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Working Paper 29442  
<http://www.nber.org/papers/w29442>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
October 2021

The authors thank Satyajit Dutt for excellent research assistance. The views expressed in this paper represent the authors' personal opinions and do not necessarily reflect the views of the Deutsche Bundesbank or the Eurosystem. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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A Temporary VAT Cut as Unconventional Fiscal Policy

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NBER Working Paper No. 29442

October 2021

JEL No. D12,E20,E21,E62,E65,H31

**ABSTRACT**

We exploit the unexpected announcement of an immediate, temporary VAT cut in Germany in the second half of 2020 as a natural experiment to study the spending response to unconventional fiscal policy. We use survey and scanner data on households' consumption expenditures and their perceived pass-through of the tax change into prices to quantify its effects. The temporary VAT cut led to a substantial relative increase in durable spending of 36% for individuals with a high perceived pass-through. Semi-and non-durable spending also increased. According to our preferred estimates, the VAT policy increased aggregate consumption spending by 34 billion Euros.

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# 1 Introduction

Monetary policy is often considered the preferred tool to stabilize business cycles because it can be implemented swiftly and because it does not rely on large fiscal multipliers. When the effective lower bound (ELB) on nominal interest rates limits the ammunition of conventional monetary policy, alternative policy measures are needed. Unconventional fiscal policy uses changes in consumption taxes to engineer an increasing path of future prices of consumption goods, either through pre-announced increases or immediate, temporary cuts. With nominal interest rates fixed at the ELB, unconventional fiscal policy acts as a potential stimulus because higher expected future prices are tantamount to lower current real interest rates, which should incentivize spending today. The theoretical channel through which unconventional fiscal policy stimulates aggregate demand is, hence, very similar to the transmission channel of conventional monetary policy and operates through the consumption Euler equation (Correia, Farhi, Nicolini, and Teles, 2013; D’Acunto, Hoang, and Weber, 2018, 2021).

We exploit the unexpected announcement of the German federal government on June 3rd, 2020 to temporarily cut the value added tax (VAT) rate by 3 percentage points to study the effectiveness and transmission channels of unconventional fiscal policy. The announcement was passed into law on June 29th, 2020, became effective a few days later on July 1st, 2020, and lasted until December 31st, 2020.<sup>1</sup> Using survey methods and scanner data, we find that Germans substantially increased their consumption expenditures, especially on durable goods, during the period of lower VAT.

In addition to changing intertemporal trade-offs, a temporary VAT cut also has a temporary positive income effect for consumers (see, for a general discussion of the theoretical effects, Blundell, 2009).<sup>2</sup> Furthermore, with a VAT policy, stabilization is targeted at a very broad-based macroeco-

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<sup>1</sup>To be precise, the regular VAT rate was cut by 3 percentage points from 19% to 16%. Germany also has a reduced VAT rate which was cut by 2 percentage points from 7% to 5%. The reduced VAT rate is applied to a particular group of products such as books, take-away food, and others. The standard VAT rate, in expenditure terms, applies to roughly half of the German consumption basket, the reduced rate to just under 20%. The rest, mostly rent payments, is not subject to VAT (see Egner, 2021). We note that in Germany, the VAT is a federal tax.

<sup>2</sup>Both the intertemporal substitution and the positive income effect of a temporary VAT cut are only operative to the extent that retailers pass the lower taxes through to consumer prices. The literature has demonstrated that such pass-through indeed occurred, consistent with theory, in that the pass-through was stronger in more competitive industries. See Fuest, Neumeier, and Stöhlker (2020) for retail prices, Montag, Sagimuldina, and Schnitzer (2021) for gasoline prices, and Deutsche Bundesbank (2020) and Egner (2021), from the German Federal Statistical Agency, for aggregate consumer price inflation. Blundell (2009) discusses the evidence for other countries and finds generally similarly high pass-through. See also Benzarti, Carloni, Harju, and Kosonen (2020) for a study of the potential asymmetries in (permanent) VAT change pass-through for a number of European Union countries.

conomic aggregate and does not require political micromanagement. It is also a very direct measure in that households have to buy something in order to fully benefit from the policy, in contrast to transfers which can be saved. Finally, from a practical point of view, VAT changes can be relatively easily and quickly implemented in the software systems of vendors.

In principle, changes in the VAT rate affect all consumers in an economy. Therefore, identifying their causal effect is difficult. In addition, during the second half of 2020, Germany was in the midst of the Covid-19 pandemic and an accompanying recession. The stated purpose of the temporary VAT cut was, therefore, to stimulate the German economy. It was part of a larger stimulus package, which also included, for instance, a direct transfer payment for families with children and a number of tax relief measures for firms. Finally, the second half of any year exhibits particular seasonal spending patterns (summer vacations and Christmas). To tackle these empirical challenges, we employ survey methods. We do so in two steps.

First, from an ex-ante perspective, we elicited in July of 2020 qualitative spending plans for durables for the second half of 2020 and the level of informedness about the change in VAT. Most consumers knew about the cut in VAT but only a subset of them knew about the return to normal rates in January 2021. We split survey participants into those that were informed about the complete VAT path and others. Our argument is that only the former group has an intertemporal substitution motive, while the latter group has only an income effect.<sup>3</sup> Comparing the spending plans of the two groups, the ex-ante analysis, therefore, allows us to identify, along the extensive margin, a lower bound for the intertemporal substitution effect of the VAT policy on planned durable spending.

We establish with the ex-ante approach the existence of statistically and economically significant VAT-induced intertemporal substitution in durable consumption expenditures. Specifically, the VAT policy makes households about 10 percentage points more likely to increase durable purchases relative to the second half of a normal year.

Second, from an ex-post perspective, we asked in January of 2021 survey participants about their realized durable consumption spending in Euro during the second half of 2020. We supplement the survey data for durables with scanner data covering Euro spending on semi-durables

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<sup>3</sup>To be precise, those that knew that the VAT rate would increase again after six months also had a temporary perceived income effect, which should have been, however, much smaller than the perceived income effect of those who only knew about the VAT cut.

and non-durables. We achieve identification by separating survey respondents according to their retrospectively perceived pass-through of the VAT cut to consumer prices. Consumers who do not believe that after-tax prices changed have again no motive to engage in intertemporal consumption substitution. They do not perceive an income effect, either. Therefore, by comparing the spending behavior of consumer groups with different perceived VAT pass-through, we can identify the causal effect of the VAT policy on consumption spending.

We find that the temporary VAT cut led to a substantial relative increase in durable spending. According to our preferred estimate, households with a high perceived pass-through spent about 36% more than those with low or no perceived pass-through. Similarly, using scanner data, we find that semi- and non-durable spending was higher for households that perceived a high pass-through relative to other households by about 11% and 2%, respectively. That is, the VAT policy effect is increasing in the durability of the consumption good, consistent with a simple Euler-equation argument. We also find that the VAT policy effect, in particular for more durable goods, increases over time and is maximal right before the reversal of the VAT rate (see McKay and Wieland, 2021b, for similar effects from monetary policy). In a back-of-the-envelope calculation, these micro estimates translate into an aggregate effect of 21 billion Euros of additional durable spending and of 34 billion Euros of overall consumption spending due to the temporary VAT cut. The combined effect of increased consumption spending and the lower effective VAT tax rate resulted in a revenue short-fall for the fiscal authorities of 7 billion Euros.

In the cross-section of consumers, we find that two not necessarily overlapping groups of consumers drive the durable spending response: first, bargain hunters, i.e., households that self-report to shop around, or households that, in a survey experiment, turn out to be particularly price sensitive; second, younger households in a relatively weak financial situation. We also find no evidence that perceived credit constraints of households matter. Finally, the stabilization success of the temporary VAT cut is also related to its simplicity (Andre, Pizzinelli, Roth, and Wohlfart, 2021; D’Acunto, Hoang, Paloviita, and Weber, 2021). Its effect is not concentrated in households that are particularly financially literate or have long planning horizons for saving and consumption decisions. Hence, in contrast to unconventional monetary policy which often relies on consumer sophistication (see, e.g., Farhi and Werning, 2019; Gabaix, 2020; Woodford, 2019, for the case of forward guidance), unconventional fiscal policy is successful in stimulating aggregate consumption

spending because of its simplicity and salience, consistent with the theoretical and empirical arguments in Bianchi-Vimercati, Eichenbaum, and Guerreiro (2021) and D’Acunto, Hoang, and Weber (2021). Taken together, these findings suggest that the temporary VAT cut not only had a positive stabilization effect but also positive distributional implications consistent with the idea that a VAT cut works in a progressive way.

The literature evaluating temporary VAT cuts and their stimulative and distributional consequences is relatively scant, partly because the idea of unconventional fiscal policy is relatively new and partly because the identification of its effects requires appropriate data. We propose surveys in which we elicit both (quantitative) spending data and data on the households’ subjective perception of the temporary VAT cut as a means to overcome the identification problem. We show that such perceptions are independent of households’ stated spending reasons and spending habits. Surveys also provide us with substantial socio-demographic information and allow us to elicit psychological household characteristics that help us understand the mechanism through which unconventional fiscal policy works. Crossley, Low, and Sleeman (2014) study the 2008 temporary VAT cut in the UK using other European countries as a control group. For the German context, Bachmann, Bayer, and Kornejew (2021), Behringer, Dullien, and Gechert (2021), and Fuest, Neumeier, and Peichl (2021) provide descriptive evidence regarding the extensive margin effect of the VAT cut that is broadly in line with our evidence.

