HOW COSTLY ARE BUSINESS CYCLE VOLATILITY AND INFLATION?

A *VOX POPULI* APPROACH

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Abstract: Using surveys of households across thirteen countries, we study how much individuals would be willing to pay to eliminate business cycles. These direct estimates are much higher than traditional measures following Lucas (2003): on average, households would be prepared to sacrifice around 5-6% of their lifetime consumption to eliminate business cycle fluctuations. A similar result holds for inflation: to bring inflation to their desired rate, individuals would be willing to sacrifice around 5% of their consumption. Willingness to pay to eliminate business cycles and inflation is generally higher for those whose consumption is more pro-cyclical, those who are more uncertain about the economic outlook, and those who live in countries with greater historical volatility.

JEL: E3, E4, E5
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"*The question I have addressed in this lecture is whether stabilization policies … promise important increases in welfare. The answer to this question is "No": The potential gains from improved stabilization policies are on the order of hundredths of a percent of consumption.*" Lucas (2003)

"*How much would you pay to avoid a second Depression? I mean, this is a pretty good return on investment.*" Ben Bernanke (2009)

I. Introduction

Lucas (1987) famously argued that consumers would be willing to reduce their lifetime consumption by only about one-twentieth of one percent to eliminate all business cycle fluctuations. Subsequent work considered a wide range of departures from the stylized setup initially assumed by Lucas, such as incomplete markets (Imrohoroglu 1989, Atkeson and Phelan 1994), different utility functions (Tallarini 2000), or links between volatility and growth (Ramey and Ramey 1991, Barlevy 2003). Reviewing the advances following his original estimates, Lucas (2003) came to the conclusion that business cycles were even *less* costly than he had originally thought: households should only be willing to sacrifice on the order of *hundredths* of one percent of their consumption. Notably, he emphasized that this range is an order of magnitude smaller than the welfare benefit of reducing inflation by 10 percentage points.

Using a series of large, nationally-representative household surveys fielded in May-June 2024 across thirteen advanced economies, we provide the first *direct* estimates of consumers' self-reported willingness to pay (WTP) to eliminate business cycle risk as well as their willingness to pay to bring inflation to their ideal level. Our results are in sharp contrast to those proposed by Lucas (2003): on average, consumers are willing to permanently reduce their consumption by 6% to eradicate macroeconomic volatility. This is the same order of magnitude as what households report they would be willing to sacrifice to bring inflation to their desired level, sacrificing around 5% of their consumption to reduce inflation by 7 percentage points on average. When expressed in terms of increases in unemployment or declines in GDP growth, the implied sacrifice ratio to reduce inflation is approximately 0.5.

Willingness to pay to eliminate business cycles and to reduce inflation are strongly positively correlated across individuals and are systematically related to individual characteristics in the ways theory would predict. For example, individuals who are more uncertain about their future consumption are willing to pay more to reduce business cycles, as are those with more cyclical earnings (since they are more exposed to business cycle risk). We also find that greater uncertainty

about the macroeconomic outlook (e.g. uncertainty about GDP growth) raises people's WTP to reduce macroeconomic volatility, even after we control for their individual consumption uncertainty. This result indicates that people seem to care about business cycle volatility above and beyond its implications for their own consumption, which could capture several features not included in the baseline Lucas calculation such as volatility in leisure time or altruistic motives. Furthermore, when we use the information treatments as a source of exogenous variation in the WTP about business cycle volatility, we find a positive causal effect running from WTP about business cycles to WTP for inflation reductions that is about half the OLS estimate. Thus, consumers view a connection between business cycle volatility and the level of inflation that runs in both directions. Because standard models do not imply a tight connection between business cycle volatility and the level of inflation, this suggests another dimension in which people's WTP for macroeconomic stability differs from the predictions of typical macroeconomic models.

Our analysis has several steps. First, we ran comparable surveys in the USA, Korea, and the eleven largest euro area countries: Austria, Belgium, Germany, Greece, Spain, Finland, France, Ireland, Italy, Netherlands, and Portugal. Each survey first gathered socioeconomic information about households. Subsequently, respondents were asked to report their expectations for macroeconomic variables (inflation, growth rate of GDP) and their personal situations (e.g., growth rate of consumer spending). These forecasts are generally for the one-year-ahead horizon but for some countries we also have longer-run forecasts. Importantly, we elicited subjective probability distributions to measure first (mean) and second (uncertainty) moments of the respective expectations following the question format of the New York Fed Survey of Consumer Expectations (see e.g. Crump et al. 2022). We generally find that micro- and macroeconomic uncertainty are strongly related.

Then we asked households to answer a few questions that measure their risk aversion and their exposure to macroeconomic fluctuations. The former are lottery questions in the spirit of Barsky et al. (1997) and Falk et al. (2018). The latter ask respondents to report how their consumer spending, earnings and financial wealth would change in response to a hypothetical change in the growth rate of GDP. These hypothetical questions have been successfully applied in recent economics research (e.g., Andre et al. 2022 and Bruschi et al. 2025). We find large cross-sectional variation in the sensitivity to business cycles.

Finally, we asked respondents to answer a series of hypothetical questions that aim to measure their willingness to pay to achieve various macroeconomic outcomes. Specifically, this part

presented respondents with objective facts about macroeconomic fluctuations and asked them how much they would reduce their consumer spending to eliminate this volatility. Because survey responses may be sensitive to the framing of the questions, random subsets of respondents were presented with different formulations of the question ranging from reporting uncertainty in professional short-term macroeconomic forecasts to presenting time series of unemployment rates and GDP growth rates over the last 30 years. We find that information about historical business-cycle variation in the unemployment rate and the GDP growth rate results in somewhat higher WTP but the magnitudes are broadly similar across the various formulations of the question.

