel et al., 2015; Armantier et al., 2016; Cavallo, Cruces and Perez-Truglia, 2017; Armona, Fuster and Zafar, 2018; Coibion, Gorodnichenko and Kumar, 2018; Christelis et al., 2019; Fuster et al., 2022; Coibion, Gorodnichenko and Weber, 2019; Coibion et al., 2019; Coibion, Gorodnichenko and Røpele, 2020; Jappelli and Pistaferri, 2020; Roth and Wohlfart, 2020; Christelis et al., 2021; Coibion et al., 2021; Fuster, Kaplan and Zafar, 2021; Andre et al., 2023; Link et al., 2023; Weber et al., 2023; Ash et al., 2024; Dräger, Lamla and Pfajfar, 2024; Dibiasi, Mikosch and Sarferaz, 2024; Baumann et al., 2024; Faia et al., 2024).<sup>4</sup> We extend this literature by including government officials in our study, thus extending the scope of survey experiments beyond households and firms.

The paper is organized as follows. Section 2 describes the survey and the survey sample of government officials. Section 3 presents the reaction of fiscal policy to the monetary policy shock. Section 4 discusses implications for the fiscal policy mix. Section 5 offers insights on the expectation formation of government officials, and Section 6 concludes.

## 2 Survey Among Government Officials

In this section, we first describe the sample of government officials and then present the survey questionnaire, including the hypothetical vignettes and the randomized treatment groups.

### 2.1 Survey Sample

We conduct a survey experiment among German government officials to study their expected fiscal responses to a monetary policy shock and to explore their assessment of the effects of a fiscal transfer shock. As participants in the survey experiment, we

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<sup>4</sup>See Fuster and Zafar (2023), Haaland, Roth and Wohlfart (2023) and Stantcheva (2023) for recent reviews.



specifically targeted senior ministry officials who are – actually or potentially – involved in fiscal policy-making.

**Targeted ministries.** Typically, fiscal policy decisions of the German government are prepared by the Ministry of Finance and the Ministry of Economic Affairs. While the primary competence for fiscal decisions in Germany lies with the Ministry of Finance, in order for their decision to be adopted by the government, the cooperation and approval by the Ministry of Economic Affairs is necessary. In the particular case of fiscal policy measures, both ministries generally work closely together in the preparation process, as both financial and economic policy aspects play a role.

**Targeted Directorate-Generals.** For our survey experiment, we target the Directorate-Generals of both ministries that are – actually or potentially – involved in fiscal policy decisions. Different Directorate-Generals may be involved in the decision-making in one way or the other. Within the Ministry of Finance, the Directorate-General for Fiscal Policy and Economics holds expert knowledge that is typically referred to when preparing decisions of fiscal nature. The corresponding department in the Ministry of Economic Affairs is the Economic Policy Directorate-General. If the fiscal decisions have a European dimension (which is often the case, especially when monetary policy aspects need to be considered), the Directorate-General for European Policy and International Fiscal Affairs in the Finance Ministry and the Directorate-General for European Policy in the Ministry of Economic Affairs can also be involved in the decision-making process. In addition, the Tax Directorate-General is usually involved in decisions on fiscal policy measures, especially when it comes to tax issues.<sup>5</sup> Clearly, not all Directorate-Generals and Directorates are involved in every single fiscal policy decision. However, each of the targeted divisions and individuals are potentially involved in fiscal policy decisions. With

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<sup>5</sup>Within the latter, the involved divisions are from Directorate A (“Strategic Management, Fundamental Topics and Coordination”) and, in case international aspects play a role, Directorate B (“International tax law; EU tax harmonisation; fundamental freedoms and EU fundamental rights”).

rotation of personnel being common practice in these ministries, each of these persons could eventually be assigned to work in the relevant divisions that contribute directly in the decision-making process.

**Target group.** Altogether, the targeted population for our survey comprises all senior ministry officials in the aforementioned five Directorate-Generals. Notably, the target group includes only senior officials performing substantive tasks (i.e., “Höherer Dienst” in German civil service categories). In contrast, personnel occupied with operational and supportive tasks (i.e., “Gehobener Dienst“ and “Mittlerer Dienst”) is not part of our target group. At the time the survey was conducted, the two ministries employed around 400 senior officials in the five Directorate-Generals (290 from the Finance Ministry and 110 from the Economics Ministry). We obtained the contact details of 393 of them.

## 2.2 Survey Questionnaire

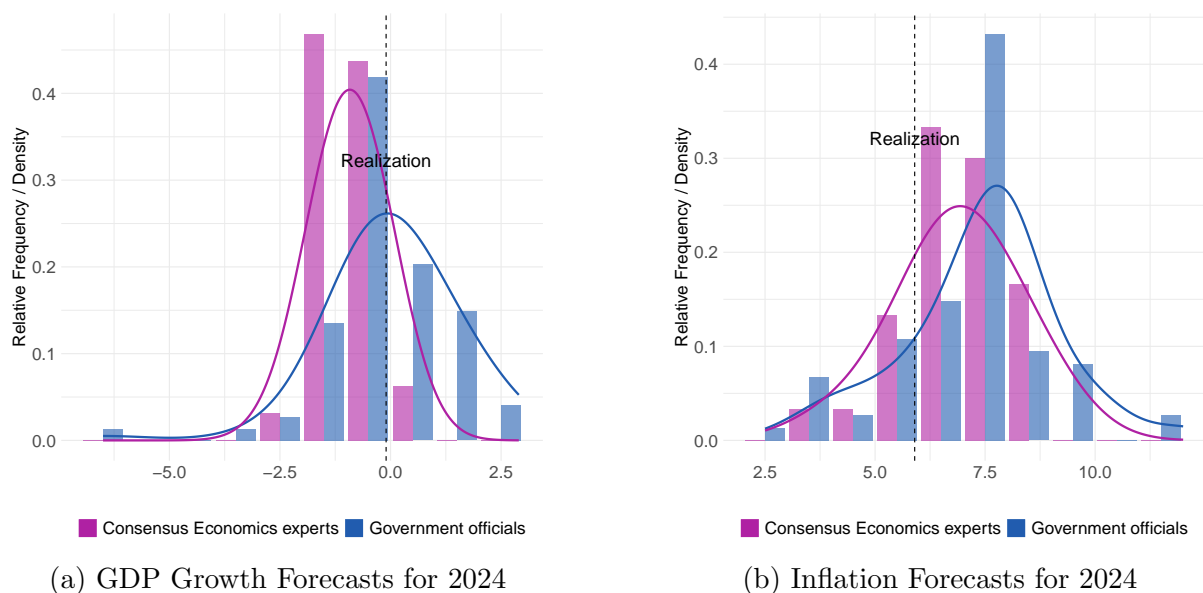
At the end of September 2022, we sent out e-mails to the above mentioned ministry officials, inviting them to participate in a survey via the purpose-designed web interface of KOF, ETH Zurich. The e-mail invitation was not explicit about the objective of the survey, it rather motivated the officials to support an empirical research project on the formation of expectations in the economic policy domain. The survey ended in December 2022. The questionnaire used neutral language and was provided in German, given that all ministry officials are German speaking. Out of the 393 contacted ministry officials, 74 participated in the survey, which corresponds to a response rate of 19%. Appendix Figures A.1 to A.3 present statistics on the response group and compare them with statistics on the target group, i.e., the entire group of contacted officials. Appendix Table A.1 shows summary statistics of the variables collected in the survey. The following paragraphs describe the survey step by step.<sup>6</sup>

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<sup>6</sup>Appendix Figure A.4 provides a graphical overview of the survey. Appendix D contains an English translation of the original questionnaire.

**Introductory text.** The survey started with a short welcome text. As for the e-mail invitation, the text motivated the survey participants to support an empirical research project on the formation of expectations in the economic policy domain, but did not mention the objective of the study. As an incentive to participate, we announced to donate €20 per participant to a charitable cause that each participant could choose freely at the end of the survey.

Figure 1: Forecasts of Government Officials and Consensus Economics Experts



Notes: The figure shows the frequency histograms of the GDP growth and inflation forecasts for the year 2024 of the surveyed government officials as well as the corresponding frequency histograms of the forecasts of the Consensus Economics experts as of November 2022. The kernel density distributions shown are smoothed versions of the frequency histograms. The dashed vertical lines represent the realized value of GDP growth and inflation, respectively

**GDP and inflation projections.** In the first two questions of the survey, we asked the ministry officials to provide their expectations for GDP growth and inflation in Germany for the years 2023, 2024, 2025, and 2030. Figure 1 compares the distributions of the government officials' GDP growth and inflation forecasts for 2024 with the corresponding forecasts by the Consensus Economics (CE) experts (Consensus Economics, 2022).<sup>7</sup> The

<sup>7</sup>CE collects monthly macroeconomic forecasts from experts in banks and economic research institutes. The CE projections are from the November 2023 wave and include 28 (24) individual forecasts for GDP growth (inflation). Our survey data include GDP and inflation forecasts of 74 government officials.

distributions of the government officials' forecasts are only slightly more widely spread than the CE distributions, despite the significantly higher number of underlying individual forecasts. In any case, the dispersion is much lower than for households or firm managers (e.g., Baumann et al., 2024). On average across all individual forecasts, the government officials were closer to the actual GDP growth rate for 2024 than the CE mean, but they were less accurate for inflation.

**Transfer program vignette.** We then confronted the officials with a hypothetical vignette of a public transfer program and asked for their assessment. The financial numbers in the vignette text differ according to the treatment group (more on this in Section 2.3). In the following reprint of the vignette, we have replaced the financial figures with placeholders X and Y, where  $X=40$  and  $Y=500$  for one treatment group and  $X=80$  and  $Y=1000$  for the other treatment group.

Consider the following scenario:

The German government considers launching a €X billion transfer program in 2023 with the following features: Every person in Germany receives a one-off payment of €Y at the beginning of 2023, to be spent immediately and free of charge. The program is to be announced in early January 2023 and implemented immediately. No information is currently available to the public.

The €X billion will be in addition to the previously planned budget. The transfer program is to be financed by an increase in new borrowing. Assume for the purpose of this study that the German debt brake and the European debt rules do not conflict with the program.

In order to estimate the economic impact of the transfer program, you are asked to give your assessment.

**Adjusted GDP and inflation projections.** After reminding the respondents of their previous GDP growth and inflation forecasts, we asked them to provide their expectations for GDP growth and inflation in Germany for the years 2023, 2024, 2025, and 2030, taking into account the transfer program.

**Assessment of marginal propensity to consume.** We then asked the respondents to estimate what percentage of the amount received from the transfer program the population consumes on average within the first year. We also asked them to estimate the proportion of hand-to-mouth consumers in the population (i.e., what proportion of the population consumes at least 80% or 100% of the transfer within the first year) and the proportion that saves the entire transfer.

**Interest rate hike vignette.** Next, we presented the ministry officials with another vignette. Again, the financial figure provided in the vignette text differs according to the treatment group (see Section 2.3). In the below reprint, the figure is replaced by a placeholder  $Z$ , where  $Z=10$  for one treatment group and  $Z=20$  for the other treatment group.

The German government's plans for the transfer program described above are currently known only to selected circles within the government. The European Central Bank (ECB) is not aware of them.

Irrespective of the German government's plans, the ECB has decided to raise interest rates more than expected in order to counter the current inflationary pressures. This rate hike implies an unexpected increase in the federal government's interest costs from 2023 onward of  $\text{€}Z$  billion per year on average over the next 3 years. Cumulatively over 3 years, the federal government's interest costs thus unexpectedly increases by  $\text{€}(3 \times Z)$  billion.

**Adjustment of the transfer program.** We then asked the ministry officials for their views on whether and, if so, how the government’s revenue and expenditure policies should be adjusted in light of the additional interest costs of €3×Z billion over the next three years (2023–2025). Specifically, the respondents were asked to allocate the amount of €3×Z billion to the following categories:

- Reduction of the planned transfer program: €
- Reduction of other government spending: €
- Increase in taxes: €
- Increase in new debt: €

**Re-adjusted GDP and inflation projections.** After reminding respondents of their previous GDP and inflation forecasts, we asked them once again about their expectations for GDP growth and inflation in Germany for the years 2023, 2024, 2025 and 2030, this time taking into account the transfer program, the interest rate hike and any adjusted government revenue/spending.

**Final questions.** Finally, we asked the respondents how independent they consider the ECB’s monetary policy to be from political influence (on a scale of 0% to 100%). We also asked the respondents about their age, gender, and educational (disciplinary) background, as well as their preferred purpose for the donation of €20.