## 2 Data

For the ex-ante approach, we added supplementary questions to the July 2020 wave of the Bundesbank Online Household Panel (BOP-HH), which is a representative online panel of the German population with well over 2,000 survey participants. The survey has been running monthly since April 2020 and focuses on eliciting subjective expectations.<sup>4</sup>

For the ex-post approach, we make use of two separate surveys. First, we added supplementary questions to the January 2021 wave of the BOP-HH, which went into the field after the VAT rates had been raised back to their original levels. Second, we commissioned a survey with about 10,000 participants through the Gesellschaft für Konsumforschung (GfK), a German survey firm

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<sup>4</sup>The design follows the New York Fed Survey of Consumer Expectations (Crump, Eusepi, Tambalotti, and Topa, 2021), and the survey was thoroughly tested with three pilot waves in 2019.

specializing in consumer-oriented research.<sup>5</sup> Except for standard socio-demographic background questions, we document all survey questions we use in this paper in online Appendix B.

All three surveys elicit information about monthly net household incomes in the form of income brackets, of which we take the mid-point as the household’s net income level. In addition, each survey asks for information about monthly non-durable consumption, either retrospectively or prospectively in the form of spending plans. We impose the following sample restrictions using these data. First, we limit the sample to households with a ratio of monthly non-durable consumption expenditures to monthly income below 1.5. Second, we eliminate monthly non-durable consumption expenditures below 100 and above 10,000 Euros.<sup>6</sup> Altogether, we eliminate 12%, 2%, and 5% of the observations, respectively, for the BOP-HH July 2020, BOP-HH January 2021, and GfK January 2021 surveys.<sup>7</sup>

### 3 Results

We first discuss the results from our ex-ante approach, which establishes the existence of statistically and economically significant intertemporal substitution towards durable consumption expenditures during the second half of 2020 due to the VAT policy. Afterwards, with our ex-post approach, we quantify the aggregate economic significance of the VAT policy.

#### 3.1 The ex-ante approach

For the ex-ante approach, we proceed with a qualitative question and ask survey participants in the BOP-HH July wave whether their planned durable consumption spending in the second half of 2020 is more, the same, or less than in a normal second half of a year.

In addition, we asked those households that were planning to spend more on durables for their reasons of doing so. Panel A of Figure 1 shows the most important reasons are of an idiosyncratic

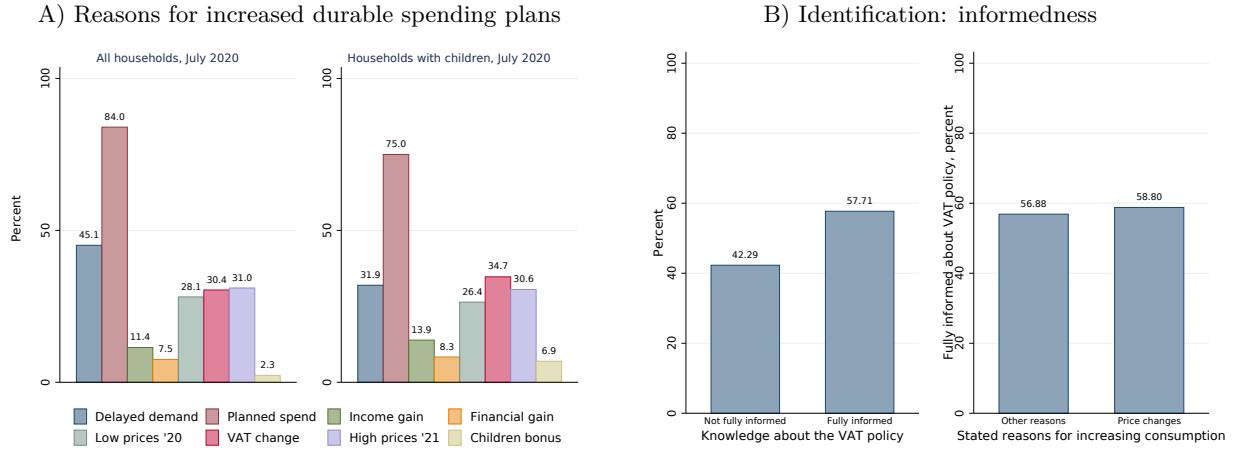
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<sup>5</sup>The GfK, for example, provides the German input to the EU-harmonized consumer sentiment survey.

<sup>6</sup>Given the different foci of the three surveys, we implement “monthly non-durable consumption expenditures” slightly differently across surveys: for the BOP-HH July 2020 survey, we use the expected monthly non-durable consumption expenditures for the second half of 2020 (Q11 in online Appendix B); for the BOP-HH January 2021, the actual non-durable consumption expenditures from the previous month (Q17); and for the GfK January 2021, we use realized average monthly non-durable consumption expenditures for the second half of 2020 (Q25).

<sup>7</sup>Given the focus on expectations in the BOP-HH July 2020 survey, we implement a third sample restriction: expected non-durable consumption expenditures for the second half of 2020 is less than twice the typical expenditures for a second half of a year.

Figure 1: The ex-ante approach



*Notes:* Panel A: After the respondents answered the question about their durable spending plans (Q2 in online Appendix B), those that answered with an increase were asked about their reasons for planning to do so (Q3). They were given eight reasons which they could evaluate on a four-point intensity scale. Panel shows the fractions of respondents that chose the highest two answers on this intensity scale. Panel B, left-hand side: shows fraction of respondents that were informed about the full VAT path (Q1). Panel B, right-hand side: shows share of fully informed for those survey respondents that plan to increase their durable consumption spending in the second half of 2020, split into those that self-report price changes and those that give other reasons. “Price changes” comprises “VAT changes”, “Low prices ’20”, and “High prices ’21”; “Other reasons” comprises the rest.

nature, e.g., long-standing spending plans. Increases in asset values and income play a relatively minor role. Importantly, the VAT policy directly, but also indirectly through expected lower prices in the second half of 2020 and expected higher prices in 2021, constitutes the second most important group of reasons for households to increase their planned durable spending. Finally, Figure 1, Panel A, also shows that the children bonus (“Kinderbonus”), a direct transfer payment of 300 Euros per child for families with children, which was also part of the German stimulus package announced in June 2020, played only a minor role. The right-hand side of Panel A shows that, even focusing on families with children, the VAT policy dominates the children bonus.

To isolate the effect of the VAT policy on consumption spending from other channels, we elicit survey participants’ level of informedness about it. While almost all consumers knew in July 2020 that the VAT was cut in that same month, only about 60 percent knew about the full path, i.e., they also knew about the planned (and indeed later executed) return to the old value in January 2021 (see the left-hand side of Panel B in Figure 1).<sup>8</sup>

<sup>8</sup>The question that elicits the degree of the participants’ informedness was asked after the consumption questions without the possibility to go back in the questionnaire.



We then estimate a regression in which the qualitative durable consumption spending plans are regressed on a dummy variable which takes a value of zero when survey respondents state that they only know about the decline in the VAT but not about the return to normal rates in January 2021; and which takes a value of one when survey respondents are informed about the complete VAT path. Our argument is that the coefficient on this dummy variable captures a lower bound of the causal intertemporal substitution effect (through durable consumption spending) of the temporary VAT cut as the perceived income effect should be larger for the not fully informed.

One might be worried about reverse causality in our approach: consumers who plan to buy durables for other reasons than the VAT cut might have a higher probability of being informed about the full future VAT path. After all, for them it would be important to know the reversal date to not miss out on the cheaper spending opportunity. The right-hand side of Panel B in Figure 1 shows that this concern is not warranted. The graph presents the share of fully informed households, split into those that self-report price (including VAT) changes as a reason for their planned durable consumption spending increase in the second half of 2020, and those that give other reasons unrelated to prices. Both groups are similarly informed about the full VAT path. In particular, consumers planning to increase their durable consumption spending in the second half of 2020 for reasons unrelated to prices, e.g., long-standing spending plans, are not better informed about the full VAT path than those that report price changes. We will revisit this reverse causality concern in the ex-post analysis below and argue that it is unlikely to drive our results.

Table 1, columns (1) and (2), presents our estimation results: Informed households are about 10 percentage points more likely to increase durable purchases compared to uninformed consumers and relative to the second half of a normal year. To put this number into perspective, we gather from the BOP-HH January 2021 wave that, in the second half of 2020, 29% of respondents did not buy any durables at all. A 10 percentage-point change in the extensive margin of durable consumption spending is, therefore, economically significant. In addition, these ex-ante results alleviate concerns that consumers in our ex-post analysis aim to justify their shopping behavior in the second half of 2020 through simply claiming that they perceived low prices. We, finally, note that splitting this regression into regions with high/low previous Covid-19 exposure does not change our baseline result (see Table A.2 in Appendix A).

Table 1: Durable spending plans and knowledge about the VAT path, July 2020 survey

Plans to buy durables 2020HY2 vs. typical second half-year	Full Sample		Net Wealth		Expected Income Change			Age			Expected Inflation	
	w/o controls (1)	controls (2)	Low (3)	High (4)	Low (5)	High (6)	Young (7)	Mid (8)	Old (9)	Low (10)	High (11)	
Fully informed	0.098*** (0.033)	0.083*** (0.032)	0.163*** (0.048)	0.026 (0.044)	0.182*** (0.049)	0.024 (0.044)	0.153** (0.066)	0.097* (0.056)	0.078 (0.049)	0.039 (0.059)	0.109*** (0.042)	
Constant	-0.241*** (0.025)	-0.311*** (0.101)	-0.378*** (0.034)	-0.112*** (0.035)	-0.364*** (0.035)	-0.134*** (0.034)	-0.146*** (0.048)	-0.246*** (0.044)	-0.304*** (0.038)	-0.159*** (0.047)	-0.256*** (0.031)	
Observations	1,794	1,791	806	978	770	988	462	601	731	559	1,100	

*Notes:* Results based on OLS regressions using data from the July 2020 wave of BOP-HH. We code the answer to Q2 in online Appendix B “more durable consumption spending than in a normal year” as +1, “same” as 0, and “less” as -1. Column (2) includes additional controls for gender, age, education, employment status, having children, the households’ income level and net wealth, as well as controls for the federal state and the municipality size the household lives in. Table A.1 in Appendix A reports the coefficients on the controls and also presents results for a regression in which, in addition to the household-specific socio-economic controls, we add a battery of the households’ expectations about relevant idiosyncratic and aggregate economic variables. For the low/high cuts, we always use the median of the corresponding variable as threshold. “Young” denotes below age 45, “Mid” between 45 and 60, and “Old” above 60. The splits for “Net Wealth”, “Expected Income Change”, and “Expected Inflation” are based, respectively, on Q4–Q6. Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Next, we estimate a number of regressions with sample splits to tease out potential heterogeneities in planned durable consumption spending and to analyze possible transmission channels of the VAT policy. We report the results in columns (3)–(11) of Table 1. The intertemporal substitution effect is stronger for households with low own income change expectations over the next twelve months. In that sense, the temporary VAT cut has a progressive effect. This effect is also reflected in the results by net wealth. The positive effects of the VAT policy are also stronger for younger households.