We used a similar approach for inflation with two important modifications. First, to elicit the inflation rate that respondents perceive as ideal, we asked them to report their preferred rate of inflation over the next three years. Across all countries, we consistently observe that, on average, households want to have deflation (≈2%), consistent with the notion that people want the price level to return to the pre-COVID19 trend. On average, their desired rates of inflation are 7 percentage points lower than their inflation forecasts. Thus, the high WTP for inflation partly reflects the large distance between the desired and predicted inflation rates. Second, we measure WTP in terms of not only acceptable reductions in consumption but also reductions in macroeconomic growth and increased unemployment. The latter sheds light on the public's perceptions about the sacrifice ratio, that is, how much e.g., extra unemployment can be tolerated to reduce the rate of inflation by one percentage point. We find that the sacrifice ratio is approximately 0.5 for the unemployment rate and for the output growth rate, which is also remarkably similar to the evidence in Pfajfar and Winkler (2024) who find a sacrifice ratio of 0.6 for the U.S.

To validate our results, we relate reported WTPs to respondents' macroeconomic experiences and characteristics. For example, we find that WTP for macroeconomic stability is generally increasing in historical macroeconomic volatility: respondents in crisis-scarred countries like Korea and Greece report an average WTP of around 8% and 6% of consumption, respectively, whereas those in Belgium and the Netherlands are only willing to sacrifice 3-4% of consumption. In a similar spirit, WTP for reduced inflation is higher for countries that experienced high inflation in the past. We also document that respondent characteristics are systematically associated with WTP. For instance, respondents who report greater exposure to business cycles have higher WTP. While these regressions are not causal, the fact that estimated coefficients are broadly in line with theoretical predictions supports the validity of self-reported WTP measures. Furthermore, we use

the Shapley decomposition for R^2 to have a better sense of what factors predict WTP. We find that economic expectations and exposure to business cycles are some of the strongest predictors of WTP.

Our work contributes to several strands of research. First, we add to the enormous literature on the cost of business cycles and inflation (see Imrohoroglu 2008 and Driffill et al. 1990 for summaries). Our main innovation is to elicit beliefs about the costs of business cycles rather than rely on models to infer the cost. This step is important because previous work largely builds on the full-information rational expectations—an assumption that is at odds with the growing body of evidence (e.g., Coibion, Gorodnichenko and Kamdar 2018 and Weber et al. 2022)—while we do not put restrictions on perceptions and expectations. Our estimates suggest that households perceive the cost of business cycles as very large. These estimates are consistent with evidence in labor economics documenting large earnings losses in recession (e.g., Davis and von Wachter 2011) and high willingness to avoid recessions or job separations (e.g., Davis and Krolikowski 2025, Borgschulte and Martorell 2018), as well as macroeconomic models that deliver high costs of business cycles (e.g. Barlevy 2003, Constantinides 2021). At the same time, we find that the sacrifice ratio acceptable to households is much lower than sacrifice ratios implied by macroeconomic time series.

Second, we contribute to the literature on using surveys to measure macroeconomic preferences, narratives, etc. Early work used subjective measures of well-being from surveys to assess how business cycles and inflation affected welfare (e.g. Shiller 1998, Wolfers 2003). This approach yielded the conclusion that business cycles were strongly correlated with subjective well-being. We build on this work by utilizing *quantitative* measures of conditional changes in well-being from removing either business cycles or inflation. In closely related studies, Stantcheva (2024), Binetti et al. (2024), Pfajfar et al. (2024), Afrouzi et al. (2024), Guerreiro et al. (2024) and others focus on understanding why people dislike inflation and what rate of inflation they prefer to have. Relative to these studies, we provide a quantitative metric for measuring perceived costs of both business cycles and inflation, with a cross-country perspective.

Third, economists have long used the concept of WTP to answer many important questions and to direct policy. Indeed, topics covered by WTP analyses range from green electricity (Roe et al. 2001) to a toupee (McEvoy, Morgan, and Whitehead 2019). Our innovation is to bring WTP tools to macroeconomic contexts and thus provide policymakers with a sense of what the public is willing to pay to achieve a desired macroeconomic outcome.

The rest of the paper is structured as follows. Section 2 describes the surveys used across the different countries. Section 3 focuses on how we measure certain key potential determinants of the WTP, such as economic expectations, risk tolerance, and exposure to business cycle volatility. Section 4 presents the results on WTP to eliminate business cycles while section 5 does the same for WTP to bring inflation to desired levels. Section 6 discusses the correlation between the two. Section 7 concludes.

II. Data

We rely on three sources of survey data. The two surveys that cover Europe and the U.S. have been used extensively before, while the survey for Korea is novel to the profession. Hence, we provide only brief reviews of the former and give more details for the latter. While designing the surveys, we tried to harmonize them as much as possible to ensure that cross-country variation is not driven by differences in survey design. The median duration of the surveys varied across sources (~10 minutes in Europe, ~15 minutes in the U.S., and ~30 minutes in Korea) and thus the amount of elicited information is different which we use occasionally to shed more light on mechanisms and channels, but we generally utilize the intersection of the elicited information for cross-country analyses.