## 2.3 Treatment Groups

We implement a randomized between-subject treatment design with active control groups (e.g., Mikosch et al., 2023). An advantage of the active control groups is that all groups

receive the same vignette information, except that the size of the transfer program or the change in the interest costs differ from group to group.<sup>8</sup>

**Transfer program treatment groups.** For the transfer program vignette, the ministry officials were randomly assigned to one of two treatment groups with a probability of 50%. The two groups differ only with regard to the figures given in the vignette on the volume of the transfer program. Specifically, one group was given a transfer program volume of  $\text{€}X$  billion =  $\text{€}40$  billion and a one-off payment per person of  $\text{€}Y = \text{€}500$  (“low transfer group”). The other group was given  $\text{€}X$  billion =  $\text{€}80$  billion and  $\text{€}Y = \text{€}1000$  (“high transfer group”).

**Interest rate hike treatment groups.** For the interest rate hike vignette, the respondents were again randomly (and independently of the previous assignment to the transfer program treatment groups) assigned to one of two treatment groups. The first group was given an increase in the government’s interest costs of  $\text{€}Z = \text{€}10$  billion per year or  $\text{€}30$  billion over the period 2023–2025 (“low interest cost group”). The second group was given  $\text{€}Z = \text{€}20$  billion per year or  $\text{€}60$  billion over 2023–2025 (“high interest cost group”).

**Balance checks.** To test for the exogeneity of the treatments, we separately regress the respondents’ pre-treatment projections on GDP and inflation and their individual characteristics (gender, education, and age) on a constant and an indicator variable that takes value one if the respondent is in the high transfer group and zero if they are in the low transfer group. Then, we iterate the regressions with an indicator variable that takes value one if the respondent is in the high interest cost group and zero if they are in the low interest cost group. If the coefficient estimates attached to the indicator variables are not significantly different from zero, this indicates that the random assignment of the

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<sup>8</sup>Stantcheva (2023) discusses the pros and cons of active versus passive control groups.

respondents to the treatment groups worked and the treatments are indeed exogenous. Appendix Figures A.5 and A.6 show the estimated coefficients for the transfer program vignette and the interest cost vignette, respectively. As one would expect, almost all of the coefficients are not significantly different from zero.

### 3 Government Officials' Response to a Monetary Shock

In this section, we explore how fiscal policy responds to a monetary policy shock. We first present how government officials adjust fiscal policy instruments in the event of an unexpected interest rate hike. Further, we examine the heterogeneity of adjustments across the officials and whether different fiscal adjustment instruments are used as substitutes or complements.

**Government budget constraint.** We assume that the government faces government expenditure  $G_t$ , administers different tax systems, where  $\tau_t$  summarizes the tax revenues, and has the possibility of making lump sum transfers  $T_t$  to households. The government can also issue debt  $B_t$ , on which it pays the amount of interest  $r_t^b B_{t-1}$ . The intertemporal budget constraint of the government is given by

$$r_t^b B_{t-1} + G_t + T_t = \tau_t + B_t - B_{t-1}. \quad (1)$$

In the survey, we presented the government officials with a vignette featuring an unexpected increase in the interest rate. Depending on the treatment arm, the survey respondents were presented with an increase in the yearly interest costs  $r_t^b B_{t-1}$  by either €10 or €20 billion. This increase creates an imbalance in the government's budget constraint. We asked the government officials to rebalance the budget constraint. They could do this by increasing tax revenues  $\tau_t$ , decreasing public transfers  $T_t$ , decreasing government spending  $G_t$  and/or letting public debt  $B_t$  increase. Notably, the respondents were free

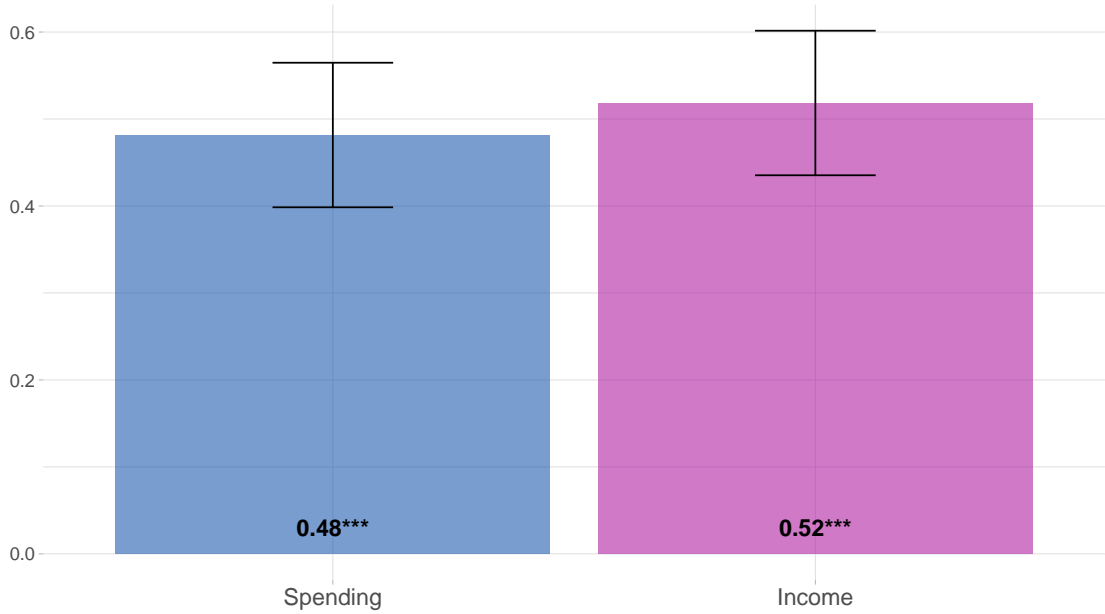


to decide whether they wanted to rebalance the budget constraint by adjusting just one, more than one or all of the four categories.

**Income vs. spending adjustment propensities.** We now assess how the government officials reacted to this unexpected change in monetary policy and the resulting imbalance. To begin with, we examine the aggregate response of the government officials to the unexpected interest rate hike, grouping the responses into two broad categories: To rebalance the budget constraint, government officials can either decrease spending (which includes transfers and government spending) or increase income (which includes taxes and debt). By normalizing the adjustments made by the ministry officials in response to the interest rate hike by the size of the additional interest costs, we gain insight into the fiscal adjustment propensities across these broader categories. Figure 2 shows these propensities for fiscal adjustment in response to the interest rate hike shock scenario. The figure reveals that the propensity to adjust within the two broad categories – spending and income – is relatively balanced, with spending adjustments marked by a propensity of 0.48 and income adjustments slightly higher at 0.52. This indicates an almost equal preference among government officials for decreasing spending and increasing income in response to the increased interest expenses resulting from the unexpected rise in interest rates.

**Disaggregate adjustment propensities.** Figure 3 offers a more disaggregated view, examining each component – transfers, government spending, taxes, and debt – individually. The figure exposes the nuances of the fiscal adjustments: The significant propensity to manage the increased interest costs through an increase in debt suggests that ministry officials prefer borrowing as a means of compensating for higher interest expenditures. Intermediate propensities are observed for transfers and government spending, suggesting a balanced but cautious approach to reducing these expenditures. Conversely, taxes show the lowest propensity for adjustment, indicating a reluctance to increase the tax

Figure 2: Propensity to Adjust to a Monetary Policy Shock

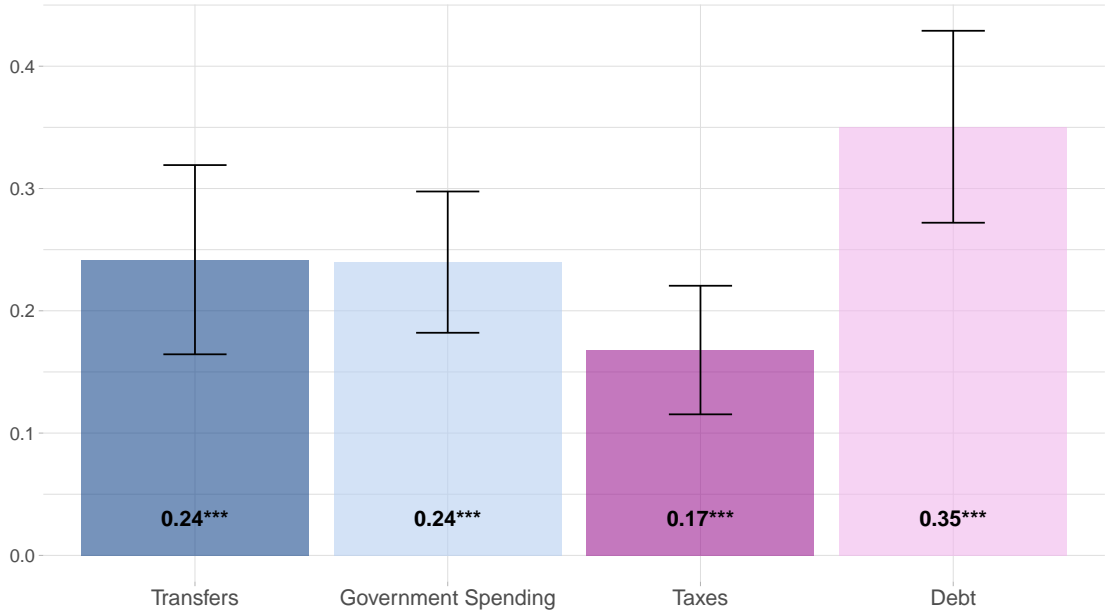


Notes: The figure shows government officials’ average propensity to reduce spending and/or increase income in response to the scenario of an unexpected increase in interest costs in order to rebalance the government’s budget constraint. Here, “spending” refers to the total of transfers and government expenditures, while “income” encompasses the sum of taxes and debt. We compute the propensity to reduce spending (increase income) for each respondent by dividing their individual spending reduction response (income increase response) by the size of the interest cost increase the respondent was confronted with in the survey. Expressed formally, the propensity of respondent  $i$  to reduce spending is equal to  $(\Delta G_{i,t} + \Delta T_{i,t})/\Delta r_{i,t}^b B_{t-1}$ , where  $\Delta r_{i,t}^b B_{t-1}$  is either €10 billion or €20 billion, depending on which treatment group the respondent belongs to. Accordingly, respondent  $i$ ’s propensity to increase income equals  $(\Delta \tau_{i,t} + \Delta B_{i,t})/\Delta r_{i,t}^b B_{t-1}$ . The average propensities are obtained by regressing the individual fiscal adjustment propensities on a constant. The error bars represent 90% confidence intervals. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

burden in response to rising interest rate expenditures. The normalization underlying the adjustment propensities in Figures 2 and 3 is based on the assumption that there is no non-linearity between the two treatment groups (additional interest costs of €10 billion or €20 billion). The regressions in Appendix Table B.3 test whether there is a non-linearity and find that this is not the case.