These results raise the question whether household age and net wealth/expected income change merely proxy for each other in these split-sample regressions. Table A.3 in Appendix A shows that this is indeed the case: it is young and middle aged households in a less favorable financial situation, i.e., low net wealth and low expected incomes, that drive the aggregate intertemporal substitution effect. By contrast, young and middle aged households that find themselves in a financially favorable situation and old households, regardless of their financial situation, do not appear to exhibit a positive intertemporal substitution effect.

Finally, the last two columns of Table 1 show that an intertemporal substitution channel likely explains our results: The positive effect of the temporary VAT cut on durable spending is concentrated in households that expect high future inflation (a question that is asked in the standard part of the BOP-HH), that is, for consumers with a stronger intertemporal substitution motive.<sup>9</sup>

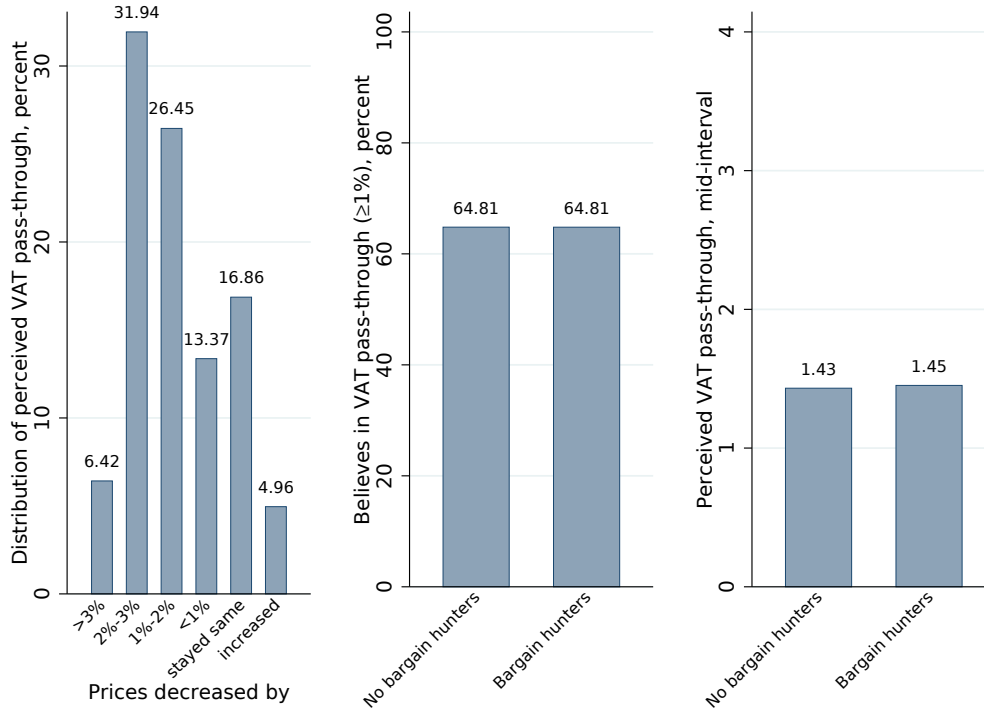
### 3.2 The ex-post approach

For the ex-post approach, we ask participants in two separate surveys about their realized durable consumption spending in Euro during the second half of 2020: BOP-HH January 2021 and GfK January 2021. In addition, we elicit the survey participants’ perceived pass-through of the VAT cut to consumer prices in both surveys. Approximately two thirds of households perceived a pass-through to consumer prices of equal to or more than 1% in the BOP-HH January 2021 (see Figure

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<sup>9</sup>The recent HANK literature has also discussed financial constraints as a potential limit to intertemporal substitution. In Germany, it turns out that households do not self-report to be constrained. For example, only three percent in the July 2020 wave of BOP-HH report that they could not borrow to cover their expenditures next month. The vast majority—more than 80 percent—is confident that they can cover their expenditures out of their flow incomes. An additional 11 percent might have to tap into their savings and 5 percent report to be able to borrow with difficulties in order to cover their expenditures. The numbers are nearly identical for expenditures over the next six months. Finally, the July 2020 wave of BOP-HH is not special in this regard. We see similar numbers in the April and May waves of the BOP-HH as well as, in response to a slightly different question, in the third (2017) wave of the German Panel on Household Finances (PHF).

Figure 2: The ex-post approach. Identification: perceived pass-through



*Notes:* Graphs show the distribution of perceived VAT pass-through (left panel), the fraction of respondents which perceive a pass-through of equal to or larger than 1 percent (middle panel) and their average perceived pass-through (right panel) by being a bargain hunter or not from the January 2021 BOP-HH survey (Q12 in online Appendix B). We classify respondents as bargain hunters if they answer with the highest category on the intensity scale of Q14.

2, left panel). This identification approach avoids the need to ask survey respondents to form their own counterfactuals about their spending reaction to the VAT policy as in “How did you change your spending behavior due to the VAT policy?”

In addition, employing two surveys has the following advantages: First, it allows us to corroborate our main aggregate result that the temporary VAT cut stimulated durable consumption from two independent sources. At the same time, being able to ask different questions across surveys enables us to investigate a broader set of respondent heterogeneities and thus potential transmission channels. Second, with the GfK survey data, we gain access to the GfK scanner data on non-durable and semi-durable spending for the surveyed households.

We begin by estimating a regression with realized durable spending during the second half of 2020 (or rather its inverse hyperbolic sine transformation to account for zero or near-zero durable

spending) as the dependent variable.<sup>10</sup> The main regressor is a dummy variable which takes a value of zero when survey respondents state that they perceived a low degree of pass-through, and which takes a value of one when survey respondents perceived the pass-through to be high (see notes to Table 2 for details and Table A.4 in Appendix A for robustness to the econometric specification). Our argument is that consumers that do not believe that after-tax prices decreased as a result of the VAT cut have no motive to increase (durable) spending.

Revisiting the question of reverse causality, one might be worried that frequent and more price-sensitive shoppers are more likely to observe the actual pass-through and are therefore more likely to report a high perceived pass-through.<sup>11</sup> We, therefore, include an additional question in the January 2021 BOP-HH that asks households whether they would consider themselves “bargain hunters”, i.e., whether they usually are very attentive to prices and search for good deals. If the reason for the perceived pass-through of the VAT cut was merely heightened shopping activity, our identification would not be valid. However, the two right-hand-side panels of Figure 2 show that bargain hunters and non-bargain hunters have roughly the same level of perceived pass-through.<sup>12</sup>

Columns (1) and (2) of Table 2 present our estimates based on the BOP-HH (Panel A) and the GfK survey data (Panel B), both for regressions with just the dummy variable defined above plus a constant, and for regressions with household-specific controls (see table note). Households that perceived the VAT pass-through to be high report about 40 percent higher durable spending in the second half of 2020. The general order of magnitude of the estimates for the effect of the VAT policy is remarkably similar across the two surveys, with slightly more precise estimates for the GfK survey due to larger sample sizes.

We can use these numbers for a back-of-envelope calculation of the aggregate effects of the VAT policy on durable spending. Assuming, as is also the case in the GfK survey, that roughly

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<sup>10</sup>The inverse hyperbolic sine transformation of a variable  $x$  is defined as  $\log(x + \sqrt{x^2 + 1})$ . In particular, the inverse hyperbolic sine transformation of zero is zero. We also note that, away from zero, this transformation is close to the natural logarithm, which means that our estimates can be interpreted in percentage terms.

<sup>11</sup>Recall from the introduction that the literature has documented substantial pass-through of the VAT cut.

<sup>12</sup>Another issue with respect to identification might arise through the following mechanism: Respondents with high cognitive skills could be those that are at the same time more likely to engage in intertemporal optimization (substitution) and perceive a high pass-through as a result of being better informed about macroeconomic developments (D’Acunto, Hoang, Paloviita, and Weber, 2019). We note again that the empirical literature has found substantial pass-through. In the GfK survey, we asked households to place themselves on a scale from 0 to 10, with 0 representing an analytical approach to decision making and 10 representing an intuitive approach. Figure A.1 in Appendix A alleviates this concern: analytical respondents are hardly more likely to perceive a high pass-through, and their average perceived pass-through is the same as for intuitive respondents.