A. ECB CES

The Consumer Expectations Survey (CES) of the European Central Bank (ECB) is a monthly online panel of households in the eleven largest euro area countries. The survey is nationally representative (survey weights are used to correct for possible imbalances) and has a target size of ~19,000 households. To deal with sample attrition, the panel is refreshed with new recruits every month and respondents can stay in the panel for up 24 months. While being recruited to participate in the panel, each respondent completes a background questionnaire that elicits information about family situation, education, financial literacy, etc. The monthly surveys focus on more time-sensitive information such as employment status, income, spending, etc. as well as expectations about the aggregate economy (e.g., inflation expectations) and personal circumstances (e.g., probability of losing a job). Georgarakos and Kenny (2022) and ECB (2021) provide a detailed description of the survey. Importantly, the CES allows occasional ad hoc modules (approximately 10 minutes of survey time) which are added after the main survey (see e.g., Coibion et al. 2024). We used this important feature to field questions about households' preferences for macroeconomic stability and the rate of inflation. The data were collected in June 2024.

B. Nielsen Homescan Panel

Our data for the U.S. are based on a survey of 60,000-80,000 households participating in the Nielsen Homescan Panel. Panelists annually provide extensive information about their circumstances to Nielsen, a marketing company. Although the main objective of the panel is to measure consumer behavior of U.S. households, Nielsen allows researchers and corporate clients to run surveys of panelists to complement data on household-level purchases. The panelists are invited (but not required) to participate in a survey and earn points which can be used later for purchases. A typical response rate is 20-25% and the resulting sample size is usually between 15,000 and 25,000 respondents. Nielsen provides weights to make samples nationally representative. D'Acunto et al. (2021) and Coibion, Gorodnichenko and Weber (2022) contain detailed descriptions of the data and survey. The wave dedicated to measuring macroeconomic preferences was fielded in June 2024. We obtained 13,460 responses (response rate 19.2%).

C. Embrain

Our data on Korean households are based on a survey of individuals participating in the Macromill Embrain Panel. Similar to the Nielsen Homescan Panel in the U.S., the Macromill Embrain Panel is a consumer panel maintained by Macromill Embrain (hereafter referred to as Embrain), one of the leading online survey firms in South Korea. Embrain allows clients to conduct surveys of panelists for research or marketing purposes. Panelists are invited to participate in online questionnaires and earn points that can be converted into Korean Won. Embrain attempts to balance the panel on age, gender and regions.

We collected the data of 5,000 anonymized individuals in June 2024. The response rate for our survey was 13.7%, while a typical response rate is around 15% to 25%. Appendix Table 1 summarizes the demographic and socioeconomic characteristics of the sample, alongside national averages shown in column 3. For instance, the average age of respondents is 40, and the average household after-tax income is 77,246k KRW per year[1] for an average household size of 2.8. Approximately 82% of respondents are employed and 61% of respondents own houses.

While the sample is fairly representative of the national population in terms of age, gender, region, and homeownership, it is more educated, more employed, and has a higher income than the national average. Notably, the large standard deviations for most demographic variables highlight

[1] Based on the exchange rate at the time of the survey (June 2024), this is approximately equivalent to US$55,000/year.

the significant heterogeneity within the sample. This makes the data suitable for exploring the relationship between perceived micro and macro expectations and uncertainty, as well as sensitivity of personal spending, income, and wealth to movements in GDP.

III. Measurement

We now discuss the main survey questions for our analysis. We report the US questionnaire in the online appendix. A key innovation of our study is the homogeneous elicitation of preferences, beliefs, and WTP across a large set of countries that span three continents.

A. Risk aversion

Following Falk et al. (2018), we use a series of hypothetical lotteries to elicit a measure of risk aversion. Specifically, respondents choose between a certain payment and a hypothetical lottery where the respondent can win \$300 (or an equivalent amount in local currency) with a 50% chance or 0 otherwise. The first pair of options offers \$150 as the certain payment and then depending on the choice the amount is decreased (if a certain payment is chosen) or increased (if a lottery is chosen). The respondents face five lottery questions so that the certain amount can range from \$10 to \$320. Table 1 reports the average certain payment by country. Consistent with earlier studies, we find that the share of risk averse respondents is high (~90% in our sample) but large heterogeneity is present. By construction, our lottery questions cannot yield implied risk aversion greater than 1.[2] Hence, we focus on the ranking of respondents in terms of their risk tolerance, which we define as the certain payment (divided by 10) accepted by a respondent.

B. Micro- and Macroeconomic Expectations

Because WTP to avoid business cycles likely depends on how uncertain individuals' subjective economic outlook is, we elicit not only the first moments of economic expectations (e.g., point predictions) but also the second moment of the expectations. Specifically, we present respondents with a fixed set of scenarios and ask them to assign probabilities to the scenarios. For example, the wording of the question for the future growth rate of household spending is given by:

[2] Assuming CRRA utility $u(x) = \frac{x^{1-\sigma}-1}{1-\sigma}$, one can infer $\sigma = 1 - \frac{\log(2)}{\log(\$300)-\log(y)}$, where y is the certain payment in the 5th lottery. By construction $\sigma < 1$ as long as $y < \$300$.