**Heterogeneity across respondents.** Further, our survey offers the possibility to examine the heterogeneity of fiscal responses across the government officials. Figure 4 shows

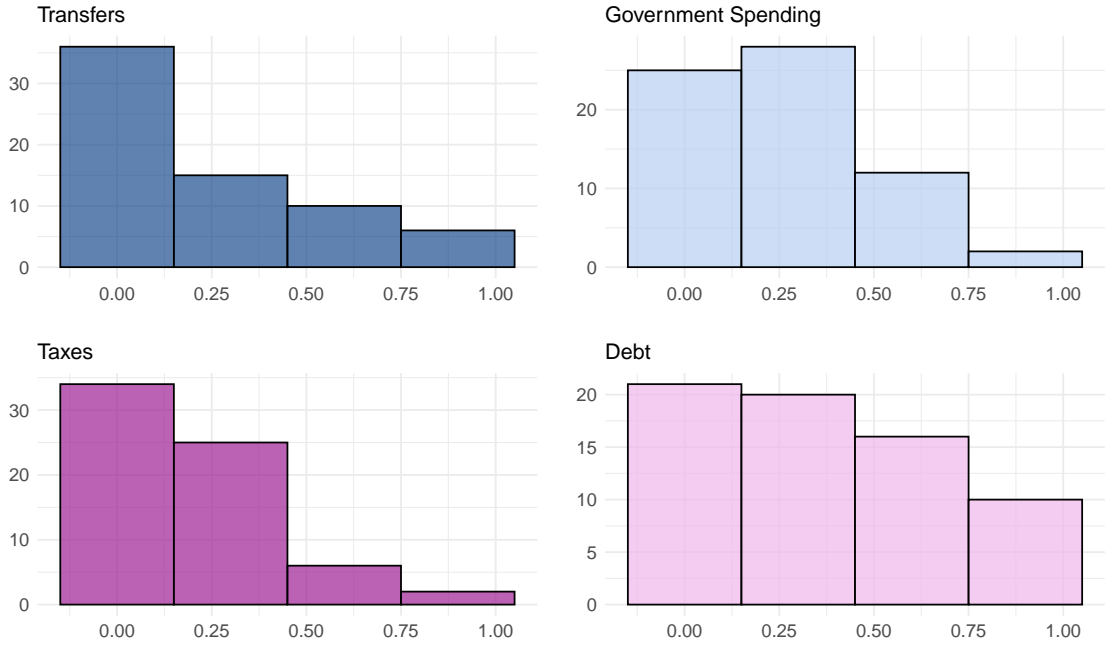
Figure 3: Adjustment Propensities for Different Categories



Notes: The figure shows government officials' average propensities to take certain fiscal instruments (reduction in government transfers, reduction in government spending, increase in taxes, and increase in public debts) in response to the scenario of an unexpected increase in interest costs. We compute the propensities for each respondent by dividing their individual responses by the size of the interest cost increase the respondent was confronted with in the survey. Expressed formally, the propensity of respondent  $i$  to reduce government transfers is equal to  $\Delta T_{i,t} / \Delta r_{i,t}^b B_{t-1}$ , where  $\Delta r_{i,t}^b B_{t-1}$  is either €10 billion or €20 billion, depending on which treatment group the respondent belongs to. Respondent  $i$ 's propensities to reduce spending, increase taxes and increase debts are calculated accordingly. The average propensities are obtained by regressing the individual fiscal adjustment propensities on a constant. The error bars represent 90% confidence intervals. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

the distributions of the individual adjustment propensities for the different fiscal instruments. The distributions of transfers and taxes show a concentration of the probability mass around zero, indicating that most government officials prefer minimal adjustment or no use of these fiscal instruments. For government spending, we observe a relatively more evenly distributed probability mass at moderate adjustments, suggesting a tendency towards more substantial but not drastic changes. In contrast, the distribution of debt exhibits a higher probability mass above 0.5, in comparison to the other categories. This is consistent with the observed preference for using borrowing to cope with higher interest costs.

Figure 4: Fiscal Adjustment Heterogeneity



Notes: The figure depicts the distributions across the individual government officials' propensities to reduce transfers, lower government spending, increase taxes and/or let public debts increase in response to an unexpected increase in interest costs.

**Active control group approach.** Another way of analyzing the government officials' fiscal adjustments in response to the monetary policy shock is to exploit the active control group design of our survey.<sup>9</sup> Specifically, we implement the following regression model:

$$\Delta z_i = \beta_0 + \mathbf{x}_i \boldsymbol{\beta} + d_i \gamma + \epsilon_i, \quad (2)$$

where  $\Delta z_i$  is either the government spending reduction  $\Delta G_i$ , the tax revenue increase  $\Delta \tau_i$ , the public transfer decrease  $\Delta T_i$ , or the public debt  $\Delta B_i$  indicated by respondent  $i$  in order to rebalance the public budget in response to the interest rate shock,  $\mathbf{x}_i$  is a vector of control variables, and  $d_i$  is a dummy variable taking value one if the respondent is in the group with the interest cost increase of €60 billion and zero if they are in the group facing an interest cost increase of €30 billion. The latter group serves as an active control group. The coefficient  $\gamma$  captures the difference in the adjustments to government

<sup>9</sup>See Haaland, Roth and Wohlfart (2023) for a discussion of the advantages of active control groups.

Table 1: Fiscal Adjustment (Active Control Group Setup)

	Transfer Decrease	Spending Decrease	Tax Increase	Debt Increase
Interest cost increase: high	10.40** (4.32)	2.98 (2.82)	4.64* (2.73)	11.99*** (4.21)
Observations	67	67	67	67

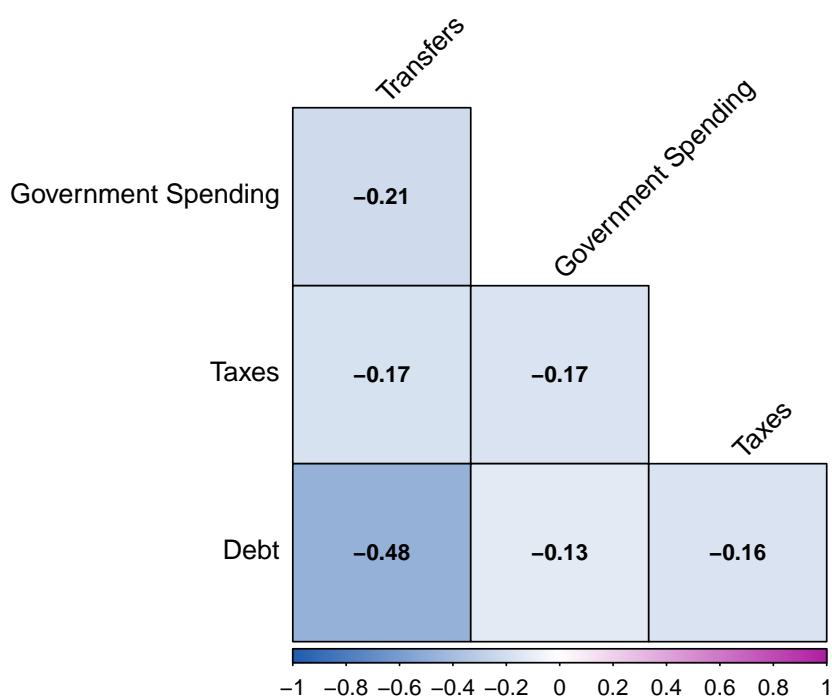
Notes: The table reports the estimates of four individual-level regressions according to Equation (2), with the dependent variables being the budget adjustment in public transfers, government spending, taxes or public debt, respectively, made by the government officials in response to an unexpected increase in the interest costs. The regressions include a constant term, various control variables (not shown here; see Table B.4), and a dummy variable which is set to one for respondents who have been randomized to the high interest cost treatment arm (i.e., cost increase of €60 billion) and zero for those in the low interest cost treatment arm (i.e., cost increase of €30 billion). Standard errors are in parentheses. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

spending between the two treatment groups. We estimate the regressions with ordinary least squares (OLS). As shown in Table 1, public transfers are reduced by an additional amount of €10.4 billion in response to the cost increase of €60 billion cost as compared to the cost increase of €30 billion. Government spending is reduced by €3.0 billion and taxes are increased by €4.6 billion. The remaining €12.0 billion are balanced by higher debts. Overall, these results confirm the previous findings on the propensities to adjust: the increase in the interest costs is to some part financed by an increase in public debt and to another part by lower (transfer) spending, while tax increases play only a minor role for the rebalancing of the public budget. For the purpose of transparency, Appendix Table B.4 repeats Table 1 showing the coefficient estimates of all control variables in the regression. In addition, Table B.4 iterates the regression in Equation (2) excluding all control variables. The results change only slightly.

**Correlation of adjustment instruments.** Observing the use of fiscal instruments on an individual level allows us to also examine the correlation between adjustments in the variables transfers, government spending, taxes, and debt. We find that fiscal instruments are not used in isolation. Figure 5 reveals that debt and transfers are the most strongly

interconnected. Specifically, an increase in debt is associated with a lesser reduction in transfers (correlation coefficient of  $-0.48$ ), indicating a substitution effect between spending and income categories. We also observe a notable substitution effect within the spending categories, where a stronger reduction of government spending is accompanied by a lesser reduction in transfers (correlation coefficient of  $-0.21$ ). Additionally, an increase in taxes is negatively correlated with a decrease in transfers, spending as well as debt, highlighting again the substitution between the different fiscal instruments.

Figure 5: Correlations in Fiscal Components



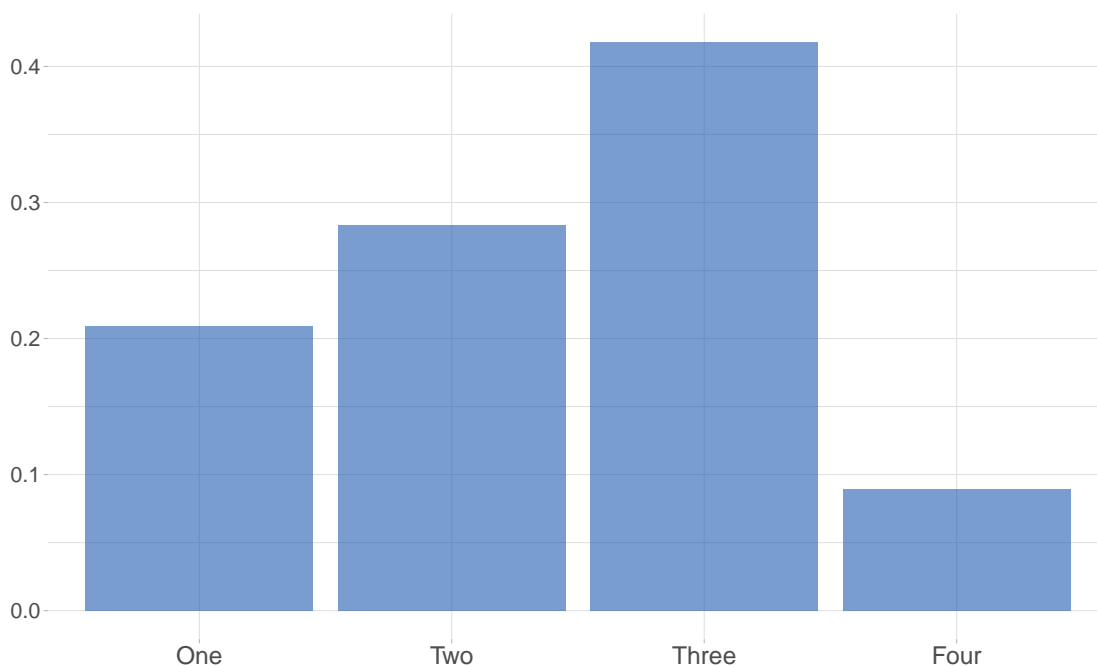
Notes: The figure shows the Pearson correlation across respondents between the different fiscal adjustment variables (reduction in public transfers, reduction in government spending, increase in taxes, increase in public debt) to a monetary policy shock.

## 4 Combining Fiscal Instruments

In this section, we study how the officials combine the different fiscal instruments and their joint effect on the economy.

**Simultaneity of fiscal adjustments.** Figure 6 depicts the number of different fiscal instrument used simultaneously in response to the unexpected change in the interest costs. Slightly more than 20% of the government officials propose the use of only one fiscal instrument. 28% use two instruments and 42% rely on the combination of three different instruments. 9% even made use of all four fiscal instrument at their disposal. This shows that the majority of government officials combine different fiscal instruments in order to rebalance the budget constraint. Appendix C provides an in-depth analysis of the probabilities associated with various combinations of fiscal instruments. It examines the likelihood of different fiscal policies being implemented together, as well as the probabilities of specific instruments being utilized in isolation.

Figure 6: Simultaneity of Fiscal Instruments



Notes: The figure depicts the frequency of simultaneous adjustments of public transfers, government spending, taxes, and public debt.

**Effects of monetary policy shock under different fiscal adjustment scenarios.**

Through a back-of-the-envelope analysis, we aim to uncover preliminary insights into the interplay of the different fiscal instruments, providing a foundation for understanding

their combined effects on the economy. Concretely, we analyze the economic effects of the concurrent fiscal actions by drawing on insights from Kaplan, Moll and Violante (2018). Their HANK model captures both the direct effects of interest rate changes on consumption and the substantial indirect effects arising from adjustments in household income and fiscal measures, all within a coherent general equilibrium framework. Columns (1) to (4) of Table 2 summarizes the findings of Kaplan, Moll and Violante (2018) on the economy’s response to a monetary policy shock.<sup>10</sup> The table depicts four distinct scenarios of fiscal response to balance the government’s budget following an expansionary monetary shock: adjustments in either public transfers, government spending, labor income taxes, or public debt. Each scenario reveals different magnitudes of impact on key economic variables, including the change in interest rates  $r_b$  and the elasticities of output  $Y$ , investment  $I$ , and consumption  $C$  to the change in the interest rate. It is important to note that each of the four fiscal scenarios is assumed to unfold in isolation.