Table 2: Durable spending and beliefs about VAT pass-through, January 2021 surveys

A) BOP-HH, January 2021		Full Sample		Bargain Hunter		Net Wealth		Age	
Euro spending on durables in 2020HY2	w/o controls (1)	controls (2)	Yes (3)	No (4)	Low (5)	High (6)	Young (7)	Mid (8)	Old (9)
High perceived pass-through	0.418** (0.167)	0.553*** (0.210)	0.875*** (0.321)	0.238 (0.195)	0.710*** (0.245)	0.128 (0.265)	0.656** (0.322)	0.745** (0.306)	0.072 (0.254)
Constant	5.125*** (0.136)	6.055*** (0.670)	4.709*** (0.264)	5.288*** (0.157)	4.943*** (0.197)	5.489*** (0.222)	5.448*** (0.268)	5.258*** (0.249)	4.828*** (0.206)
Observations	2,242	1,401	637	1,605	911	981	550	668	982

B) GfK, January 2021		Full Sample		Price Sensitive		Public Servant		Financial Literacy		Planning in Advance	
Euro spending on durables in 2020HY2	w/o controls (1)	controls (2)	Yes (3)	No (4)	Yes (5)	No (6)	Yes (7)	Somewhat (8)	No (9)	Yes (10)	No (11)
High perceived pass-through	0.496*** (0.074)	0.357*** (0.082)	0.517*** (0.091)	0.277** (0.131)	0.589*** (0.167)	0.447*** (0.082)	0.278** (0.138)	0.554*** (0.116)	0.563*** (0.131)	0.452*** (0.101)	0.441*** (0.105)
Constant	4.835*** (0.060)	5.168*** (0.275)	4.691*** (0.073)	5.558*** (0.109)	5.183*** (0.140)	4.778*** (0.066)	5.160*** (0.114)	4.733*** (0.094)	4.731*** (0.104)	5.356*** (0.084)	4.385*** (0.083)
Observations	10,243	7,916	6,619	3,058	2,045	8,169	3,067	4,049	3,097	5,126	5,104

*Notes:* Results based on OLS regressions using data from the January 2021 waves of BOP-HH (Panel A) and GfK (Panel B). The left-hand-side spending data on durables have been transformed with the inverse hyperbolic sine transformation (Q13 in online Appendix B for the BOP-HH January 2021 and Q19 for the GfK). We code any answer with “perceived pass-through of < 1%” as 0, and  $\geq 1\%$  as 1 for BOP-HH (Q12); for GfK (Q18), we code any answer with “perceived pass-through of < 0%” as 0, and  $\geq 0\%$  as 1. For robustness checks where, respectively, we treat pass-through as a continuous variable and where we estimate Tobit instead of OLS regressions, see Table A.4 in Appendix A. Column (2) includes additional controls for gender, age, education, employment status, having children, the households’ income level and net wealth, as well as controls for the federal state and the municipality size the household lives in. We classify respondents as bargain hunters if they answer with the highest category on the intensity scale of Q14. Low/high cuts for “Net Wealth” (Q15) use the median as threshold. “Young” denotes below age 45, “Mid” between 45 and 60, and “Old” above 60. To gauge price sensitivity, we expose consumers to hypothetical price-change scenarios and then ask them about their overall consumption spending response (Q20). We then estimate for every consumer a substitution elasticity. We split the consumers according to the median substitution elasticity. “Public servant” is the result of a simple “yes or no” question (Q21). “Financial literacy” is self-reported on a scale between 0 (very financially literate) and 10 (no financial literacy) (Q22). “Yes” if score  $\geq 3$ , “Somewhat” if score  $\geq 3$  and  $< 6$ , “No” if score  $\geq 6$ . “Planning in Advance” is 0 if respondents state that they always decide “in the moment” (Q23). Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

two-thirds of Germans had a high perceived pass-through and taking 36% higher durable spending for that group as our preferred, estimate (see Panel B, column (2) of Table 2), we calculate that in 2020 durable spending was 21 billion Euros higher than it would have been without the VAT policy;<sup>13</sup> that is, it would have been 178 billion Euros instead of the actual 199 billion Euros of durable spending in 2020.<sup>14</sup>

As for heterogeneity, we find three results with the BOP-HH survey, documented in Table 2, columns (3) to (9) of Panel A. First, we confirm the result from the ex-ante approach that it is in particular young and middle aged households with low net wealth that increase their durable spending to the temporary VAT cut (see also Table A.5 in Appendix A for details). Second, focusing on a different dimension of heterogeneity, we show that the aggregate result is mainly driven by bargain hunters, i.e., households that self-report as being very attentive to prices and searching for good deals. Third, as Table A.5 shows, having low net wealth contributes to the aggregate positive effect on durable spending independently of whether the household is also a bargain hunter.

Investigating heterogeneity in the GfK survey, we find the following three results (see Table 2, columns (3) to (11) of Panel B). First, just as with the bargain hunters in the BOP-HH, more price-sensitive consumers show a stronger tendency to increase their durable spending in the second half of 2020.<sup>15</sup> Second, the reaction barely depends on whether a household member is employed as a public servant, which is a sign that pandemic-related income shocks—which should not affect public servants—are not especially relevant for our analysis. Third, the table shows that the stabilization success of the temporary VAT cut is not concentrated in households that are particularly financially literate or self-report a long planning horizon in making consumption-saving decisions. These results are consistent with our other finding that households of low net wealth appear to be particularly responsive to temporary VAT cuts.

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<sup>13</sup>To arrive at this number, we first calculate a no-VAT-policy-counterfactual semi-annual durable spending number for 2020 according to the following formula:  $\frac{\text{Actual durable spending in 2020}}{(1-0.65)*2+0.65*(2+effect)}$ , where 0.65 is the fraction of households that perceived a high pass-through and *effect* is our preferred micro estimate from Table 2, Panel B, column (2). This calculation assumes that households that did not perceive a high pass-through split their spending equally between the two half-years. Twice this number is our 178 billion Euros counterfactual estimate of durable spending in 2020.

<sup>14</sup>See Table 3.3.3, “langlebige Konsumgüter”, in *Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe 1.4*, from the German Federal Statistical Agency. Based on the BOP-HH number, Panel A, column (2) of Table 2, the aggregate effect of the VAT policy on durable spending would be 30 billion Euros.

<sup>15</sup>Whereas in the BOP-HH January 2021 wave we ask survey participants to self-identify whether they are price sensitive, that is, a bargain hunter, in the GfK January 2021 survey, we use a different but complementary strategy to measure their price sensitivity. We expose survey participants to hypothetical price-change scenarios and then ask them about their consumption spending response. We then estimate for every respondent a substitution elasticity. The regression in Table 2, Panel B, then splits the respondents according to the median substitution elasticity.

Table 3: Semi-durable and non-durable spending and beliefs about VAT cut pass-through, GfK scanner data

<b>Euro spending in 2020HY2</b>	Semi-durables		Non-durables	
	(1)	(2)	(3)	(4)
High perceived pass-through	0.131*** (0.035)	0.107*** (0.039)	0.047*** (0.010)	0.022** (0.011)
Constant	6.616*** (0.028)	6.689*** (0.139)	7.962*** (0.008)	8.047*** (0.034)
Controls	No	Yes	No	Yes
Observations	8,342	6,477	9,742	7,517

*Notes:* Results based on OLS regressions using GfK scanner data. The left-hand-side spending data on, respectively, semi-durables (columns 1-2) and non-durables (columns 3-4) have been transformed with the inverse hyperbolic sine transformation. We code any answer with “perceived pass-through of  $< 0\%$ ” as 0, and  $\geq 0\%$  as 1 for GfK (Q18 in online Appendix B). Controls include gender, age, education, employment status, having children, the households’ income level and net wealth, as well as controls for the federal state and the municipality size the household lives in. Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Using the same identification strategy as with durable spending, we conclude this section by exploiting the scanner data of the GfK and by re-estimating our baseline regression on semi-durable and non-durable spending.<sup>16</sup> We show in Table 3 that the stimulative effect of the temporary VAT cut increases in the durability, and thus the intertemporal substitutability, of the underlying consumption good. To be precise, semi- and non-durable spending is elevated for the high perceived pass-through households relative to their counterparts by 11% and 2%, respectively.<sup>17</sup>

<sup>16</sup>Examples for semi-durables in the GfK scanner data are books, cutlery, and car accessories; non-durables are essentially food items.

<sup>17</sup>Suppose that a household receives flow utility from nondurable consumption,  $C_t$ , and a stock of durable goods,  $D_t$ :  $U(C_t, D_t)$ . The flow utility function has standard properties, and the future is discounted by the factor  $0 < \beta < 1$ . The household receives a flow of real income each period,  $Y_t$ , and enters the period with a stock of nominal financial assets,  $A_t$ , which offer nominal gross return  $R_t$ . Let  $P_t$  denote the price of goods. The stock of durables depreciates at rate  $0 < \delta < 1$ . There is also a potentially time-varying consumption tax  $\tau_t$ . The flow budget constraint is then given by:  $A_{t+1} + (1 + \tau_t) * (P_t C_t + P_t (D_t - D_{t-1}) + \delta P_t D_{t-1}) \leq P_t Y_t + R_t A_t$ . Abstracting from uncertainty and denoting the gross inflation rate as  $\Pi_t \equiv P_t / P_{t-1}$ , the first-order conditions can be combined to yield:

$$\frac{U_D(C_t, D_t)}{U_C(C_t, D_t)} = \left( 1 - (1 - \delta) \frac{1 + \tau_{t+1} \Pi_{t+1}}{1 + \tau_t R_{t+1}} \right).$$

Under certain assumptions on preferences (for example, a log-log-specification), we have that an increase in the consumption tax must raise  $D_t/C_t$  (just as a decrease in the real interest rate). The effect of the VAT policy on  $D_t/C_t$  is the stronger the lower  $\delta$  is, i.e., the more durable  $D$  is. Put differently, durable consumption expenditures would be more consumption-tax sensitive than nondurables. Again, this is formally equivalent to sensitivity to the real interest rate. For structural VAR evidence on the latter, see Erceg and Levin (2006) and Monacelli (2009). See McKay and Wieland (2021a) for a model making a related point.



The intertemporal mechanics of the temporary VAT cut can be further seen in Figure A.2 in Appendix A, where we show the spending coefficient for respondents with a high perceived pass-through based on two-months rolling window regressions, both for semi-durables and non-durables in the GfK scanner data. The VAT policy effect is stronger for semi-durables than for non-durables for every point in time and it increases, in particular for semi-durables, towards the expiration date of the VAT cut, i.e., to the point right before the intertemporal price change (see McKay and Wieland, 2021b, who provide a model rationalizing this effect).