Think about your monthly household spending now compared to your household spending in one year. What do you think is the percent chance that, ***over the next 12 months****…*

Percent chance

My household spending will ***increase*** *by 12% or more*
My household spending will ***increase*** *by 8% or more, but less than 12%*
My household spending will ***increase*** *by 4% or more, but less than 8%*
My household spending will ***increase*** *by 2% or more, but less than 4%*
My household spending will ***increase*** *by 0% or more, but less than 2%*
*My household spending will d****ecrease*** *by more than 0%, but less than 2%*
*My household spending will d****ecrease*** *by 2% or more, but less than 4%*
*My household spending will d****ecrease*** *by 4% or more, but less than 8%*
*My household spending will d****ecrease*** *by 8% or more, but less than 12%*
*My household spending will d****ecrease*** *by 12% or more*

% Total *[TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]*

We ask similar questions for the growth rate of GDP and for the inflation rate at the one-year-ahead horizon. Table 2 and Figure 1 report the basic properties of subjective expectations. The magnitudes are broadly similar across countries, but large cross-sectional heterogeneity is present. The considerable consumption uncertainty that we elicit via this probabilistic type of question is consistent with earlier research that uses, instead, a simpler alternative asking respondents about their min and the max expected spending in a typical month (see Christelis et al. 2020). Panels D-F document that uncertainty at the micro- and macroeconomic levels are highly correlated ($\rho \approx 0.8$). The first moments exhibit more complex relationships. Inflation and consumer spending tend to be positively correlated whereas inflation and GDP growth rate tend to be negatively correlated. This pattern is consistent with households believing that more inflation results in more (nominal) consumer spending just to maintain a given consumption basket but at the same time associating high inflation (roughly more than 4%) with a bad state of the economy (see also Kamdar 2018, Candia et al. 2020). The relationship between consumer spending and GDP growth rate is U-shaped. This pattern suggests that some purchases could be countercyclical for some households (e.g., cars are cheaper during economic downturns which can stimulate purchases for some households). Taken together, these descriptives suggest that households perceive high uncertainty about economic prospects more broadly and their future spending in particular, making it instructive to examine their willingness to eliminate such uncertainty.

C. Exposure to Business Cycles

While previous studies are often constrained to rely on indirect measures of exposure to business cycles (e.g., industry of employment, presence of a mortgage), we use the flexibility of the surveys to elicit exposure using hypothetical questions. For example, we gauge the sensitivity of consumer spending to macroeconomic conditions with the following question:

> *We would like to know how much you think your household **spending** varies with how well the economy does in the future.*
>
> *Suppose that **the economy** <**RANDOM DRAW**> percent in 2025 relative to 2024. By how much would you expect your household **spending** to change?*
>
> ***The annual spending of my household would change by <RESPONSE> % in 2025 relative to the annual spending in 2024.***

where **<RANDOM DRAW>** takes values $\{shrink\ by,\ grow\ by\}\times\{2\%,4\%,6\%\}$. The variation in hypothetical values of GDP growth is orthogonal to respondents' observed (and unobserved) characteristics and aims to capture potential non-linearities and asymmetries in the sensitivity to aggregate fluctuations. We compute the sensitivity as $\frac{\text{<RESPONSE>}}{\text{<RANDOM DRAW>}}$, that is, percent change in consumer spending per one percent change in the growth rate of GDP. We ask similar questions about earnings and the value of financial assets.

The average perceived sensitivity to GDP is 0.48 for consumer spending, 0.41 for earnings, and 0.47 for the value of financial assets (Table 3). However, large variation exists across and within countries with some respondents reporting negative values (Panel A, Figure 2). Across countries, for example, we see an average consumption sensitivity to GDP ranging from 0.8 in Korea and 0.7 in the US down to 0.02 in Germany and 0.05 in Austria.[3] Importantly, the sensitivity of consumer spending is positively correlated with the sensitivity of earnings and financial wealth, which points to only imperfect and limited consumption insurance of households (Panel B, Figure 2).[4] Country averages for consumption sensitivity are positively associated with the correlation between consumption growth and GDP growth in the aggregate data, that is, the sensitivity tends to be higher in countries where consumption growth is more correlated with GDP growth. We also observe that the sensitivity to changes in GDP varies by the size and direction of the change (Panel C, Figure 2). Specifically, responses to decreases in the GDP growth rate tend to be smaller than

[3] The low average sensitivity for households in Germany and Austria is consistent with low average homeownership and stock market participation rates and hence negligible consumption wealth effects of stock market and housing wealth.
[4] If consumption insurance were perfect, there should be no correlation between consumer spending with earnings or financial wealth.

responses to increases in the GDP growth rate, which is consistent with more limited sensitivity to negative shocks. This pattern is particularly clear for consumer spending. Larger changes tend to generate smaller responses per one percent change in the GDP growth rate which points to concavity in the absolute magnitude of the response. To capture these variations in the sensitivity, our regressions control for the scenario presented to a respondent.

IV. Willingness to pay: Business cycles

Consumers' consumption, earnings, and financial income are exposed to fluctuations in aggregate income and a positive correlation exists between the sensitivity of consumer spending on GDP growth and the sensitivity of income and financial earnings, documenting a departure from perfect consumption insurance. Hence, consumers might be willing to forego parts of their consumption to smooth out fluctuations in GDP. How strong this motive is, however, remains unclear, with estimates ranging from the lows of Lucas (2003) to nearly 10% of consumption in Barlevy (2003).

A. Measurement

Because prior work has not explored how to ask consumers about their willingness to pay to avoid macroeconomic risks, we considered five different ways of doing so, each of which included some type of information about business cycle volatility (Table 4). Survey respondents were randomly assigned to the different formulations.