Table 2: Responses to a Monetary Shock Under Different Fiscal Adjustments

	(1)	(2)	(3)	(4)	(5)
	Transfers	Spending	Taxes	Debt	Policy Mix
Change in $r_b$	-0.28	-0.23	-0.33	-0.34	-0.30
Elasticity of $Y$	-3.96	-7.74	-3.55	-2.17	-4.30
Elasticity of $I$	-9.43	-14.44	-8.80	-5.07	-9.20
Elasticity of $C$	-2.93	-2.80	-2.75	-1.68	-2.45

Notes: The table shows in Columns (1)-(4) the responses of different macroeconomic variables to an expansionary monetary shock over the first year after the shock, under either adjustments in transfers, government spending, labor income taxes, or government debt. The considered macroeconomic response variables are the real return on liquid assets ( $r_b$ ) and the elasticities of output ( $Y$ ), investment ( $I$ ), and consumption ( $C$ ) to the change in  $r_b$ . All numbers in Columns (1)-(4) are taken from from Table 8 in Kaplan, Moll and Violante (2018). Column (5) shows our estimates of the responses under a mixed fiscal adjustment scenario.

A crucial insight emerges from this table: the type of fiscal adjustment significantly influences the effectiveness of monetary policy. For instance, when government expenditures are increased, the impact on the economy is more pronounced due to a direct boost in aggregate demand, which contrasts with scenarios where transfers adjust or taxes are

<sup>10</sup>The values are taken from Table 8 in Kaplan, Moll and Violante (2018).



modified. Conversely, allowing government debt to increase as a means to absorb fiscal imbalances might result in a lesser immediate economic impact. This highlights the importance of the fiscal response mechanism in amplifying or dampening the effects of monetary policy shocks.

**Effects of monetary policy shock under policy mix scenario.** The aim of our analysis is to identify the economic effects of the interest rate shock when the different fiscal instrument are used in combination (“policy mix”). In order to achieve this, we draw on the propensities to adjust, as detailed in Section 3. This allows us to assign weights to combine the distinct responses of output, investment, and consumption under the four scenarios. Specifically, for the transfer scenario, we assign a weight of 0.24; for the scenario where only government spending adjusts, we also assign 0.24; for the tax adjustment scenario, 0.17; and for the debt adjustment scenario, 0.35. As shown in Column 5 of Table 2, the effects in the policy mix scenario are weighted averages of the effects in the individual scenarios. The policy mix scenario thus represents a middle ground between scenarios with rather strong effects, such as the spending scenario with an output elasticity of  $-7.74$  and an investment elasticity of  $-14.44$ , and scenarios with rather weak effects, such as the debt scenario with an output elasticity of  $-2.14$  and an investment elasticity of  $-5.07$ . The analysis underscores the strategic advantage of a mixed fiscal response to monetary shocks. By interweaving different fiscal adjustments, the government can mitigate the extremes of a single policy change.

## 5 Adjustments in Macroeconomic Expectations

Government officials play a central role in the design and implementation of fiscal policy, making their expectations a focal point of interest. Our study provides the possibility to observe expectations of government officials on key macroeconomic variables and to gain insights into their formation process and heterogeneity. In this section, we examine how

government officials adjust their expectations for GDP growth and inflation in the face of the shock scenarios described in Section 2.2.

**Expected shock effects.** Consider the following change in expectations of government official  $i \in \{1, \dots, n\}$ :

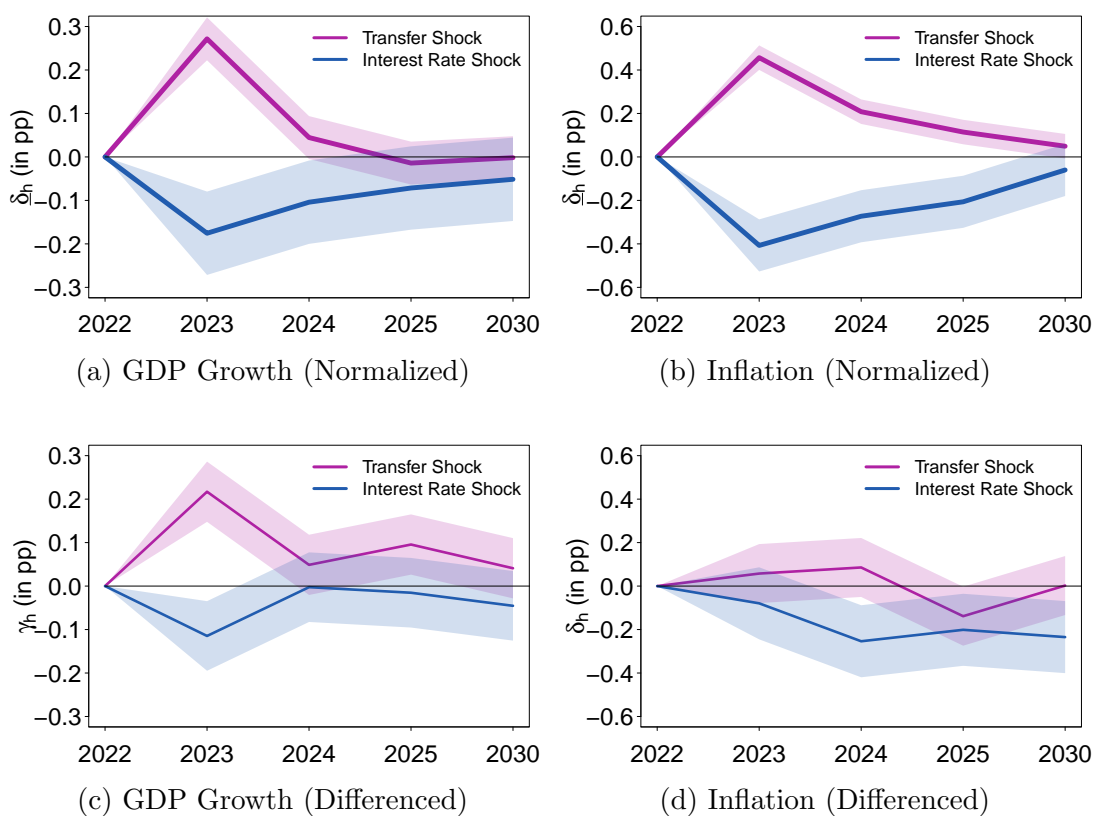
$$\delta_{i,h} = E_{i,t}[y_{i,t+h}|\eta_t = 1] - E_{i,t}[y_{i,t+h}|\eta_t = 0], \quad (3)$$

where  $E_{i,t}[y_{i,t+h}]$  is  $i$ 's expectation in year  $t$  about a macroeconomic outcome in year  $t+h$  and  $\eta_t$  is a treatment variable with  $\eta_t = 0$  before  $i$  is presented with the shock vignette and with  $\eta_t = 1$  after presentation of the vignette. Thus,  $\delta_{i,h}$  is government officials  $i$ 's expected change in a macroeconomic outcome in response to a shock scenario  $h$  years after the shock. In our survey,  $y_{i,t+h}$  is either the GDP growth rate (in %) or the inflation (in %), the shock scenario is either the transfer shock vignette or the interest rate shock vignette, and  $h = 1, 2, 3, 8$ .

**Normalized responses.** Assuming that  $\delta_{i,h}$  is linear in the size of the shock presented in the scenario, we can normalize the effects. Specifically, for the transfer shock scenario,  $\underline{\delta}_{i,h} = \delta_{i,h}/2$  if respondent  $i$  is in the treatment group with the transfer of €1000 and  $\underline{\delta}_{i,h} = \delta_{i,h}$  if they are in the €500 group. Similarly, for the interest rate shock scenario,  $\underline{\delta}_{i,h} = \delta_{i,h}/2$  if  $i$  is in the €60 billion group and  $\underline{\delta}_{i,h} = \delta_{i,h}$  if they are in the €30 billion group. The upper panels of Figure 7 show the normalized expected effects for GDP growth and inflation in response to the transfer and the interest rate shock scenario, averaged over all respondents (i.e.,  $\underline{\delta}_h = \frac{1}{n} \sum_{i=1}^n \underline{\delta}_{i,h}$ ). The purple lines display the effects of the transfer shock. As can be seen from the upper-left graph, the transfer increases expected GDP growth by approximately 0.25 pp in 2023. No significant difference is observed for the years 2024, 2025, and 2030. The upper-right graph shows that the transfer is also expected to increase inflation. In 2023, the inflation rate is higher by

around 0.45 pp, in 2024 by 0.2 pp and in 2025 by 0.1 pp. The blue lines depict the expected response of the economy to the interest rate shock, defined as the difference between the expectations in the face of the interest rate and the transfer shock scenario minus the expectations pertaining to the transfer shock scenario alone. The interest rate hike by the ECB is expected to decrease GDP growth by approximately 0.15 pp in 2023 and 0.10 pp in 2024. There are no statistically significant indications that the effects persist beyond 2025. Further, the government officials expect that the interest rate will decrease inflation, by 0.4 pp in 2023, 0.3 pp in 2024, and 0.2 pp in 2025.

Figure 7: Change in Expectations in Response to Shock



Notes: The upper panels of the figure show the percentage point change in GDP growth forecasts (left panel) and inflation forecasts (right panel) for the years 2023, 2024, 2025, and 2030 in response to the transfer and the interest rate shock scenario, respectively, averaged across all government officials. The lower panels of the figure show the  $\gamma$ -coefficient estimates for the different horizons resulting from Equation (4) and displayed in Appendix Table B.2. The  $\gamma$ -coefficients can be interpreted as a robust way to elicit the expectation changes in response to the shock scenarios. The shaded areas represent one standard deviation confidence bands.

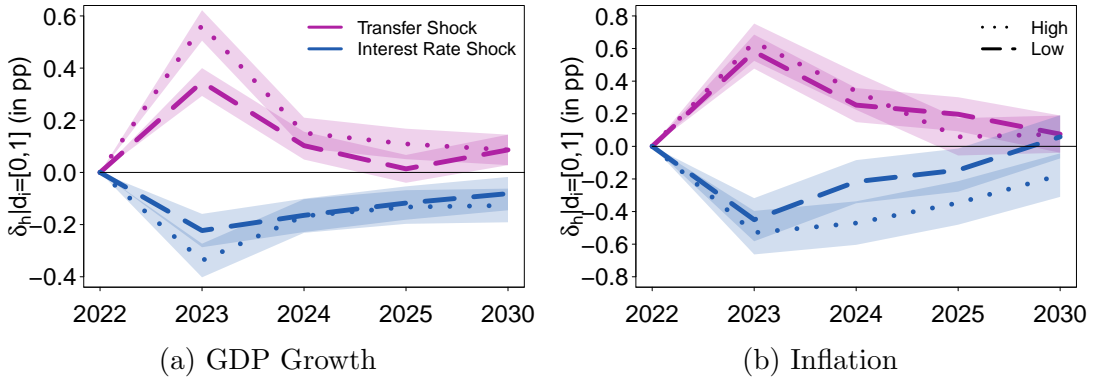
**Active control group approach.** As an alternative evaluation strategy, which is robust to priming effects, consider the following regression model:

$$\delta_{i,h} = \mathbf{x}_i\boldsymbol{\beta} + \boldsymbol{\tau}_i'\boldsymbol{\alpha} + \boldsymbol{\tau}_i'd_i\boldsymbol{\gamma} + \epsilon_i, \quad (4)$$

where  $\boldsymbol{\tau}_i$  is a vector of four horizon dummies with the first (second, third, fourth) dummy taking value one for horizon  $h$  and zero otherwise and  $d_i$  is, as in Equation (2), a dummy variable with value one if the respondent is in the high transfer group (high interest cost group) and zero if they are in the low transfer group (low interest cost group). In this active control group setup, the  $\boldsymbol{\gamma}$ -coefficients represent the differential expected effects between the two treatment groups. Importantly, these  $\boldsymbol{\gamma}$ -coefficients remain unbiased by potential priming or experimenter demand effects, provided these influences are consistent across both treatment groups (Haaland, Roth and Wohlfart, 2023). The regression results are displayed in Appendix Table B.2. In order to facilitate a comparison with the normalized effects, the lower two panels of Figure 7 present the estimated  $\boldsymbol{\gamma}$ -parameters for the various horizons. For GDP, the effects resulting from the differentiation strategy are comparable to the normalized effects, with the transfer (interest) shock scenario causing the expected GDP growth for 2023 to increase (decrease) and no significant effects being anticipated from the second year following the shock. In contrast, for inflation the effects of the differentiation strategy differ significantly from the normalized effects. We conclude that the effects of the shock scenarios on GDP expectations, as previously determined, are robust; however, this robustness does not extend to inflation.