This finding is corroborated in a different survey. The German Federal Statistical Agency asked households for five out of the six months for which the temporary VAT cut lasted whether they would prepone or spend overall more on durable goods as a result of the temporary VAT cut. Bachmann, Bayer, and Kornejew (2021, Figure 19) shows that the fraction of households that answer affirmative for the preponing question—capturing intertemporal substitution—rises steadily from under 15% in August 2020 to almost 20% in December 2020.

Just as with durable spending, we can use our micro estimates for a back-of-envelope calculation of the aggregate effects of the VAT policy on semi-durable and non-durable spending. Using, respectively, the 11% and 2% effects (see columns (2) and (4) of Table 3), we calculate that in 2020 semi- and non-durable spending were 5 and 3 billion Euros higher than they would have been without the VAT policy.<sup>18</sup> If we further assume that spending on services was similarly affected by the VAT policy as spending on non-durables, its total effect amounts to 34 billion Euros (recall that the effect on durable spending was 21 billion Euros). Finally, comparing actual VAT revenues for the fiscal authorities in 2020 (see Table 3.4.3.16 of the *Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe 1.4*) with counterfactual VAT revenues based on the effective VAT rate in 2019 and the counterfactual no-VAT-policy total consumption spending from 2020, we calculate a fiscal revenue short-fall of 7 billion Euros.

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<sup>18</sup>See Table 3.3.3 in *Volkswirtschaftliche Gesamtrechnungen, Fachserie 18, Reihe 1.4*, from the German Federal Statistical Agency. We map “kurzlebige Konsumgüter” to semi-durables and “Verbrauchsgüter” to non-durables.

## 4 Conclusion

The unexpected, temporary VAT cut in Germany in the second half of 2020 worked as a measure of unconventional fiscal policy. We show that the policy stimulated spending on durables and, to a lesser extent, on semi-durable and on non-durable consumption goods. From a distributional perspective, the temporary VAT cut worked in a progressive way. Young, low net wealth households reacted the most. This reaction did not depend on measures of financial literacy and saving discipline. We do not take a stance on the optimality or even the appropriateness of this policy measure. We do show, however, that, as suggested by Correia, Farhi, Nicolini, and Teles (2013), an unexpected temporary VAT cut operates indeed like conventional monetary policy and can be an effective stabilization tool when the ELB binds and unconventional monetary policy like forward guidance might be less effective.

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## A Appendix: Additional Tables and Figures

Table A.1: Durable spending plans and knowledge about the VAT path—details, July 2020

Plans to buy durables 2020HY2 vs. typical second half-year	No controls (1)	Socio-economic controls (2)	Socio-economic and expectation controls (3)
Fully informed	0.098*** (0.033)	0.083*** (0.032)	0.077** (0.032)
Female		-0.006 (0.035)	0.012 (0.036)
Age: below 45		0.238*** (0.063)	0.239*** (0.064)
Age: 45-60		0.101* (0.056)	0.130** (0.058)
Education: Bachelor or above		0.076** (0.037)	0.073* (0.038)
Employed full time		0.101** (0.047)	0.091* (0.047)
Retired		0.117* (0.061)	0.095 (0.063)
Has children		-0.007 (0.035)	-0.010 (0.036)
Low income		-0.148*** (0.037)	-0.143*** (0.038)
Low net wealth		-0.147*** (0.036)	-0.128*** (0.037)
Low expected income			-0.103*** (0.034)
High expected inflation			0.015 (0.033)
Low expected unemployment			0.086* (0.050)
Low expected economic growth			-0.089** (0.037)
Expect low interest rate (saving)			-0.086 (0.076)
House price expectations, percent			-0.005*** (0.002)
COVID-19 restrictions will last, days			-0.000 (0.000)
Constant	-0.241*** (0.025)	-0.311*** (0.101)	-0.206* (0.117)
Observations	1,794	1,791	1,723

*Notes:* Results based on OLS regressions using data from the July 2020 wave of BOP-HH. We code the answer “more durable consumption spending than in a normal year” as +1, “same” as 0, and “less” as -1. Socio-economic controls also always include the federal state and municipality the household lives in (not shown for brevity reasons). “Inflation expectations” and “house price expectations” are based on quantitative core BOP-HH questions; the remaining expectations controls based on qualitative core BOP-HH questions (Q4–Q10 in online Appendix B). Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A.2: Durable spending plans and knowledge about VAT path—Covid-19 exposure, July 2020

<b>Plans to buy durables 2020HY2 vs. typ. sec. half-year</b>	All (1)	COVID-19 cases, low (2)	COVID-19 cases, high (3)
Fully informed	0.098*** (0.033)	0.096** (0.046)	0.099** (0.046)
Constant	-0.241*** (0.025)	-0.233*** (0.035)	-0.249*** (0.035)
Observations	1,794	902	892

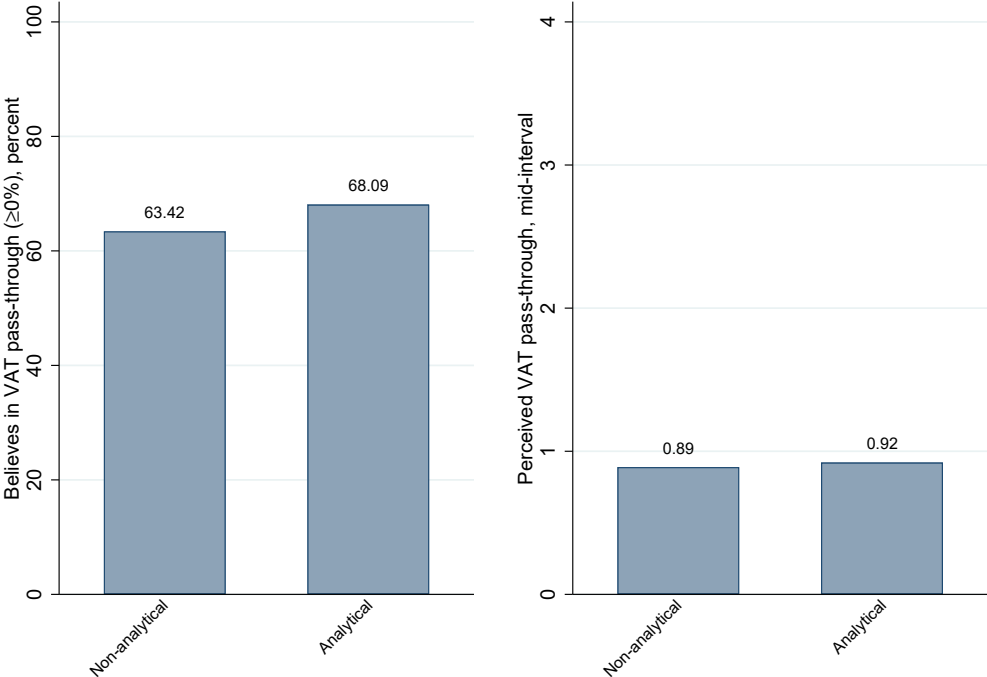
*Notes:* Results based on OLS regressions using data from the July 2020 wave of BOP-HH (no additional controls). We code the answer “more durable consumption spending than in a normal year” as +1, “same” as 0, and “less” as -1. Low/high cut uses the median as threshold. “COVID-19 cases” are the cumulated cases from the beginning of the pandemic until July 12, 2020, at the county (Kreis) level per 100K population. The data is merged to the BOP data through a county identifier (Kreiskennziffer). Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A.3: Durable spending plans and knowledge about the VAT path—two-dimensional splits, July 2020

	All	Young			Mid			Old		
		Net Wealth								
		Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)			
<b>Plans to buy durables</b>										
<b>2020HY2 vs. typical</b>										
<b>second half-year</b>										
Fully informed	0.098*** (0.033)	0.269*** (0.085)	-0.014 (0.103)	0.139* (0.083)	0.042 (0.074)	0.057 (0.076)	0.054 (0.064)			
Constant	-0.241*** (0.025)	-0.262*** (0.061)	0.024 (0.073)	-0.417*** (0.061)	-0.094 (0.059)	-0.453*** (0.055)	-0.196*** (0.051)			
Observations	1,794	275	186	264	334	267	458			
<b>Plans to buy durables</b>										
<b>2020HY2 vs. typical</b>										
<b>second half-year</b>										
Fully informed	0.098*** (0.033)	0.159 (0.099)	0.095 (0.089)	0.293*** (0.074)	-0.121 (0.083)	0.085 (0.086)	0.081 (0.062)			
Constant	-0.241*** (0.025)	-0.269*** (0.066)	-0.010 (0.067)	-0.453*** (0.054)	-0.008 (0.065)	-0.343*** (0.066)	-0.287*** (0.048)			
Observations	1,794	204	253	313	280	253	455			

*Notes:* Results based on OLS regressions using data from the July 2020 wave of BOP-HH (no additional controls). We code the answer “more durable consumption spending than in a normal year” as +1, “same” as 0, and “less” as -1. “Net Wealth” based on Q4 in online Appendix B. “Expected Income Change” is twelve-months ahead (Q5). Low/high cuts always use the median of the corresponding variable as threshold. Thresholds for the splits are based on the one dimensional marginal distributions. Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Figure A.1: The ex-post approach. Identification: perceived pass-through and analyticalness



Notes: Graphs show the fraction of respondents which perceive a pass-through of equal to or larger than 0 percent (left panel) and their average perceived pass-through (right panel) by level of self-reported analyticalness from the GfK survey (Q22 in online Appendix B). Scale between 0 (analytical) and 10 (intuitive). Analytic=1 if score < 5 and Analytic=0 if score  $\geq 5$ .