Version A presented respondents with a measure of short-term macroeconomic uncertainty and then asked them to report by how much they would be willing to reduce their spending in 2025 to eliminate the uncertainty and have the historical average of the growth rate with certainty for the year 2025. This short-term focus can therefore give us a proxy for the "marginal cost of business cycles" in the sense of Alvarez and Jermann (2004). For Korea and the U.S., short-term macroeconomic uncertainty was represented by the min-max range in the one-year-ahead professional forecasts for the growth rate of GDP in the respondent's country.[5] In the CES survey, respondents were told the maximum variation that had occurred in that country over the last 30 years.[6]

Version B used the same structure and treatments as version A, but asked respondents to indicate how much consumption they would be willing to sacrifice *per year* to have stable growth

[5] This type of information was used in Coibion et al. (2024) to convey macroeconomic uncertainty to households.
[6] As we show in Table 6, using the maximum deviation across cycles or a normal one makes little difference to reported WTP, so the effect of this difference within the treatment should be fairly benign. We report specific values of information treatments in Appendix Table 5.

at the historical average for the entire period of 2025-2029. The main difference from Version A is therefore that we extended the horizon over which stable growth is delivered, and the WTP is measured per year rather than for a specific calendar year.

Version C presented respondents with two pieces of information about the growth rate of GDP and the unemployment rate. The first piece was the historical average of each. The second piece reported *average* increases (trough-to-peak) and decreases (peak-to-through) for each variable over the last 30 years of data. In other words, we provided respondents with stylized facts about business cycles in their country and then asked to report how much spending they would be willing to give up per year to ensure a stable macroeconomy.

Version D followed a very similar structure as Version C, but instead of presenting average changes over the business cycle, it provided the *maximum* variation over the business cycle. This version aims to measure WTP to avoid catastrophic events such as the Great Recession, the COVID-19 crisis or the 1997 Asian financial crisis, in the spirit of the motivating quote from Ben Bernanke. In other words, we would like to differentiate WTP for "garden variety" business cycles and WTP for economic disasters. The possibility of rare disasters has been found to generate potentially much larger welfare costs of business cycles (Barro 2009).

Version E presents respondents with the time series of the unemployment rate and the GDP growth rate over the last 30 years. This version is potentially important because the mode of information intervention (text, picture, video, etc.) may be important for how people process information (Ash et al. 2024). In addition, we do not know which moments are more important or salient for respondents. One can think of versions C-E as proxying the "total cost" of business cycles in the sense of Alvarez and Jermann (2004).

When designing these questions, we aimed to balance the pros and cons of eliciting WTP by a direct survey. For example, hypothetical WTP can exceed real (revealed) WTP because "talk" could be cheap. While real WTP would of course be preferred, assessing real WTP requires a finished, sellable version of the product, something which is not possible in our context. Careful meta-studies comparing hypothetical and real WTP for public (e.g., Carlson et al. 1996, Murphy et al. 2005) and private (e.g., Schmidt and Bijmolt 2020) goods when both measures are available suggest that hypothetical WTP on average overstates real WTP by 20-30%, but for many cases these measures are closely aligned and highly correlated. Carlson et al. (1996) document that hypothetical WTP overstated real WTP by a factor of 2 or more only in 3% of the studies. Thus,

even if direct surveys may overstate WTP, we can still gauge the order of magnitude and de-bias survey-based WTPs to obtain more accurate estimates. These meta-studies also suggest that alternative indirect approaches (e.g., inferring WTP from varying attributes against a given benchmark) can overstate rather than understate WTP. Furthermore, a direct survey offers a cost-effective way (relative to e.g., indirect approaches) to elicit WTP when survey time is limited, which is important in our context.

B. Descriptive statistics and validation

Figure 3 visualizes the distribution of WTP to avoid business cycles while Table 5 reports moments for WTP. These data are pooled across the different versions of the survey question. We truncate the sample at the top 5% to reduce the influence of outliers. Several facts stand out.

First, the average WTP to pay is quite high: on average, respondents would reduce their consumer spending by 5.7% to eradicate macroeconomic volatility. This number is two orders of magnitude larger than the amount suggested by the Lucas (2003) calculation. Although some variation in WTP across countries is present (e.g., 3.4% in the Netherlands and 7.8% in Korea), WTP is high even in stable economies. While the distribution has a thick right tail, the median WTP is similar to the mean. Even if we discount these WTPs by a third to correct for possible biases in direct elicitation of WTP, the resulting WTP still points to a large perceived cost of business cycles (~4% of consumption on average).

Second, a dramatic cross-sectional variation in WTP is present: the standard deviation is 5%. Only 10% of respondents report zero WTP. On the other hand, roughly 10% indicate that they are willing to sacrifice more than 10% of their consumer spending to eliminate business cycles. We will explore predictors of this variation below.

Third, roughly 45% of reported WTPs come in multiplies of 5 and the modal response is 5%. As discussed in Binder (2017), lumping of responses at round numbers like 5 or 10 signals uncertainty on the part of survey participants about their responses. This result should not come as a surprise: thinking about the value of eliminating business cycle fluctuations is not something people think about regularly, so putting a specific number on it in a survey is cognitively demanding. However, the respondents are free to choose zero, yet the vast majority of them choose positive responses. In other words, households reject the null of zero cost of business cycles by a large margin, although they may be uncertain about the precise magnitude.

Fourth, reported WTP depends on how we elicit the WTP. When we regress WTP on indicator variables for each version of the question (Table 6), we find that WTP is lower by more than one percentage point for Versions A and B. That is, households are willing to reduce their consumption by less when macroeconomic volatility is conveyed by disagreement (uncertainty) in short-term forecasts, but the difference between the "marginal" and "total" costs of business cycles is not as large as suggested by Alvarez and Jermann (2004) and others. As we move from average business-cycle variation (Version C) to maximal business cycle variation (Version D) to representing the time series (Version E), WTP increases. These results suggest that households may have limited information about business cycles, which is consistent with previous studies documenting that households change their beliefs and actions in response to publicly available information such as past inflation or the central bank's inflation target (e.g., Coibion, Gorodnichenko, and Weber 2022), and that households have an imperfect recall about past macroeconomic developments (e.g., Salle, Gorodnichenko and Coibion 2023). This pattern is also consistent with our earlier observation that the survey participants may be uncertain in their views on business cycles, and thus information provided in the questions can sway their responses. In light of this sensitivity to the wording of the question, we will control for the wording whenever appropriate. When we run separate estimates for the USA and Korea vs. the euro area, we find few qualitative differences.