**High vs. low shock.** Our survey experiment permits us to also explore the heterogeneity of the expectations of the government officials. First, we study the expected macroeconomic effects for different shock sizes. Specifically, we use the regression estimates of Equation (4) and predict  $\delta_{i,h}$  for all horizons  $h$  conditional on  $d_i$  being either one (i.e., high shock size) or zero (i.e., low shock size), with the values of the control variables

Figure 8: Change in Expectations in Response to Shock – High vs. Low Shock



Notes: The figures show, based on the coefficient estimates of Equation (4), the predicted effects  $\delta_{i,h}$  of the shock scenarios on the government officials' expectations for GDP growth (left-hand panel) and inflation (right-hand panel) conditional on the shock size dummy  $d_i$  being either one (i.e., high shock size) or zero (i.e., low shock size). The coefficient estimates are displayed in Appendix Table B.2. The shaded areas represent one standard deviation confidence bands.

in  $x_i$  being set to their respective sample means.<sup>11</sup> Figure 8 plots these conditional effects of the shock scenarios on the government officials' GDP growth and inflation expectations. We find that government officials expect higher shocks to have a larger impact on the economy. The high shocks (dotted line) lead to higher expected effects on GDP growth and inflation than the low shocks (dashed lines). This difference is particularly evident for the GDP reaction following the transfer shock. On average, government officials expect the GDP reaction on impact to be twice as large for the high transfer shock as for the more moderate transfer shock.

**High vs. low MPC.** As an additional way to study the heterogeneity in expectations, we investigate whether government officials' assessment of the macroeconomic impact of the shock scenarios is influenced by their beliefs about the MPC in the population. To

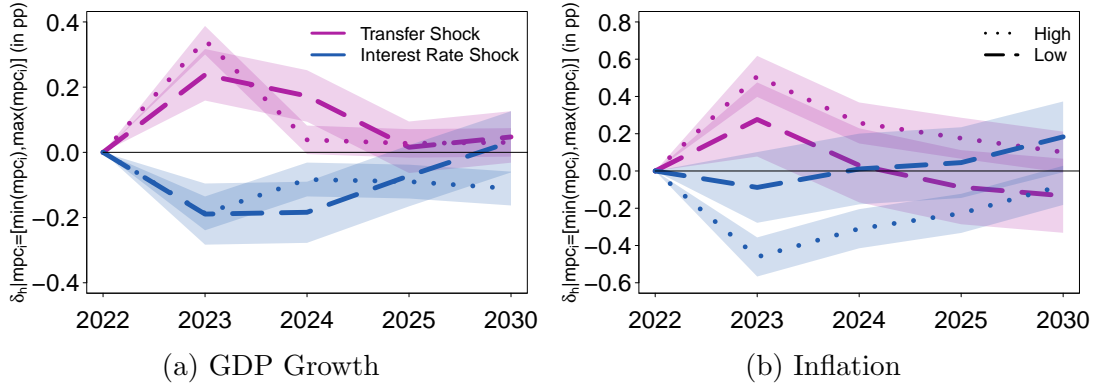
<sup>11</sup>As described in Section 2.3, in the case of the government transfer, the high shock size corresponds to a transfer of €80 billion and the low shock size to a transfer of €40 billion. For the monetary policy shock, the high shock size corresponds to an interest rate increase that leads to additional interest costs in the amount of €60 billion and the low shock size corresponds to additional costs of €30 billion.

this end, we run the following regression:

$$\delta_{i,h} = \mathbf{x}_i\boldsymbol{\beta} + \boldsymbol{\tau}_i'\boldsymbol{\alpha} + \boldsymbol{\tau}_i'\text{mpc}_i\boldsymbol{\theta} + \epsilon_i, \quad (5)$$

where  $\text{mpc}_i$  is government official  $i$ 's belief of what percentage of the received transfer the population will consume within the first year after the transfer (see Section 2.2). The regression estimates are recorded in Appendix Table 5. In order to visualize the influence of the MPC beliefs, we use the regression estimates to predict  $\delta_{i,h}$  conditional on different values for  $\text{mpc}_i$ , with the values of the control variables in  $x_i$  being set to their respective sample means. Figure 9 compares the expected response of GDP and inflation to the transfer and interest rate shock, conditional on the government officials' beliefs about the MPC. The dotted (dashed) lines show the predicted response for an MPC of 100 (10), i.e., 100% (10%) of the transfer received is consumed within the first year. Two things can be observed. First, when the believed MPC is high, the impact of the transfer shock on GDP growth is initially larger but fades out more quickly. Conversely, when the MPC is low, the initial response of GDP growth is weaker, but the effect lasts longer. Second, when the MPC is high, the impact of the transfer and interest rate shocks on inflation is stronger.

Figure 9: Change in Expectations in Response to Shock – High vs. Low MPC



Notes: The figures show, based on the coefficient estimates of Equation (5), the predicted effects  $\delta_{i,h}$  of the shock scenarios on the government officials' expectations for GDP growth (left-hand panel) and inflation (right-hand panel) conditional on the government officials believing that the MPC in the population is either high (i.e., 100%) or low (i.e., 10%). The coefficient estimates are displayed in Appendix Table B.1. The shaded areas show one standard deviation confidence bands.

## 6 Conclusion

This paper investigates the fiscal responses to monetary policy shocks through a survey experiment conducted with officials from the German Ministry of Finance and the German Ministry of Economic Affairs. By examining these officials' propensities to adjust transfers, government spending, taxes, and debt in response to an unexpected interest rate increase, we provide new empirical insights into the interaction between fiscal and monetary policies.

Our study contributes to the HANK literature by providing empirical evidence on the propensities to use the various fiscal instruments in response to monetary shocks. Additionally, we contribute to the macroeconomic survey experimental literature studying expectation formation by incorporating government officials into the study, expanding the scope beyond households and firms.

Our findings reveal that officials adopt a balanced approach, adjusting both spending and income-side fiscal instruments, with a marked reluctance to modify taxes and a higher propensity to adjust debt levels. This balanced strategy contrasts with the often

isolated fiscal adjustments assumed in traditional macroeconomic models. Furthermore, our regression analysis indicates that changes in government spending are not statistically significant, suggesting a limited impact on overall fiscal policy outcomes.

Using our identified fiscal propensities, we simulate the economy's response to monetary policy shocks under simultaneous fiscal adjustments. Our analysis demonstrates that combined fiscal adjustments have a more moderate impact on economic variables compared to isolated adjustments.

Future research could build a model that incorporates a mixture of fiscal adjustments directly into the objective function of fiscal policy. This would enable the development of models that deliver consistent responses of the economy and fiscal policy to monetary policy shocks, providing a more comprehensive understanding of the dynamic interplay between these policies.



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Fiscal Responses to Monetary Policy:  
Insights From a Survey Among Government Officials  
– Online Appendix –

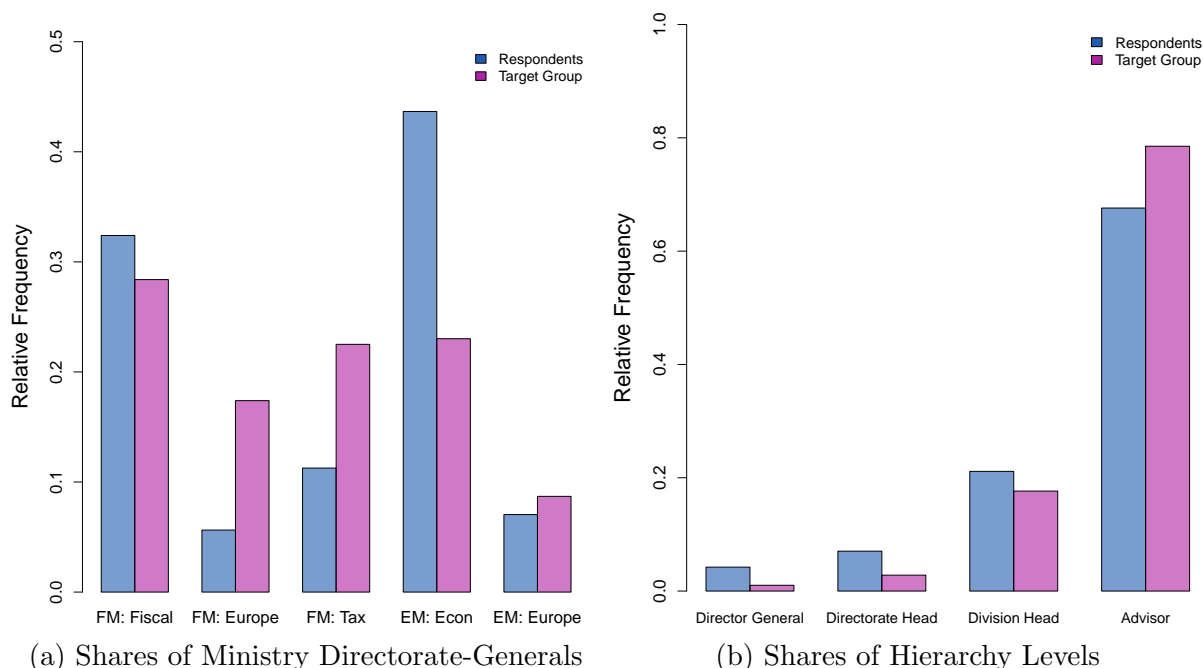
Andreas Dibiasi, Heiner Mikosch, Samad Sarferaz, and Armin Steinbach

August 24, 2024

This appendix provides supplementary material. Section A presents additional information on the survey, including statistics on the surveyed group of government officials, summary statistics of the collected variables, a graphical overview of the survey, and treatment group balance checks. Section B includes additional regressions results. Section C provides evidence on the government officials' probabilities of fiscal adjustment in response to the monetary policy shock scenario. Section D shows the survey questionnaire.

# A Additional Material on the Survey

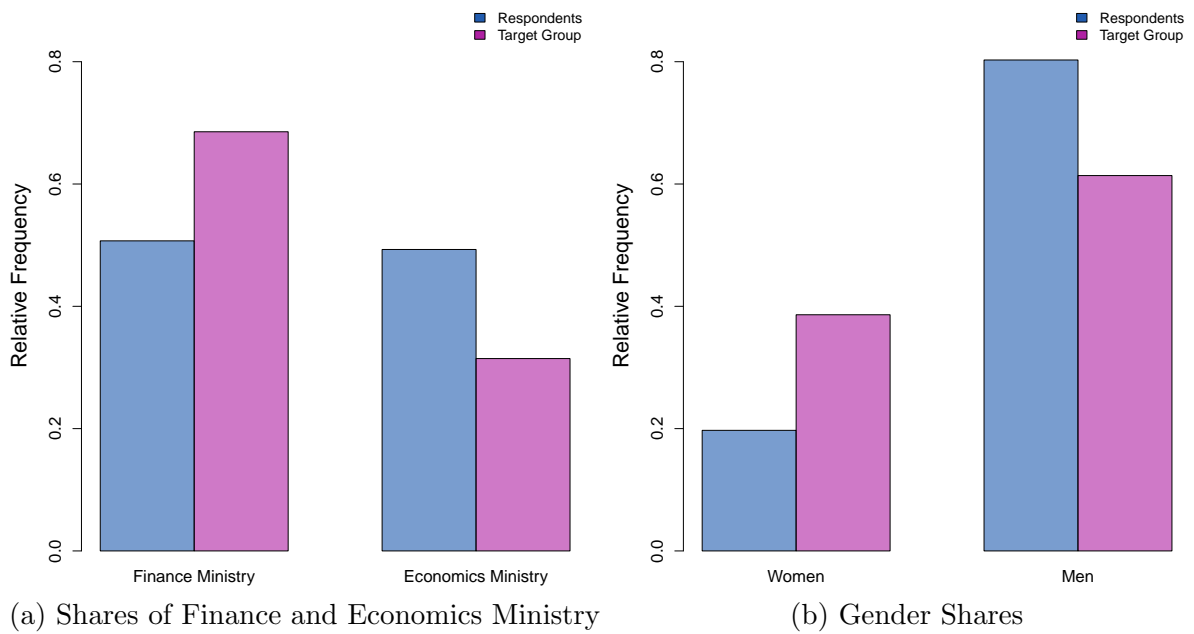
Figure A.1: Respondents vs. Target Group: Directorate-General and Hierarchy Shares



Notes: The figures compare the response group and the target group (i.e., the contacted set of senior government officials in the considered ministry Directorate-Generals) in terms of the shares of the different ministry Directorate-Generals (panel a) and ministry hierarchy levels (panel b). The Directorate-Generals in the Ministry of Finance are the Fiscal Policy & Economics Directorate-General (FM: Fiscal), the European Policy & International Fiscal Affairs Directorate-General (FM: Europe), and Directorate A and B in the Tax Directorate-General (FM: Tax). In the Ministry of Economic Affairs, the Directorate-Generals are the Economic Policy Directorate-General (EM: Econ) and the European Policy Directorate-General (EM: Europe). The target group comprises 393 persons and the response group consists of 74 persons (response rate of 18%). Regarding panel a, officials from the Fiscal Policy & Economics Directorate-General in the Finance Ministry and from the European Policy Directorate-General in the Economics Ministry are well represented. Officials from the Economic Policy Directorate-General in the Economics Ministry responded over-proportionally, while those from the European Policy & International Fiscal Affairs Directorate-General and the Tax Directorate-General in the Finance Ministry responded under-proportionally. We decided not to re-weight this in the empirical results analysis. It can be assumed that officials who deal with the topics of the survey more regularly are more likely to take part in the survey. This type of self-selection should not lead to a response bias. Regarding panel b, officials on higher levels responded over-proportionally to our survey. Here too, we decided against re-weighting in the empirical results analysis.