Table A.4: Durable spending and beliefs about VAT pass-through—additional results, January 2021

Euro spending on durables in 2020HY2	BOP-HH				GfK survey				Tobit (12)			
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	Tobit (5)	Tobit (6)	OLS (7)	OLS (8)		OLS (9)	OLS (10)	Tobit (11)
High perceived pass-through	0.418** (0.167)	0.553*** (0.210)	0.159** (0.069)	0.199** (0.087)	0.555** (0.233)	0.674** (0.273)	0.496*** (0.074)	0.357*** (0.082)	0.138*** (0.024)	0.088*** (0.027)	0.662*** (0.105)	0.470*** (0.114)
Pass-through percent												
Female		-0.702*** (0.229)		-0.710*** (0.229)		-0.959*** (0.295)		-0.122 (0.085)		-0.121 (0.085)		-0.182 (0.116)
Age: below 45		-0.109 (0.397)		-0.094 (0.397)		-0.137 (0.509)		-0.076 (0.138)		-0.081 (0.138)		-0.023 (0.188)
Age: 45-60		0.007 (0.362)		0.016 (0.362)		-0.006 (0.459)		-0.182 (0.113)		-0.186 (0.113)		-0.215 (0.157)
Education: Bachelor or above		-0.056 (0.221)		-0.044 (0.221)		-0.068 (0.283)		0.032 (0.091)		0.042 (0.091)		0.035 (0.122)
Employed full time		0.326 (0.296)		0.311 (0.297)		0.380 (0.385)		0.535*** (0.196)		0.534*** (0.197)		0.774*** (0.290)
Retired		-0.298 (0.387)		-0.305 (0.389)		-0.407 (0.495)		0.417** (0.209)		0.414** (0.209)		0.601* (0.307)
Has children		0.514** (0.257)		0.520** (0.257)		0.650* (0.344)		0.530*** (0.120)		0.526*** (0.120)		0.697*** (0.160)
Low income		-0.957*** (0.235)		-0.958*** (0.236)		-1.195*** (0.316)		-0.665*** (0.088)		-0.666 (0.088)		-0.823*** (0.120)
Low net wealth		0.277 (0.217)		0.268 (0.217)		0.396 (0.287)		-0.505*** (0.083)		-0.515*** (0.083)		-0.634*** (0.114)
Constant	5.125*** (0.136)	6.055*** (0.670)	5.167*** (0.127)	6.106*** (0.671)	4.237*** (0.191)	5.621*** (0.906)	4.835*** (0.060)	5.168*** (0.275)	4.962*** (0.049)	5.283*** (0.272)	3.952*** (0.093)	4.307*** (0.394)
Observations	2,242	1,401	2,242	1,401	2,242	1,401	10,243	7,916	10,243	7,916	10,243	7,916

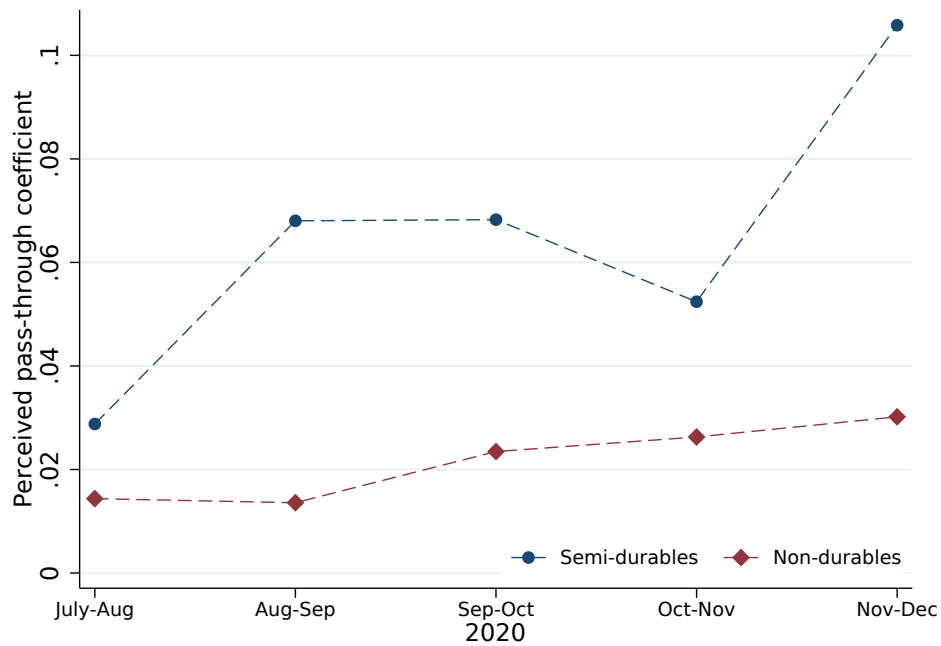
Notes: Results based on OLS or Tobit regressions using data from the January 2021 waves of BOP-HH and GfK survey. The left-hand-side spending data on durables have been transformed with the inverse hyperbolic sine transformation. In columns (1), (2), (5), and (6), we code any answer with “perceived pass-through of < 1%” as 0, and  $\geq 1\%$  as 1; in columns (7), (8), (11), and (12), we code any answer with “perceived pass-through of < 0%” as 0, and  $\geq 0\%$  as 1; in columns (3), (4), (9), and (10), we use the perceived pass-through as a continuous variable. Socio-economic controls also always include the federal state and municipality the household lives in (not shown for brevity reasons). Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A.5: Durable spending and beliefs about VAT pass-through—two-dimensional splits, January 2021

Euro spending on durables in 2020HY2	Net Wealth															
	All					Bargain Hunter					Age					
	Low	High	Low	High	All	Low	High	Young	Mid	Old	Low	High	Young	Mid	Old	
	Yes (1)	Yes (2)	No (3)	No (4)	Yes (5)	Yes (6)	Young (7)	Young (8)	Mid (9)	Old (10)						
High perceived pass-through	0.418** (0.167)	1.057** (0.432)	0.186 (0.577)	0.521* (0.297)	0.109 (0.300)	0.913** (0.412)	0.011 (0.600)	1.089** (0.437)	0.559 (0.510)	-0.078 (0.420)	0.058 (0.369)					
Constant	5.125*** (0.136)	4.650*** (0.337)	5.488*** (0.498)	5.109*** (0.242)	5.489*** (0.248)	5.443*** (0.351)	5.741*** (0.483)	4.962*** (0.351)	5.782*** (0.436)	4.576*** (0.328)	5.102*** (0.311)					
Observations	2,242	297	236	614	745	302	174	285	270	309	522					

*Notes:* Results based on OLS regressions using data from the January 2021 waves of BOP-HH (no additional controls). The left-hand-side spending data on durables have been transformed with the inverse hyperbolic sine transformation. We code any answer with “perceived pass-through of < 1%” as 0, and  $\geq$  1% as 1. We classify respondents as bargain hunters if they answer with the highest category on the intensity scale of Q14. Low/high cuts for “Net Wealth” (Q15) use the median as threshold. “Young” denotes below age 45, “Mid” between age 45 and 60, and “Old” above 60. Thresholds for the splits are based on the one dimensional marginal distributions. Robust standard errors (in parentheses). Significance levels, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Figure A.2: Time path of spending response



*Notes:* Results based on OLS regressions using GfK scanner data. The OLS regressions have been pooled over two-month windows. The left-hand-side spending data on, respectively, semi-durables and non-durables have been transformed with the inverse hyperbolic sine transformation. We code any answer with “perceived pass-through of  $< 0\%$ ” as 0, and  $\geq 0\%$  as 1 in the GfK data. Controls include gender, age, education, employment status, having children, the households’ income level and net wealth, as well as controls for the federal state and the municipality size the household lives in.

## B Appendix: Survey Questions

This appendix provides the exact wording in the German original of the questions we use to construct the variables for our empirical analysis.

### Bundesbank Online Panel of Households – July 2020

The following questions are used for the ex-ante analysis. The full questionnaires can be found at the website of the Deutsche Bundesbank.<sup>19</sup> In brackets, we list the original survey numbers of the questions.

**Q1 Informed about VAT change [Question 716]:** Hatten Sie bereits vor dieser Umfrage etwas von den Aktivitäten der Bundesregierung gehört oder gelesen? Bitte wählen Sie die alle zutreffenden Antworten aus.

- Der Änderung der Mehrwertsteuer
- Der Senkung der Mehrwertsteuer zum 1. Juli 2020
- Der Erhöhung der Mehrwertsteuer zum 1. Januar 2021
- Die Übernahme der EU Ratspräsidentschaft durch Deutschland im Jahr 2020
- Keine der genannten Aktivitäten

*Only if items 2 and 3 were both selected, are the respondents considered to be fully informed.*

**Q2 Plans to buy durable goods in the second half of the year 2020, compared to a typical second half-year [Question 705]:** Sie sehen nun einige Dinge, für die man im Alltag Geld ausgeben kann oder muss. Bitte geben Sie jeweils an, ob Sie planen, von Juli bis Ende Dezember 2020 für die folgenden Dinge voraussichtlich mehr oder weniger auszugeben als üblicherweise in der zweiten Jahreshälfte, etwa von Juli bis Dezember 2019? Wie ist es mit größeren Anschaffungen (z.B. Auto, Möbel, elektrische Geräte usw.)?

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<sup>19</sup><https://www.bundesbank.de/en/bundesbank/research/survey-on-consumer-expectations/survey-on-consumer-expectations-794568>.

*The answer possibilities were given as follows:*

1. Plane mehr auszugeben
2. Plane in etwa gleich viel auszugeben
3. Plane weniger auszugeben

**Q3 Reasons for increased spending plans [Question 718A]:** Sie haben angegeben, dass Sie planen von Juli bis Ende Dezember 2020 voraussichtlich für gewisse Dinge mehr auszugeben als üblicherweise im zweiten Halbjahr, wie etwa in der zweiten Jahreshälfte 2019. Könnten Sie uns bitte mitteilen, wie sehr die folgenden Gründe für Ihre geplanten Mehrausgaben zutreffen bzw. nicht zutreffen? Wie ist es mit ...