Fifth, although survey responses can be noisy, one can relate the responses to macroeconomic fundamentals. For example, Panel A of Figure 4 shows that households have higher WTP in countries that have experienced more macroeconomic volatility over the last 30 years or during the COVID19 crisis. Panel B of the figure documents that households who are more uncertain about the growth rate of GDP or their personal consumption have higher WTP. These patterns are qualitatively consistent with the Lucas (2003) calculations where $WTP = \frac{1}{2}\gamma\sigma_c^2$, γ is the coefficient of relative risk aversion and σ_c^2 is historical or forward-looking uncertainty (variance) about consumption growth. However, this simple formula does not seem to describe the variation in WTP quantitatively. Specifically, the relationship appears to be linear in the standard deviation rather than the variance. Furthermore, if we interpret the relationship in Panel B of Figure 4 as a linear approximation of $\frac{1}{2}\gamma\sigma_c^2$, the implied estimate of γ (the slope of the relationship) would be on the order of 30. This magnitude would be consistent with the estimates based on variation in asset prices (e.g., Tallarini

2000) but survey evidence points to $\gamma \approx 4$ (e.g., Barsky et al. 1997). Finally, Panel C of Figure 4 shows that WTP is increasing in the exposure to business cycles.

C. Predictors of cross-sectional variation in WTP

To gain further insights, we regress WTP on respondents' beliefs and characteristics and report results in Table 7. To make our estimates less sensitive to influential observations and outliers, we use Huber (1964) robust regressions. To be clear, these estimates should be interpreted as correlations (rather than causal effects). To structure our discussion, we group variables into several blocks, but a variable can of course belong to multiple categories.

We start with the variables that describe first and second moments of beliefs about personal consumption growth and GDP growth ("economic outlook"). We find that higher uncertainty about growth rates of both personal spending and GDP are positively associated with WTP to avoid business cycles. As we discussed above, these measures are highly correlated and yet they appear to be distinct predictors of WTP with similar predictive strength. If the Lucas (2003) approximation was a perfect description of how WTP is determined, only uncertainty about future consumption growth would have predictive power for the WTP to avoid business cycles, conditional on risk aversion. The fact that uncertainty about GDP also raises WTP suggests that other factors beyond an individuals' consumption volatility are relevant. Examples of such factors could include cyclical variation in leisure time or altruistic motives such that individuals value the welfare of others and how business cycles affect society beyond their own condition. The first moments are also positively correlated with WTP even though economic theory does not make unambiguous predictions about this correlation.

The second set of variables ("risk preferences") is the polynomial in the amount chosen by the respondents in the hypothetical lottery question, which captures the risk tolerance of respondents. The estimated coefficients suggest an inverted-U relationship with the peak at approximately $100 chosen as a certain payment. This pattern contrasts with a monotonic negative relationship predicted by theory, that is, respondents who choose smaller certain payments should be more risk averse and hence have a higher WTP. However, particularly risk-averse respondents may take actions (e.g., select into recession-proof occupations such professors, doctors, etc.) to reduce their losses from macroeconomic volatility. As a result, these respondents may have lower WTP because they have already partially insured themselves. In principle, we control for exposure

to business cycles through other variables, but if we cannot control for all sources of variation in exposure, this mechanism could remain a confounder in interpreting how risk aversion affects WTP.

To control for differential exposure to business cycles, we condition on the absolute value of the sensitivity that households reported for their consumption, income and financial assets to changes in GDP. We find that respondents with spending, earnings and financial wealth that are more sensitive to changes in GDP tend to have higher WTP to reduce macroeconomic volatility. Those who have a higher probability of losing a job in the next 12 months also have a higher WTP too. These results are broadly consistent with theoretical predictions. The employed and retired tend to have lower WTP relative to those who are unemployed or out of labor force. While neither the employed (who may lose their jobs) nor retirees (whose financial wealth may vary with macroeconomic conditions) are insulated from the business cycles, these groups likely have more resources to weather a recession which may lead to a lower WTP.

The next group of variables aims to capture the wealth and income of respondents ("wealth"). We measure access to liquid financial wealth with an indicator variable equal to one if the respondent can cover unexpected expenditures equal to one monthly income. Because the main asset for many respondents is their house, we create indictor variables for various housing situations (own without a mortgage, own with a mortgage, rent, and other situations for dwelling). Finally, we use log household income as part of this bloc. We find that respondents with lower incomes and binding liquidity constraints have lower WTP, consistent with their reduced ability to pay for any kind of additional spending.

The final bloc consists of demographic variables. We observe that male respondents tend to report lower WTP which is in line with men's overconfidence and greater willingness to take risks (e.g., Barber and Odean 2001, Charness and Gneezy 2012). WTP has an inverted-U profile in age with a peak at roughly 50 years. Respondents with children have higher WTP which is consistent with risk tolerance of parents decreasing with the arrival of children (e.g., Görlitz and Tamm 2020). Using race and ethnicity data for the USA, we find that African American and Asian Americans tend to have higher WTP. College and post-college graduates have higher WTP, which as with income, could reflect their ability to more easily finance new spending relative to those with less education.