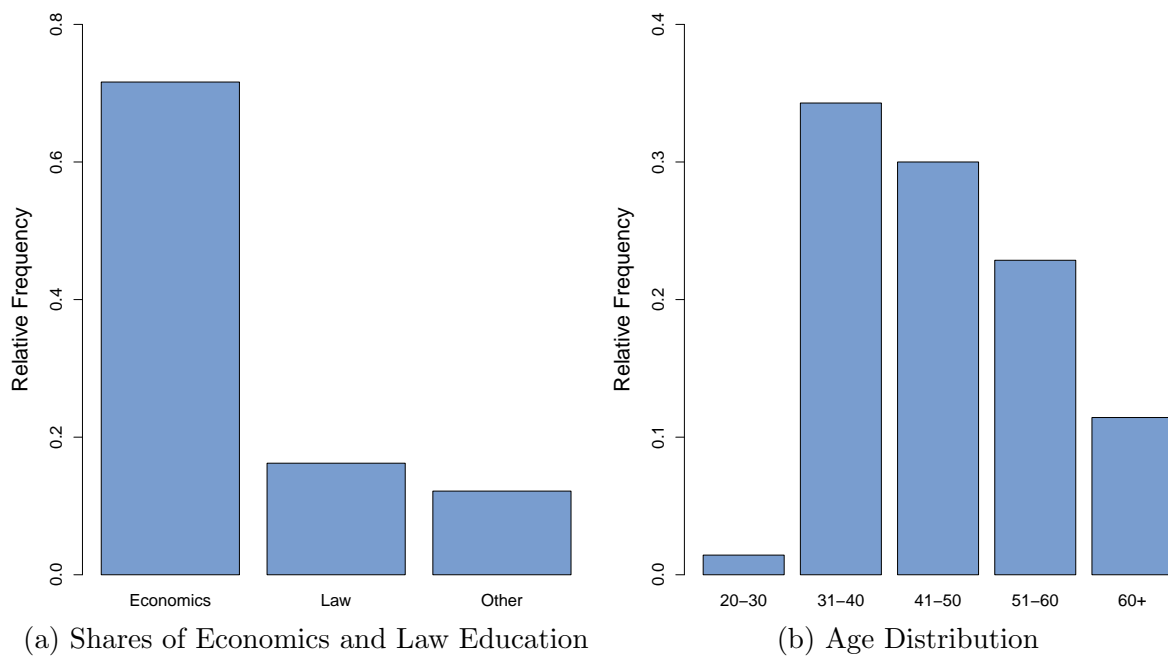


Figure A.2: Respondents vs. Target Group: Ministry and Gender Shares



Notes: The figures compare the response group and the target group (i.e., the contacted set of senior government officials in the considered ministry Directorate-Generals) in terms of the shares of the Ministry of Finance and the Ministry of Economic Affairs (panel a) and in terms of gender shares (panel b). The target group comprises 393 persons and the response group consists of 74 persons (response rate of 18%).

Figure A.3: Education and Age of Respondents



Notes: The figures depict the shares of respondents with economics, law, and other education (panel a) and the respondents' age distribution (panel b). These statistics were not available for the target group.

Table A.1: Summary Statistics

			Mean	Median	Min	Max	Std
Pre-treatment baseline projection:	GDP growth	2023	0.02	0.00	-6.50	2.90	1.35
Pre-treatment baseline projection:	GDP growth	2024	1.56	1.50	-0.50	4.00	0.93
Pre-treatment baseline projection:	GDP growth	2025	1.82	2.00	0.00	5.00	0.81
Pre-treatment baseline projection:	GDP growth	2030	1.59	1.50	-1.00	4.00	0.79
Transfer scenario projection:	GDP growth	2023	0.40	0.30	-6.00	3.50	1.30
Transfer scenario projection:	GDP growth	2024	1.63	1.55	0.00	4.00	0.91
Transfer scenario projection:	GDP growth	2025	1.81	2.00	-0.10	5.00	0.86
Transfer scenario projection:	GDP growth	2030	1.60	1.50	-1.00	4.00	0.80
Interest rate scenario projection:	GDP growth	2023	0.10	0.00	-6.50	3.00	1.47
Interest rate scenario projection:	GDP growth	2024	1.48	1.50	-0.50	4.00	0.93
Interest rate scenario projection:	GDP growth	2025	1.72	1.80	-0.10	4.50	0.85
Interest rate scenario projection:	GDP growth	2030	1.54	1.50	-1.10	4.00	0.80
Pre-treatment baseline projection:	Inflation	2023	7.44	7.90	2.80	12.00	1.73
Pre-treatment baseline projection:	Inflation	2024	4.84	4.50	2.00	10.00	1.92
Pre-treatment baseline projection:	Inflation	2025	3.27	3.00	1.00	8.00	1.39
Pre-treatment baseline projection:	Inflation	2030	2.48	2.00	-1.00	8.00	1.35
Transfer scenario projection:	Inflation	2023	8.04	8.00	3.00	15.00	1.98
Transfer scenario projection:	Inflation	2024	5.13	5.00	2.00	10.00	1.98
Transfer scenario projection:	Inflation	2025	3.40	3.00	1.00	9.00	1.53
Transfer scenario projection:	Inflation	2030	2.55	2.00	-1.00	8.00	1.50
Interest rate scenario projection:	Inflation	2023	7.56	7.50	2.50	14.00	1.83
Interest rate scenario projection:	Inflation	2024	4.71	4.05	1.80	10.00	1.99
Interest rate scenario projection:	Inflation	2025	3.12	2.65	1.00	7.00	1.33
Interest rate scenario projection:	Inflation	2030	2.50	2.00	0.00	8.00	1.33
Propensity to reduce overall spending			0.48	0.50	0.00	1.00	0.35
Propensity to increase overall income			0.52	0.50	0.00	1.00	0.35
Propensity to reduce public transfers			0.24	0.00	0.00	1.00	0.32
Propensity to reduce public spending			0.24	0.17	0.00	1.00	0.24
Propensity to increase taxes			0.17	0.10	0.00	1.00	0.22
Propensity to increase public debt			0.35	0.34	0.00	1.00	0.33
Marginal propensity to consume (MPC)			70.64	77.50	10.00	100.00	19.26
Share hand-to-mouth (h-t-m) consumers			41.51	40.00	2.00	100.00	27.87
ECB independence			76.34	80.00	30.00	100.00	17.4
Gender: Woman			0.18	0.00	0.00	1.00	0.38
Age			46.09	45.00	25.00	67.00	10.89
Education: Economics			0.74	1.00	0.00	1.00	0.44

Notes: The table summarizes the variables used in this paper. The first column denotes the variable. The columns Mean, Median, Min, Max, and Std indicate the mean, median, minimum, maximum, and standard deviation of the variable. The variables “Marginal propensity to consume (MPC)”, “Share hand-to-mouth (h-t-m) consumers”, and “ECB independence” are the respondents’ beliefs on the marginal propensity to consume in the German population (i.e., what percentage of the transfer received in the transfer program vignette is consumed on average within the first year (2023)), on the share of hand-to-mouth consumers in the German population (i.e., what proportion of people in the total population consumes 100% of the transfer received within the first year (2023)), and on the degree of factual independence of the ECB in the next ten years (on a scale from 0% = no independence to 100% = complete independence), respectively. The variable “Age” was collected in the form of ordinal dummy variables, with Age: 20-30, Age: 31-40, Age: 41-50, Age: 51-60, and Age: 60+. The regressions in the paper use this set of dummy variables. For this summary statistics table, the dummy variables have been converted into a cardinal variable, based on the midpoints of the respective age categories and with 67 as the maximum age (the official retirement age in Germany). “Gender: Women” is a dummy variables being one if the respondent is a woman and zero otherwise. “Education: Economics” is a dummy variable being one if the respondent has an academic education in economics and zero if they have an academic education in another subject (e.g., law).