- Nachholbedarf
- Wegen bereits eingetretener oder erwarteter Einkommenserhöhungen
- Das war sowieso geplant
- Wegen bereits eingetretener oder erwarteter Werterhöhung meiner Finanzanlagen
- Ich erwarte Preissenkungen in diesem Zeitraum
- Wegen der Mehrwertsteueränderung
- Wegen des Kinderbonus
- Weil ich erwarte, dass die Preise ab Januar 2021 steigen werden

*The following answer possibilities were given:*

1. trifft voll und ganz zu
2. trifft eher zu
3. trifft eher nicht zu
4. trifft ganz und gar nicht zu

To study potential heterogeneity patterns in the ex-ante analysis, we use the responses to the following survey questions:

**Q4 Net wealth [Question 712]:** Wie hoch schätzen Sie das gesamte Vermögen (netto) Ihres Haushalts ein? Das Gesamtvermögen (netto) ist der Wert all dessen, was den Haushaltsmitgliedern gehört abzüglich aller Schulden und Verbindlichkeiten.

- Unter 0 €
- 0 bis unter 2.500 €
- 2.500 bis unter 5.000 €
- 5.000 bis unter 10.000 €
- 10.000 bis unter 25.000 €
- 25.000 bis unter 50.000 €
- 50.000 bis unter 75.000 €
- 75.000 bis unter 100.000 €
- 100.000 bis unter 250.000 €
- 250.000 bis unter 500.000 €
- mehr als 500.000 €

**Q5 Expected income change [Question 709]:** Für wie wahrscheinlich halten Sie es, dass sich das durchschnittliche monatliche Nettoeinkommen Ihres Haushaltes in den kommenden 12 Monaten wie folgt entwickelt?

Hinweis: Bei dieser Frage geht es darum, wie Sie die Wahrscheinlichkeit einschätzen, dass ein bestimmter Sachverhalt in der Zukunft eintritt. Ihre Antworten können in einer Spanne zwischen 0 und 100 liegen, wobei 0 absolut unwahrscheinlich bedeutet und 100 absolut sicher. Mit Werten dazwischen können Sie Ihre Einschätzung abstufen. Bitte beachten Sie, dass sich die Angaben über alle Kategorien auf 100 summieren müssen.

- um 2000 Euro oder mehr sinkt
- um 1500 Euro bis unter 2000 Euro sinkt
- um 1000 Euro bis unter 1500 Euro sinkt
- um 500 Euro bis unter 1000 Euro sinkt

- um 250 Euro bis unter 500 Euro sinkt
- um 0 Euro bis unter 250 Euro sinkt
- um 0 Euro bis unter 250 Euro steigt
- um 250 Euro bis unter 500 Euro steigt
- um 500 Euro bis unter 1000 Euro steigt
- um 1000 Euro bis unter 1500 Euro steigt
- um 1500 Euro bis unter 2000 Euro steigt
- um 2000 Euro oder mehr steigt

**Q6 Expected inflation [Question 005B]:** Was denken Sie, wie hoch wird die Inflationsrate / Deflationsrate in den kommenden zwölf Monaten in etwa sein?

Hinweis: Inflation ist der prozentuale Anstieg des allgemeinen Preisniveaus. Sie wird meist über den Verbraucherpreisindex gemessen. Ein Rückgang des Preisniveaus wird gemeinhin als „Deflation“ bezeichnet. Bitte tippen Sie einen Wert in das Zahlenfeld ein (eine Nachkommastelle möglich).

\_\_\_\_\_ Prozent

Additionally, as controls in our regression analysis, we include variables based on the following questions.

**Q7 Monthly household net income [Question hhinc]:** Wie hoch ist das monatliche Nettoeinkommen Ihres Haushaltes insgesamt?

*Hinweis:* Damit ist die Summe gemeint, die sich ergibt aus Lohn, Gehalt, Einkommen aus selbständiger Tätigkeit, Rente oder Pension, jeweils nach Abzug der Steuern und Sozialversicherungsbeiträge. Rechnen Sie bitte auch die Einkünfte aus öffentlichen Beihilfen, Einkommen aus Vermietung, Verpachtung, Wohngeld, Kindergeld und sonstige Einkünfte hinzu.

- unter 500 EUR
- 500 bis 999 EUR
- 1.000 bis 1.499 EUR
- 1.500 bis 1.999 EUR

- 2.000 bis 2.499 EUR
- 2.500 bis 2.999 EUR
- 3.000 bis 3.499 EUR
- 3.500 bis 3.999 EUR
- 4.000 bis 4.999 EUR
- 5.000 bis 5.999 EUR
- 6.000 bis 7.999 EUR
- 8.000 bis 9.999 EUR
- 10.000 EUR und mehr

**Q8 Macroeconomic expectations [Question 004]:** Nun geht es um Ihre Einschätzung zur allgemeinen wirtschaftlichen Entwicklung in Deutschland in den kommenden zwölf Monaten. Was glauben Sie, wie werden sich die folgenden Größen in den kommenden zwölf Monaten entwickeln? Werden/wird...

- die Arbeitslosenquote in Deutschland
- die Zinsen auf Sparkonten
- das Wirtschaftswachstum in Deutschland

*With the following answer possibilities:*

1. deutlich sinken
2. geringfügig sinken
3. ungefähr gleich bleiben
4. geringfügig steigen
5. deutlich steigen

**Q9 House price expectations [Question 701]:** Was denken Sie, um wie viel Prozent werden sich die Immobilienpreise in Ihrer Umgebung in den kommenden 12 Monaten verändern?



Hinweis: Bitte tippen Sie einen Wert in das Zahlenfeld ein (eine Nachkommastelle möglich). Benutzen Sie hierfür bitte einen Punkt statt eines Kommas. Im Falle von angenommenen sinkenden Immobilienpreisen geben Sie bitte einen negativen Wert ein.

\_\_\_\_\_ Prozent

**Q10 Duration of Covid restrictions [Question 711]:** Was denken Sie, wie lange werden die Corona-Pandemie-bedingten Einschränkungen bei Veranstaltungen und Zusammenkünften dauern? Noch ...

Hinweis: Bitte tragen Sie die Zahl ein, die Sie für am wahrscheinlichsten halten. Sie können die Angabe entweder in Tagen, Wochen oder Monaten machen. Bitte entscheiden Sie sich für eines der drei Felder.

1. Tage \_\_\_\_\_
2. Wochen \_\_\_\_\_
3. Monate \_\_\_\_\_

Finally, we use the following question for data cleaning purposes:

**Q11 Spending and spending plans non-durable [Question 704A]:** Wie viel geben Sie in etwa durchschnittlich pro Monat für Konsumgüter des täglichen Bedarfs (Lebensmittel, Bekleidung, Freizeitaktivitäten inklusive Restaurantbesuche, Benzin und ähnliches) aus bzw. planen Sie auszugeben? Hinweis: Bitte tippen Sie in jedes Feld einen Beitrag ein. Wenn Sie es nicht genau wissen, schätzen Sie bitte.

- a) üblicherweise gebe ich pro Monat in der zweiten Jahreshälfte (Juli bis Ende Dezember) aus \_\_\_\_\_ Euro
- b) in der zweiten Jahreshälfte 2020 (Juli bis Ende Dezember) plane ich pro Monat auszugeben \_\_\_\_\_ Euro

## Bundesbank Online Panel of Households – January 2021

The BOP-HH January 2021 wave is used in our ex-post analysis. The full questionnaires can be found at the website of the Deutsche Bundesbank.<sup>20</sup>

**Q12 VAT pass-through [Question P1306]:** Was glauben Sie, wie hat die vorübergehende Mehrwertsteuersenkung die Preise zwischen dem 1. Juli 2020 und dem 31. Dezember 2020 beeinflusst?

- Die Preise sind um mehr als 3% gesunken.
- Die Preise sind zwischen 2% und 3% gesunken.
- Die Preise sind zwischen 1% und 2% gesunken.
- Die Preise sind um weniger als 1% gesunken.
- Die Preise sind gleichgeblieben.
- Die Preise sind gestiegen.

**Q13 Spending durables [Question P1304]:** Wie viel haben Sie für größere Anschaffungen (z.B. Auto, Möbel, elektrische Geräte usw.) ausgegeben?

Hinweis: Bitte tippen Sie in jedes Feld einen Beitrag ein. Wenn Sie es nicht genau wissen, schätzen Sie bitte.

- In der zweiten Jahreshälfte 2020 (Juli bis Ende Dezember 2020) habe ich tatsächlich ausgegeben: \_\_\_\_\_ Euro

To study potential heterogeneity patterns in the ex-ante analysis, we use the responses to the following survey questions:

**Q14 Bargain Hunting [P1305]:** Inwieweit treffen die folgenden Aussagen auf Sie zu oder nicht zu?

- Üblicherweise bin ich eine Person, die (Sonder-)Angebote sucht und auf die Preise achtet.

*The following answer possibilities were given:*

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<sup>20</sup><https://www.bundesbank.de/en/bundesbank/research/survey-on-consumer-expectations/survey-on-consumer-expectations-794568>.

1. trifft voll und ganz zu
2. trifft eher zu
3. trifft eher nicht zu
4. trifft ganz und gar nicht zu

Q15 **Gross wealth and liabilities [Question CQ007]**: Wie hoch schätzen Sie das gesamte Vermögen und die Verbindlichkeiten Ihres Haushalts ein?

Infobox: “Zum Vermögen gehören Immobilien, Fahrzeuge, Beteiligungen an Unternehmen, Finanzanlagen sowie Guthaben bei Versicherungen. Die Verbindlichkeiten umfassen Hypothekenschulden, Konsumentenkredite, überzogene Girokonten und andere Schulden oder Verbindlichkeiten.”