To assess the relative contribution of these groups of variables, we use Shapley (1953) to decompose R^2 so that we can attribute the predictive power to each block of variables (column (1)

of Table 8).[7] Country fixed effects account for ~22% of the explained variation which flags the importance of macroeconomic (e.g., history of crises), institutional (e.g., the generosity of social safety net) and cultural (e.g., strength of intra-family support) factors. How information about business cycles is communicated to respondents accounts for ~26%. This result suggests that public discourse on the importance of macroeconomic stabilization may need to be framed in the context of specific facts about business cycle volatiliy. The fact that 22% is attributed to the economic outlook indicates that short-term beliefs about micro- and macroeconomic dynamics considerably color perceptions of how costly business cycles are. Exposure to business cycles plays a large role too (~14.4%) which is consistent with earlier work (e.g., Krusell et al. 2009) emphasizing heterogeneous business cycle costs depending on how much various groups of households can smooth out macroeconomic shocks. Other blocks of variables have more modest contributions. For example, the share attributed to wealth and income stands at 4.8% of the estimated R^2. The ranking of the blocks of variables is preserved when we do not include country fixed effects (column (2) of Table 8).

D. Summary

Together, these results indicate that consumers' willingness to pay to eliminate business cycles is quite high. Even if we discount for the fact that surveys of WTP seem to overstate values by up to a third, this would still produce an average WTP of around 4% of consumption. Variation across countries is broadly consistent with their historical volatility, while the cross-sectional variation across individuals is largely in line with theory: WTP is higher for those who perceive more volatility and who are more exposed to macroeconomic volatility, among other factors. However, uncertainty in individuals' responses about their WTP appears to be high, as indicated by the large fraction of rounded answers and the fact that what they answer is sensitive to the information about the business cycle that we provide. Nonetheless, the key take-away is that consumers appear prepared to give up far more consumption to avoid business cycles than what many traditional models would imply. Instead, our estimates are more in line with models considered in Barlevy (2003), Barro (2009) or Braxton and Sledz (2024) which predict much larger costs of business cycles. These results are also

[7] With correlated regressors, there is no unique way to decompose the contribution or compute marginal R^2. For example, marginal R^2 can be sensitive to the order in which variables are included in the regression. Shapley's (1953) classic approach is not sensitive to the ordering and has a number of other desirable properties. In a nutshell, Shapley's approach is to calculate average marginal R^2s across all possible combinations of regressor blocs.

qualitatively consistent with Coibion et al. (2024) that implement an RCT to move households' first and second moment expectations about GDP growth. Given the high prevailing uncertainty at the time, the information provision in the RCT reduced the uncertainty of many treated respondents, which in turn increased considerably their actual spending in subsequent months.

V. Willingness to pay: Inflation

One way that Lucas (2003) tried to compare his estimates of consumers' WTP to eliminate business cycles was relative to what models would predict individuals should be prepared to pay to reduce inflation by 10 percentage points, concluding that the latter should result in WTP of an order of magnitude larger than for business cycles. Indeed, in typical macroeconomics models used for business cycle analysis and monetary policy, welfare losses primarily stem from inflation, which results in a misallocation of resources and price signals becoming less informative. Empirically, it has often been documented that consumers have a strong direct dislike for inflation (Shiller, 1998, Stantcheva, 2024, Binetti et al., 2024, Pfajfar et al., 2024, Afrouzi et al., 2024, Guerreiro et al., 2024), and historical experience suggests that inflation surges even have the potential power to sway election outcomes. Yet, whether this dislike for inflation is an order of magnitude larger than dislike of business cycle volatility, as suggested by Lucas (2003), remains untested. In this section, we provide the first direct estimates of consumers' willingness to pay to reduce inflation that we know of.

A. Measurement

Because some individuals may gain from higher inflation while others may gain from lower inflation, we measure WTP for each individual in terms of what they would be willing to sacrifice to bring inflation to their *own* desired level. This approach is conceptually different from the Lucas calculation of the cost of bringing inflation from e.g., 10% to 0% for everyone, which may benefit some and harm others. Relative to Lucas, our approach likely provides an upper bound on what the gains from changing inflation would be.

To do so, we therefore first need to elicit respondents' desired rate of inflation. To this end, we asked survey participants to use a slider (from -10% to +10%) to report the desired inflation rate for their household over the medium run:

> *Please think about **the next three years**. Which **change** in the general level of prices of goods and services (per year) would be the most beneficial for your household?*

For comparison, Pfajfar and Winkler (2024) ask about optimal inflation for the U.S. economy over the next 12 months, whereas Afrouzi et al. (2024) ask U.S. households about inflation rate in "a typical year" for the goods and services in "the economy you live in".

We then asked respondents to tell us how much consumption they would be willing to sacrifice to achieve their reported desired inflation rate:

> *In the first part of the survey, you predicted that prices of goods and services would change by <YYY>% over the next 12 months.*
>
> *Suppose that you could bring the **change** in the general level of prices for goods and services **over the next 12 months** to your preferred rate of <PPP>% per year by reducing your consumption over the next 12 months by a certain percentage. By how much would you be willing to reduce your consumption to achieve this outcome?*
>
> *I would be willing to reduce my consumption over the next 12 months by __% to change the rate of change in the general level of goods and services from < YYY>% over the next 12 months to my preferred rate of <PPP>% per year.*

This question is only asked for households whose inflation forecast differs from their desired inflation rate, but in practice we ask this question to almost everyone.