Figure A.4: Survey Overview

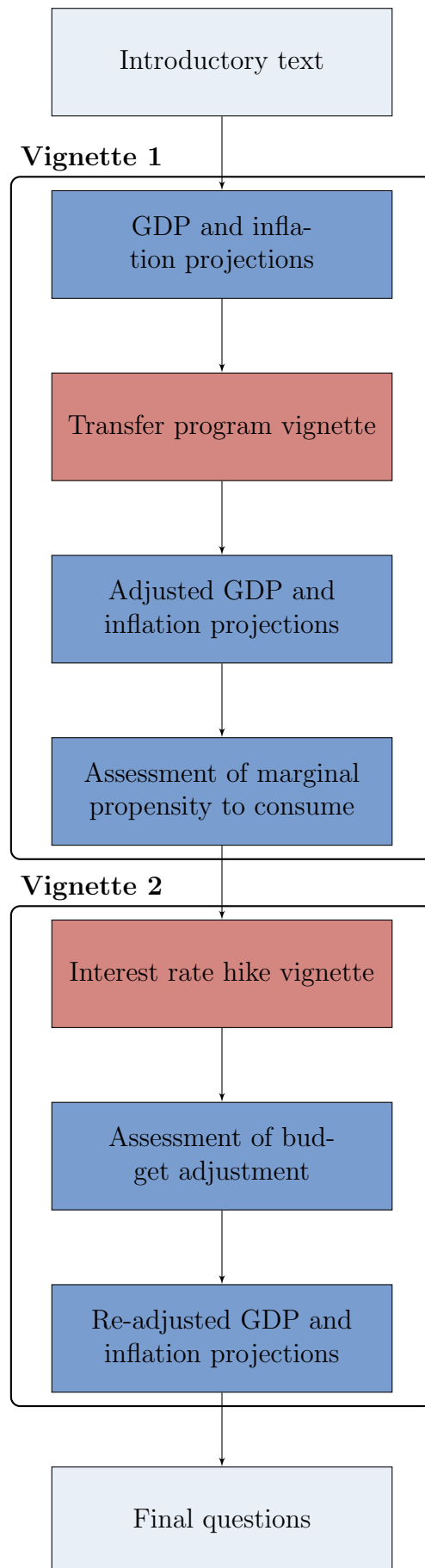
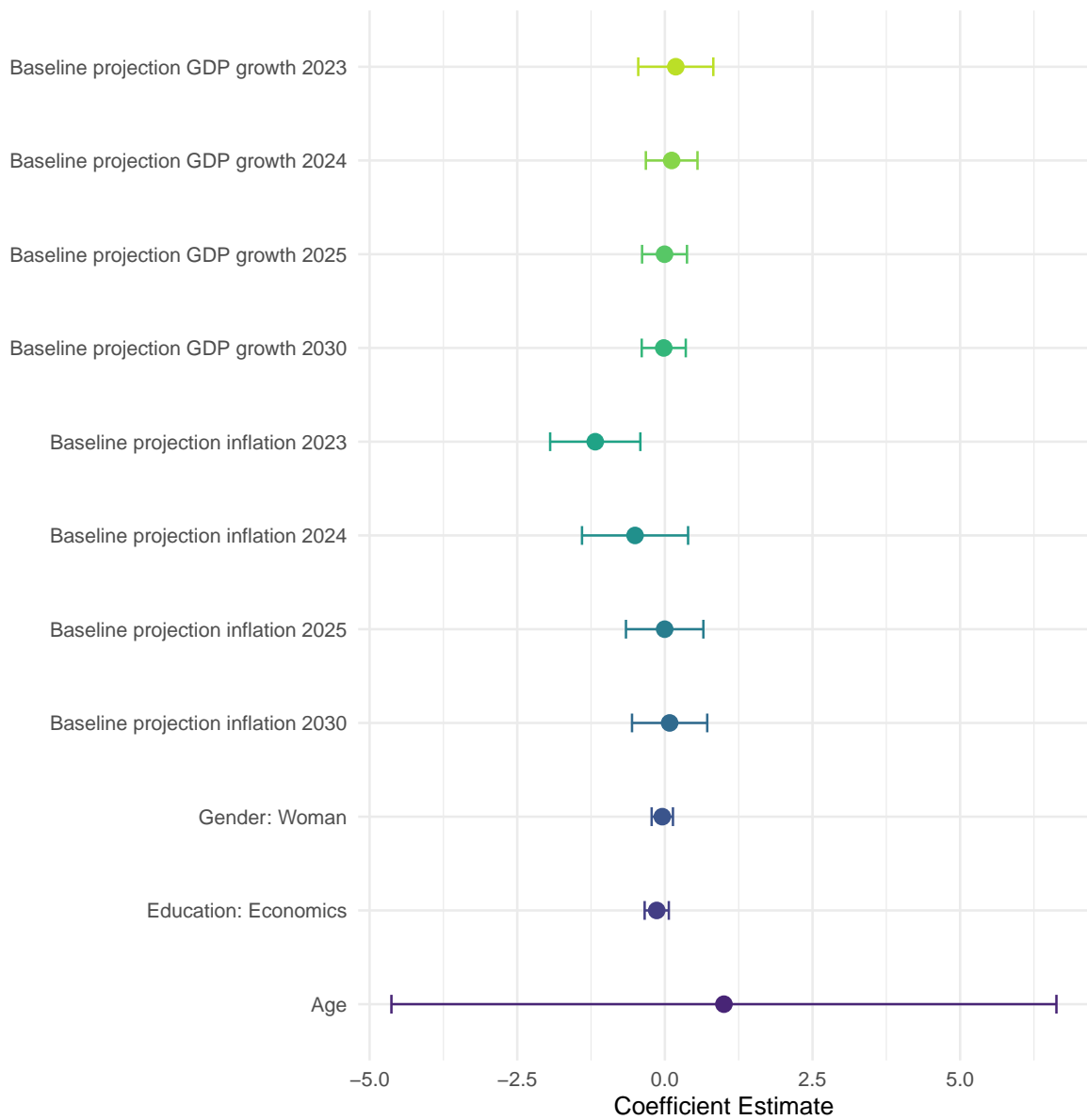
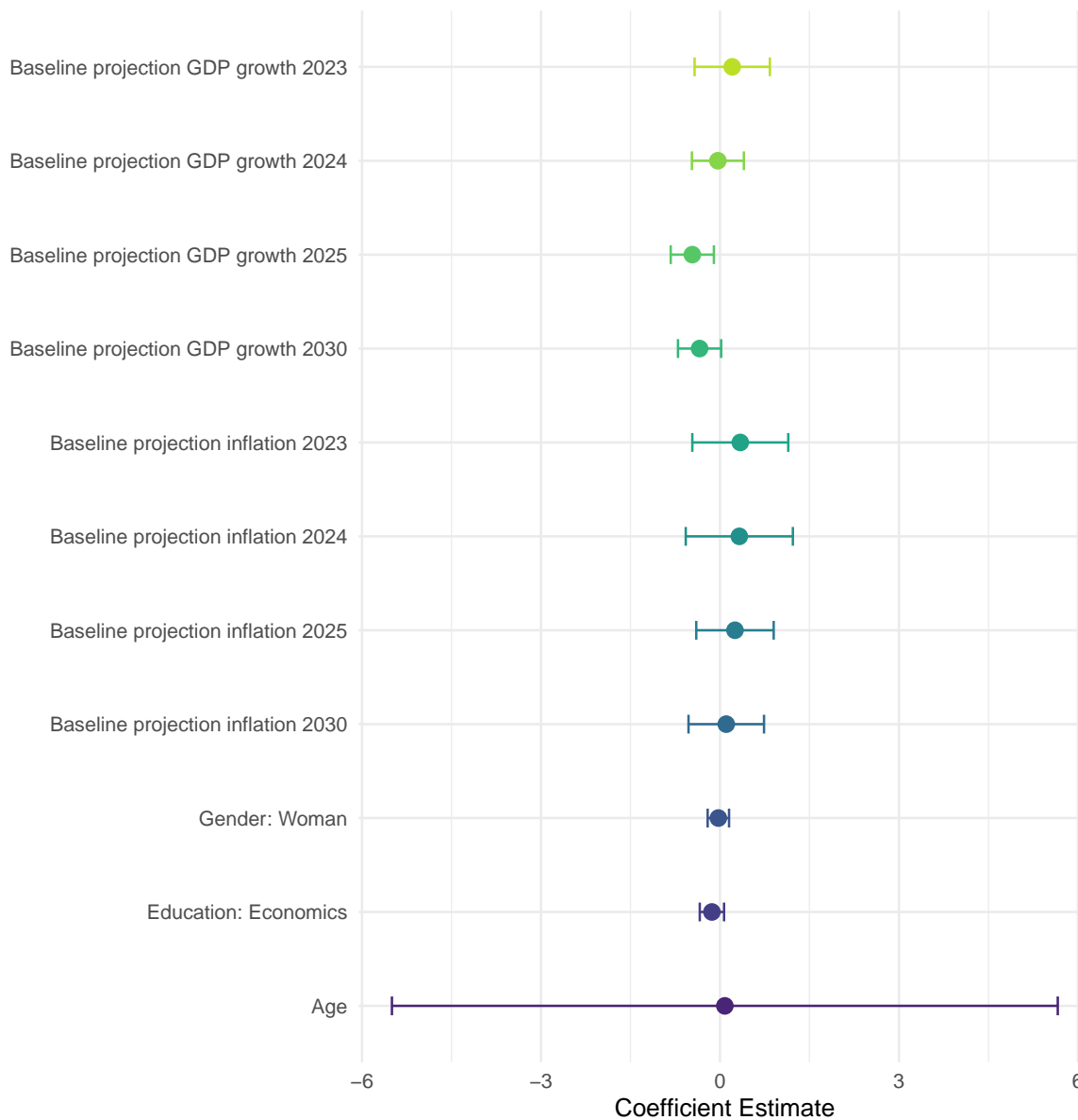


Figure A.5: Transfer Program Vignette: Balance Checks for Treatment Groups



Notes: The figure shows the coefficient estimates (shown by the dots) from separately regressing the variables printed on the y-axis on a constant and an indicator variable that takes value one (zero) if the respondent has been assigned to the high transfer (low transfer) treatment group (see Section 2.3). The whiskers show the 95% confidence intervals around the coefficient estimates. The employed estimation method is ordinary least squares.

Figure A.6: Interest Rate Hike Vignette: Balance Checks for Treatment Groups



Notes: The figure shows the coefficient estimates (shown by the dots) from separately regressing the variables printed on the y-axis on a constant and an indicator variable that takes value one (zero) if the respondent has been assigned to the high interest cost (low interest cost) treatment group (see Section 2.3). The whiskers show the 95% confidence intervals around the coefficient estimates. The employed estimation method is ordinary least squares.

## B Additional Empirical Results

Table B.1: Change in Expectations in Response to Shock – High vs. Low MPC

	Transfer Shock		Interest Rate Shock	
	GDP	Inflation	GDP	Inflation
	(1)	(2)	(3)	(4)
Year: 2023	0.116 (0.098)	0.282 (0.247)	-0.139 (0.155)	-0.410 (0.314)
Year: 2024	0.078 (0.098)	0.036 (0.247)	-0.145 (0.155)	-0.316 (0.314)
Year: 2025	-0.096 (0.098)	-0.086 (0.247)	-0.020 (0.155)	-0.288 (0.314)
Year: 2030	-0.061 (0.098)	-0.128 (0.247)	0.098 (0.155)	-0.151 (0.314)
MPC x Year: 2023	0.001 (0.001)	0.003 (0.003)	0.00002 (0.001)	-0.004 (0.003)
MPC x Year: 2024	-0.001 (0.001)	0.003 (0.003)	0.001 (0.001)	-0.004 (0.003)
MPC x Year: 2025	0.0001 (0.001)	0.003 (0.003)	-0.0002 (0.001)	-0.003 (0.003)
MPC x Year: 2030	-0.0002 (0.001)	0.003 (0.003)	-0.002 (0.001)	-0.003 (0.003)
Controls	Yes	Yes	Yes	Yes
Observations	296	296	280	280

Notes: The table reports the estimates of four individual-level regressions according to Equation (5), with the dependent variables being the percentage point change in the government officials' GDP growth forecasts or inflation forecasts in response to either the transfer shock scenario or the the interest rate shock scenario. Standard errors are in parentheses. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

Table B.2: Change in Expectations in Response to Shock (Active Control Group Setup)

	Transfer Shock		Interest Rate Shock	
	GDP	Inflation	GDP	Inflation
	(1)	(2)	(3)	(4)
Year: 2023	0.153*	0.690***	-0.112	-0.899**
	(0.083)	(0.163)	(0.182)	(0.376)
Year: 2024	-0.091	0.362**	-0.054	-0.666*
	(0.083)	(0.163)	(0.182)	(0.376)
Year: 2025	-0.180**	0.306*	-0.006	-0.595
	(0.083)	(0.163)	(0.182)	(0.376)
Year: 2030	-0.148*	0.181	0.030	-0.391
	(0.083)	(0.163)	(0.182)	(0.376)
Year: 2023 x Transfer: high	0.217***	0.058		
	(0.070)	(0.136)		
Year: 2024 x Transfer: high	0.049	0.086		
	(0.070)	(0.136)		
Year: 2025 x Transfer: high	0.096	-0.139		
	(0.070)	(0.136)		
Year: 2030 x Transfer: high	0.041	0.002		
	(0.070)	(0.136)		
Year: 2023 x Interest costs: high			-0.115	-0.079
			(0.080)	(0.166)
Year: 2024 x Interest costs: high			-0.003	-0.254
			(0.080)	(0.166)
Year: 2025 x Interest costs: high			-0.015	-0.201
			(0.080)	(0.166)
Year: 2030 x Interest costs: high			-0.045	-0.235
			(0.080)	(0.166)
Controls	Yes	Yes	Yes	Yes
Observations	296	296	280	280

Notes: The table reports the estimates of four individual-level regressions according to Equation (4), with the dependent variables being the percentage point change in the government officials' GDP growth forecasts or inflation forecasts in response to either the transfer shock scenario or the the interest rate shock scenario. Standard errors are in parentheses. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .



Table B.3: Test for Non-linearity in the Adjustment Propensities

	Propensity of							
	Transfer Decrease		Spending Decrease		Tax Increase		Debt Increase	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.21*** (0.06)	1.11** (0.51)	0.28*** (0.04)	-0.09 (0.41)	0.18*** (0.04)	-0.08 (0.37)	0.34*** (0.06)	0.05 (0.53)
Interest cost incr: high	0.07 (0.08)	0.06 (0.09)	-0.07 (0.06)	-0.10 (0.07)	-0.03 (0.05)	-0.00 (0.06)	0.03 (0.08)	0.04 (0.09)
GDP growth 2023		-0.02 (0.03)		0.00 (0.02)		0.01 (0.02)		0.00 (0.03)
Inflation 2023		0.01 (0.03)		0.02 (0.02)		-0.01 (0.02)		-0.02 (0.03)
MPC		-0.00 (0.00)		-0.00 (0.00)		0.00 (0.00)		0.00 (0.00)
Share h-t-m consumers		0.00 (0.00)		0.00 (0.00)		0.00 (0.00)		-0.00 (0.00)
ECB independence		-0.00* (0.00)		-0.00 (0.00)		0.00 (0.00)		0.00 (0.00)
Age: 31-40		-0.63* (0.34)		0.34 (0.27)		0.22 (0.25)		0.08 (0.35)
Age: 41-50		-0.61* (0.34)		0.31 (0.27)		0.13 (0.24)		0.17 (0.35)
Age: 51-60		-0.68* (0.34)		0.32 (0.27)		0.16 (0.24)		0.20 (0.35)
Age: 60+		-0.84** (0.35)		0.19 (0.28)		0.33 (0.25)		0.32 (0.36)
Education: Economics		0.04 (0.11)		-0.01 (0.09)		0.10 (0.08)		-0.13 (0.11)
Gender: Woman		0.04 (0.12)		0.01 (0.09)		-0.07 (0.08)		0.02 (0.12)
Transfer program: high		0.12 (0.09)		0.01 (0.07)		-0.03 (0.06)		-0.10 (0.09)
Observations	67	67	67	67	67	67	67	67