– Gesamtvermögen (brutto)

1. 0 bis unter 2.500 €
2. 2.500 bis unter 5.000 €
3. bis unter 25.000 €
4. 5.000 bis unter 10.000 €
5. 10.000 bis unter 25.000 €
6. 25.000 bis unter 50.000 €
7. 50.000 bis unter 75.000 €
8. 75.000 bis unter 100.000 €
9. 100.000 bis unter 250.000 €
10. 250.000 bis unter 500.000 €
11. 500.000 € und mehr

– Ausstehender Betrag besicherter Kredite (Hypothekenkredite)

1. 0 (kein Kredit)
2. Schulden in Höhe von 1 bis unter 25.000 €
3. 25.000 bis unter 50.000 €
4. 50.000 bis unter 100.000 €
5. 100.000 bis unter 150.000 €

6. 150.000 bis unter 200.000 €
  7. 200.000 bis unter 300.000 €
  8. 300.000 bis unter 500.000 €
  9. 500.000 € und mehr
- Ausstehender Betrag unbesicherter Kredite (bspw. Dispokredite, Konsumentenkredite, Kredite zur Finanzierung eines Unternehmens, oder einer beruflichen Tätigkeit, von Fahrzeugen, Haushaltseinrichtung, Urlaub oder Bildung, Kredite von Freunden und Verwandten).
1. 0 (kein Kredit)
  2. Schulden in Höhe von 1 bis unter 1.000 €
  3. 1.000 bis unter 2.000 €
  4. 2.000 bis unter 5.000 €
  5. 5.000 bis unter 10.000 €
  6. 10.000 bis unter 20.000 €
  7. 20.000 bis unter 40.000 €
  8. 40.000 € und mehr

Additionally, as control in our regression analysis, we include a variable based on the following question:

**Q16 Monthly household net income [Question CS008]:** Wie hoch ist das monatliche Nettoeinkommen Ihres Haushaltes insgesamt?

*Hinweis:* Damit ist die Summe gemeint, die sich ergibt aus Lohn, Gehalt, Einkommen aus selbständiger Tätigkeit, Rente oder Pension, jeweils nach Abzug der Steuern und Sozialversicherungsbeiträge. Rechnen Sie bitte auch die Einkünfte aus öffentlichen Beihilfen, Einkommen aus Vermietung, Verpachtung, Wohngeld, Kindergeld und sonstige Einkünfte hinzu.

1. unter 500 EUR
2. 500 bis 999 EUR
3. 1.000 bis 1.499 EUR

4. 1.500 bis 1.999 EUR
5. 2.000 bis 2.499 EUR
6. 2.500 bis 2.999 EUR
7. 3.000 bis 3.499 EUR
8. 3.500 bis 3.999 EUR
9. 4.000 bis 4.999 EUR
10. 5.000 bis 5.999 EUR
11. 6.000 bis 7.999 EUR
12. 8.000 bis 9.999 EUR
13. 10.000 EUR und mehr

Finally, we use the following question for data cleaning purposes:

**Q17 Past monthly expenditures [Question CQ004]:** Wenn Sie einmal an den letzten Monat denken: Wieviel Euro haben Sie im letzten Monat in etwa für die folgenden Dinge jeweils ausgegeben?

- Artikel des täglichen Bedarfs (z.B. Lebens- und Genussmittel, Non-Food-Artikel wie Reinigungsmittel o.Ä.)
- Bekleidung und Schuhe
- Freizeitaktivitäten (z.B. Restaurantbesuch, Kulturveranstaltung, Fitnessstudio)
- Mobilität (z.B. Kraftstoff, Fahrzeugkredite und laufende Kosten, Bus- und Bahn-Tickets)

### **GfK Homescanner Panel Survey – January 2021**

The GfK Homescanner Panel Survey survey, January 2021 wave, is used in our ex-post analysis.

**Q18 VAT pass-through [Question 7]:** Was glauben Sie: Wie hat die zeitweise Mehrwertsteuersenkung im Jahr 2020 die Preisentwicklung von Waren und Dienstleistungen insgesamt ab dem 01. Juli 2020 bis 31. Dezember 2020 beeinflusst?

- Die Preise sind um mehr als 3% gesunken.

- Die Preise sind um 3% gesunken.
- Die Preise sind um 2% bis 3% gesunken.
- Die Preise sind um weniger als 2% gesunken.
- Die Preise sind gleichgeblieben.
- Die Preise sind gestiegen.

**Q19 Spending durables [Question 5c]:** Wie viel haben Sie in etwa für größere Anschaffungen (z.B. Auto, Möbel, elektrische Geräte usw.) ausgegeben?

Hinweis: Bitte tippen Sie in jedes Feld einen Beitrag ein. Wenn Sie es nicht genau wissen, schätzen Sie bitte.

- In der zweiten Jahreshälfte 2020 (Juli bis Ende Dezember 2020) habe ich tatsächlich ausgegeben: \_\_\_\_\_ Euro

**Q20 Price Sensitivity [Question 16]:** Bitte denken Sie an alle Ausgaben Ihres Haushalts.

Damit gemeint sind u. a. Ausgaben für Lebensmittel, Drogerieartikel, Wohnkosten (z.B. Miete, Hypothek), Zuzahlungen für ärztliche Behandlungen / Medikamente, Mobilität, Freizeit sowie große Anschaffungen. Wir möchten nun von Ihnen wissen, ob Sie MEHR oder WENIGER ausgeben würden, wenn die Verbraucherpreise insgesamt steigen oder sinken würden.

Bitte geben Sie entweder in der Spalte „steigen um“ oder in der Spalte „sinken um“ an, um wie viel Prozent Ihre Haushaltsausgaben Ihrer Einschätzung nach steigen oder sinken würden oder aber kreuzen Sie in der Mitte an, wenn Sie denken, dass Ihre Ausgaben unverändert bleiben würden. Bitte machen Sie eine Angabe pro Zeile.

Meine Haushaltsausgaben würden...

- steigen um \_\_\_\_\_ %.
- unverändert bleiben.
- sinken um \_\_\_\_\_ %.

*Respondents were presented with the following scenarios:*

1. Die Preise steigen um 10%

2. Die Preise steigen um 3%
3. Die Preise steigen um 1%
4. Die Preise sinken um 1%
5. Die Preise sinken um 3%

To study potential heterogeneity patterns in the ex-ante analysis, we use the responses to the following survey questions:

**Q21 Public Servant [Question 12]:** Sind Sie, Ihr(e) Partner(in) oder ein anderes Haushaltsmitglied als Angestellte(r) oder als Beamte(r) im öffentlichen Dienst tätig?

Hinweis: Bitte alles Zutreffende angeben.

- Ja, ich bin im öffentlichen Dienst tätig
- Ja, mein(e) Partner(in) / anderes Haushaltsmitglied ist im öffentlichen Dienst tätig
- Nein

**Q22 Skills [Question 10]:** Im Folgenden sehen Sie einige Aussagen als Gegensatzpaare. Bitte geben Sie pro Zeile jeweils an, ob Sie eher der linken Aussage oder eher der rechten Aussage zustimmen. Verwenden Sie dazu bitte die Zahlen von „0“ bis „10“: „0“ bedeutet, dass Sie der linken Aussage voll und ganz zustimmen, und „10“ bedeutet, dass Sie der rechten Aussage voll und ganz zustimmen.

– **Analytical:**

Ich bin ein analytischer Mensch. 0\_\_\_\_\_ 1\_\_\_\_\_ 2\_\_\_\_\_ 3\_\_\_\_\_ 4\_\_\_\_\_ 5\_\_\_\_\_ 6\_\_\_\_\_ 7\_\_\_\_\_ 8\_\_\_\_\_ 9\_\_\_\_\_ 10\_\_\_\_\_ Ich handle eher intuitiv.

– **Financial literacy:**

Ich kenne mich mit Finanzen / Finanzmathematik sehr gut aus. 0\_\_\_\_\_ 1\_\_\_\_\_ 2\_\_\_\_\_ 3\_\_\_\_\_ 4\_\_\_\_\_ 5\_\_\_\_\_ 6\_\_\_\_\_ 7\_\_\_\_\_ 8\_\_\_\_\_ 9\_\_\_\_\_ 10\_\_\_\_\_ Ich kenne mich mit Finanzen / Finanzmathematik überhaupt nicht aus.

**Q23 Planning in advance [Question 14]:** Wenn Sie entscheiden, wie viel Sie ausgeben bzw. sparen werden, wie weit planen Sie dann normalerweise in die Zukunft?

1. Ich plane nicht im Voraus, sondern entscheide immer für die aktuelle Situation.
2. Ich plane im Voraus.

Additionally, as control in our regression analysis, we include a variable based on the following question:

**Q24 Net wealth [Question 20]:** Wie hoch schätzen Sie das gesamte Vermögen (netto) Ihres Haushalts ein? Das Gesamtvermögen (netto) ist der Wert all dessen, was den Haushaltsmitgliedern gehört abzüglich aller Schulden und Verbindlichkeiten?

- Unter 0 €
- 0 bis unter 2.500 €
- 2.500 bis unter 5.000 €
- 5.000 bis unter 10.000 €
- 10.000 bis unter 25.000 €
- 25.000 bis unter 50.000 €
- 50.000 bis unter 75.000 €
- 75.000 bis unter 100.000 €
- 100.000 bis unter 250.000 €
- 250.000 bis unter 500.000 €
- Mehr als 500.000 €
- Ich möchte diese Frage nicht beantworten

Finally, we use the following question for data cleaning purposes:

**Q25 Past monthly expenditures [Question 4b]:** Bitte denken Sie an die monatlichen Ausgaben für Konsumgüter des täglichen Bedarfs in Ihrem Haushalt (Lebensmittel, Bekleidung, Freizeitaktivitäten inklusive Restaurantbesuche, Benzin und ähnliches) und ergänzen Sie die folgende Aussage. In der zweiten Jahreshälfte 2020 (Juli bis Ende Dezember 2020) habe ich pro Monat durchschnittlich tatsächlich ausgegeben: \_\_\_\_\_ Euro.

*Hinweis:* Bitte tragen Sie in jedes Feld einen Betrag ein und runden Sie bitte auf ganze Euro. Wenn Sie es nicht genau wissen, schätzen Sie bitte.