Notes: The table reports the estimates of four individual-level regressions, with the dependent variables being the fiscal adjustment propensity variables presented in Section 3. The regressions include a constant term, a dummy variable (named “Interest cost increase: high”) which is set to one for respondents who have been randomized to the high interest cost treatment arm (i.e., cost increase of €60 billion) and zero for those in the low interest cost treatment arm (i.e., cost increase of €30 billion), and various control variables (see Table A.1). The variables “GDP growth 2023” and “Inflation 2023” are the respondents’ pre-treatment baseline projections of annual GDP growth and annual inflation in 2023, respectively. The variable “Transfer program: high” is a dummy variable which is set to one for respondents who have been randomized to the high transfer treatment arm (i.e., transfer of €1000) and zero for those in the low transfer treatment arm (i.e., transfer of €500). Standard errors are in parentheses. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

Table B.4: Fiscal Adjustment (Active Control Group Setup), Robustness Regressions

	Transfer		Spending		Tax		Debt	
	Decrease		Decrease		Increase		Increase	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	6.21**	40.87	8.29***	-2.25	5.44***	-2.81	10.06***	-5.81
	(2.70)	(25.88)	(1.71)	(16.88)	(1.70)	(16.35)	(2.63)	(25.22)
Interest cost increase: high	10.46***	10.40**	3.83	2.98	3.80	4.64*	11.91***	11.99***
	(3.85)	(4.32)	(2.44)	(2.82)	(2.42)	(2.73)	(3.74)	(4.21)
GDP growth 2023		-0.92		0.12		0.24		0.56
		(1.56)		(1.02)		(0.99)		(1.52)
Inflation 2023		-0.27		0.76		-0.21		-0.28
		(1.39)		(0.91)		(0.88)		(1.36)
MPC		-0.07		-0.06		-0.03		0.17
		(0.16)		(0.11)		(0.10)		(0.16)
Share h-t-m consumers		0.02		0.02		0.03		-0.08
		(0.11)		(0.07)		(0.07)		(0.11)
ECB independence		-0.21*		0.04		0.00		0.17
		(0.13)		(0.08)		(0.08)		(0.12)
Age: 31-40		-17.52		9.52		7.18		0.82
		(17.31)		(11.29)		(10.94)		(16.87)
Age: 41-50		-15.12		8.09		5.15		1.88
		(17.21)		(11.23)		(10.88)		(16.77)
Age: 51-60		-17.64		6.91		4.64		6.10
		(17.29)		(11.28)		(10.92)		(16.84)
Age: 60+		-27.78		3.03		14.75		10.01
		(17.75)		(11.58)		(11.22)		(17.30)
Education: Economics		3.25		-1.79		4.63		-6.09
		(5.48)		(3.58)		(3.46)		(5.34)
Gender: Woman		1.94		1.10		-2.59		-0.45
		(6.00)		(3.91)		(3.79)		(5.84)
Transfer program: high		4.85		-0.79		0.00		-4.06
		(4.52)		(2.95)		(2.86)		(4.41)
Observations	67	67	67	67	67	67	67	67

Notes: The table reports the estimates of four individual-level regressions according to Equation (2), with the dependent variables being the budget adjustment in public transfers, government spending, taxes or public debt, respectively, made by the government officials in response to an unexpected increase in the interest costs. The regressions include a constant term, a dummy variable (named “Interest cost increase: high”) which is set to one for respondents who have been randomized to the high interest cost treatment arm (i.e., cost increase of €60 billion) and zero for those in the low interest cost treatment arm (i.e., cost increase of €30 billion), and various control variables (see Table A.1). The variables “GDP growth 2023” and “Inflation 2023” are the respondents’ pre-treatment baseline projections of annual GDP growth and annual inflation in 2023, respectively. The variable “Transfer program: high” is a dummy variable which is set to one for respondents who have been randomized to the high transfer treatment arm (i.e., transfer of €1000) and zero for those in the low transfer treatment arm (i.e., transfer of €500). Standard errors are in parentheses. \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$ .

## C Fiscal Adjustment Probabilities

In this section, we examine the probability of fiscal adjustments by ministry officials in response to unforeseen changes in interest rates. Our focus here is on the variations in transfers, government spending, taxes, and debt levels. Table C.1 shows the distinct probabilities for adjustments across different fiscal components. For example, the probability of a change in government spending is notably high at 67.2%. However, the likelihood of changing only one fiscal component is significantly lower across all categories. This demonstrates a nuanced approach to fiscal policy adjustments. Specifically, transfers have a 47.8% chance of being adjusted. Among the components that are adjusted, they have a 7.5% chance of being the only one adjusted and a 19.4% chance of being excluded from adjustments when other components are taken into account. In contrast, the data shows that debt adjustments have the highest overall probability at 68.7%, indicating a strong tendency to use debt leverage as a responsive instrument to rate changes.

Table C.1: Probability of Adjustment

	Adjust	Only	All, but
Public Transfers	47.8%	7.5%	19.4%
Government spending	67.2%	1.5%	3.0%
Taxes	55.2%	3.0%	10.4%
Public Debt	68.7%	9.0%	9.0%

Notes: The table shows the probability of ministry officials responding to an unanticipated interest rate change with a reduction in public transfers and government spending and an increase in taxes and public debt. The first column displays the overall probability of adjustment. The second column indicates the probability of adjusting only one fiscal component, while the third column shows the probability of adjusting all other fiscal components except the one specified in the respective row.

Table C.2 presents the conditional probabilities associated with the utilization of various fiscal instruments. For example, the table indicates that if a government agent employs the fiscal instrument “Transfers”, there is a 48.9% probability that they will also employ the fiscal instrument “Spending”. This demonstrates the interdependence between different fiscal instruments and provides insights into common patterns of fiscal policy implementation.

Table C.2: Conditional Probability of Adjustment

	Public Transfers	Government Spending	Taxes	Public Debt
Public Transfers	100.0%	48.9%	43.2%	34.8%
Government spending	68.8%	100.0%	73.0%	71.7%
Taxes	50.0%	60.0%	100.0%	54.3%
Public Debt	50.0%	73.3%	67.6%	100.0%

Notes: The table reports the conditional probabilities of using different fiscal instrument. For instance, the probability that a government agent who uses the fiscal instrument “Public Transfers” also uses the fiscal instrument “Government Spending” is 48.9%.

## D Questionnaire

Welcome to the online survey by the KOF Swiss Economic Institute at ETH Zurich. Your responses support a current empirical research project on expectation formation in economic policy.

Please note that the survey is not intended to evaluate your answers. There are no right or wrong answers for any of the questions asked.

The survey is conducted in an anonymized form. For each participant, we will donate €20 to a charitable cause that you can choose at the end of the survey.

*Please remember for the entire survey: If entering a decimal number in an answer field, please use a dot (instead of a comma). For example, 1.5% (instead of 1,5%).*

1. I expect the following average annual growth of real Gross Domestic Product (GDP) for Germany (in % with one decimal place):

2023  %

2024  %

2025  %

2030  %

2. I expect the following average annual consumer price inflation rate (in % with one decimal place):

2023  %

2024  %

2025  %

2030  %

In the following, consider the following scenario:

The Federal Government is considering the introduction of a transfer program in 2023. It is to have a volume of €40 billion and be equipped as follows: Every person in Germany will receive a one-time payment of €500 at the beginning of 2023 for immediate and free use. The program is to be announced at the beginning of January 2023 and implemented immediately. Until this point, no information is publicly available.

The €40 billion is to be added to the previously planned budget. The transfer program is to be financed by an increase in new borrowing. For the purposes of this study, assume hypothetically that the German debt brake and the European debt rules do not stand in the way of the program.

In order to be able to estimate the economic effects of the transfer program, you are asked for your assessment.

As a reminder, your previous forecast for annual real GDP growth in % (i.e., your forecast without the transfer program):

- 2023: Previously indicated value %
- 2024: Previously indicated value %
- 2025: Previously indicated value %
- 2030: Previously indicated value %

3. According to your rough estimate: What annual growth in real Gross Domestic Product (GDP) (in %) do you expect taking into account the transfer program?

2023	<input type="text"/>	%
2024	<input type="text"/>	%
2025	<input type="text"/>	%
2030	<input type="text"/>	%

As a reminder, your previous forecast for the inflation rate in % (i.e. your forecast without the transfer program):

- 2023: Previously indicated value %
- 2024: Previously indicated value %
- 2025: Previously indicated value %
- 2030: Previously indicated value %

4. What annual consumer price inflation (in %) do you expect, taking into account the transfer program?

2023	<input type="text"/>	%
2024	<input type="text"/>	%
2025	<input type="text"/>	%
2030	<input type="text"/>	%

People can either consume or save the unexpected income transfer resulting from the federal government's program described above.

5. Please give a rough estimate: What percentage of the transfer received (€500) will be consumed on average within the first year (2023)? \*

% of the amount received

6. Please give a rough estimate: What proportion of people in the total population consumes at least 80% (i.e., €400 or more) of the transfer received within the first year (2023)? \*

% of the total population

7. Please give a rough estimate: What proportion of people in the total population will consume 100% of the transfer received within the first year (2023)? \*

% of the total population

8. Please give a rough estimate: What proportion of people in the total population does not consume the transfer they receive at all (i.e., 0%) within the first year (2023)? \*

% of the total population

**Explanation:**

Consumption is to be understood as: Purchases of goods and services, i.e., consumer goods such as food, clothing, cosmetics, travel, vacations, and entertainment as well as durable goods such as cars, home improvement, furniture, and electronics. Saving includes deposits in current or savings accounts, investments in securities (shares, bonds, etc.), and the repayment of debts.

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The federal government's transfer program plans described above are currently only known to selected circles within the government. The European Central Bank (ECB) has no knowledge of this.

Irrespective of the German government's plans, the ECB has decided to increase interest rates more than expected in order to counteract the current inflationary pressure. This interest rate increase implies an unexpected increase in the federal government's interest costs from 2023 of €10 billion per year on average over the next 3 years. Cumulatively over 3 years, the federal government's interest costs will therefore increase unexpectedly by €30 billion.

Please give your assessment of how, in view of the additional interest costs (€30 billion), the revenue and expenditure policy should be adjusted over the next 3 years. Specifically, the following adjustments are under consideration:

- Reduction of the planned transfer program
- Reduction of other government spending
- Increase in taxes
- Increased new debt

9. Change in revenue/expenditure 2023-2025 in billions by:

Reduction of the planned transfer program	<input type="text"/>
Reduction of other government spending	<input type="text"/>
Increase in taxes	<input type="text"/>
Increased new debt	<input type="text"/>

As a reminder, your previous forecast for annual real GDP growth in % (i.e., your forecast incl. transfer program, but without interest rate increase and without adjusted revenues/expenditures):

- 2023: Previously indicated value %
- 2024: Previously indicated value %
- 2025: Previously indicated value %
- 2030: Previously indicated value %

10. Please provide an estimate: What annual growth in real GDP (in %) do you expect in the new scenario (i.e., taking into account the transfer program, the interest rate increase, and the adjusted income/expenditure)

2023	<input type="text"/>	%
2024	<input type="text"/>	%
2025	<input type="text"/>	%
2030	<input type="text"/>	%

As a reminder: Your previous forecast for the inflation rate in % (i.e., your forecast including the transfer program, but without the interest rate increase and without adjusted income/expenditure):

- 2023: Previously indicated value %
- 2024: Previously indicated value %
- 2025: Previously indicated value %
- 2030: Previously indicated value %

11. Please enter your new forecast for the inflation rate in % here (i.e., your forecast taking into account the transfer program, the interest rate increase, and any adjusted income/expenditure):

2023	<input type="text"/>	%
2024	<input type="text"/>	%
2025	<input type="text"/>	%
2030	<input type="text"/>	%

12. We would now like to ask you for your assessment of the independence of the European Central Bank. The independence of the central bank refers to the freedom of monetary policy decision-makers from political or state influence on the implementation of monetary policy.

What degree of independence do you think the European Central Bank will have in the next ten years? In percent (0% = no independence to 100% = complete independence)

%

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13. Age \*

- 20 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 60 +
- Not Specified

14. Gender \*

- Male
- Female
- Diverse
- Not Specified

15. Professional Background

- Economist
- Lawyer
- Other
- Not Specified

If Other, please specify:

16. For your participation, we will donate €20 to a charitable cause. You can either specify the charitable cause or the charitable organization.

Charitable cause / organisation:

- No donation desired



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