Because previous work has typically studied the cost of inflation in terms of increased unemployment or lower growth rate of output (i.e., the sacrifice ratio), we also asked two additional questions to elicit these costs as well. For example, the question about unemployment was as follows:

> *Suppose reducing the **change** in the general level of prices for goods and services from your forecast of <YYY>% to your preferred rate of <PPP>% per year would lead to an **increase in unemployment** over the next 12 months.*
>
> *What maximum increase in the rate of unemployment would you accept to achieve this outcome?*
>
> *I would accept at most:*
> () *No increase in unemployment*
> () *1 percentage point increase in unemployment*
> () *2 percentage point increase in unemployment*
> () *3 percentage point increase in unemployment*
> () *4 percentage point increase in unemployment*
> () *5 percentage point increase in unemployment*
> () *6 percentage point increase in unemployment*
> () *7 percentage point increase in unemployment*
> () *8 percentage point increase in unemployment*
> () *9 percentage point increase in unemployment*
> () *10 percentage point or more increase in unemployment*

The wording of the question about a lower growth rate of GDP was similar. For comparison, Binetti et al. (2024) and Pfajfar and Winkler (2024) also use hypothetical scenarios to elicit sacrifice ratios but they do not tie the scenarios to a respondent's desired inflation rate or inflation forecast. To be clear, we elicit *acceptable* sacrifice ratios rather than *necessary* sacrifice ratios.[8]

B. Descriptive statistics and validation

Table 9 and Figure 5 report the distribution of the desired rates of inflation (π^*). Consistently across countries, we find that, on average, households would like to see a deflation of roughly 2%-3%. However, the heterogeneity in responses is high (the standard deviation is about 6%): close to 50% of respondents would like to see deflation, another 10% would like to have zero inflation, approximately 20% of respondents would like to have inflation between zero and 3%, and the rest would like to see higher inflation rates. In the U.S., the desired inflation rate is around -1%. For comparison, Pfajfar and Winkler (2024) and Afrouzi et al. (2024) found that, in mid-2023 and early 2024 respectively, U.S. households viewed approximately zero inflation as optimal on average, but again subject to widespread disagreement. In most other countries, desired inflation averages closer to -2% to -3%, with Greece having the largest desired deflation of nearly -4%.

For most respondents, the desired rate of inflation is well below one-year-ahead inflation forecasts (Appendix Figure 1). Around 80% would like inflation to be lower than inflation forecasts, and the average desired change in inflation across all respondents is -7.3% (the standard deviation is 7.8%). Only 5% of respondents report that their inflation forecast is equal to their desired inflation rate. In a similar spirit, Pfajfar and Winkler (2024) found that, for U.S. households, the optimal inflation rate is considerably lower than households' perceptions of the Federal Reserve's inflation target.

In Panel A of Figure 6, we compare respondents' perceived recent inflation to their desired inflation rate over the next 3 years. We find a systematic negative relationship: the more that people think that inflation has been high recently, the larger the disinflation they would like. In Panel B of Figure 6, we compare the cumulative inflation in food and energy during and after the COVID19 crisis in each country to average desired inflation for those respondents. Again, we find a negative relationship, consistent with the notion that consumers would like prices to at least partially return to the levels seen before the inflation surge. This relationship suggests that households may prefer a

[8] See Pfajfar and Winkler (2024) for a discussion of the difference between these two notions of the sacrifice ratio.

form of price level targeting (PLT) where inflation shocks are offset by subsequent deflation. At the same time, prior work has documented that households tend to have a hard time understanding the forward-looking elements of average inflation targeting, such as the one announced by the Federal Reserve in 2020 (e.g., Coibion et al. 2023). Thus, policymakers should carefully weigh the pros and cons of adopting a PLT regime if they want to align policy with the desires of households.

How much would households be willing to sacrifice to implement these desired changes in inflation? Figure 7 plots the distributions of WTP in terms of consumption, while Table 10 reports summary statistics for distributions of WTP across all three measures.[9] On average, households would sacrifice quite a bit to bring inflation to their desired level: a 5.3% decrease in consumption, a 2.1% increase in unemployment, or a 2.0% lower growth rate of GDP. Consistent with the narrative in Shiller (1998) and Stantcheva (2024), consumers are therefore apparently willing to sacrifice a significant amount to achieve their desired inflation rates. Again, we observe considerable heterogeneity in WTP. Across countries, the WTP to reduce inflation is highest in Korea and Greece at 7% and 6% of consumption respectively, and lowest in the Netherlands and Belgium at 3% and 4% of consumption respectively. Considerable variation within each country is also present, as was the case with WTP to eliminate business cycle volatility. Many responses are reported in round numbers like 5%, again indicative of the uncertainty on the part of respondents about just how much they would be willing to sacrifice to achieve their ideal inflation rate. As illustrated in Panel C of Figure 8, respondents' willingness to pay to achieve their inflation target in terms of consumption is highly correlated with what they report they would be willing to sacrifice in terms of unemployment or GDP growth. However, 35-50% of respondents report that they would not be willing to accept *any* increase in unemployment or reduction in GDP growth to achieve their ideal inflation rate, even though few respondents report that they would not give up any consumption to do so. As with WTP to eliminate business cycles, these results suggest some altruistic motive: individuals are prepared to sacrifice some of their own consumption to achieve their ideal inflation but are more hesitant to inflict broader macroeconomic damage that could be borne by others.

One way to validate the reported WTPs is to verify whether those who would like to see larger changes in inflation tend to report a higher WTP to achieve those changes. Panel A of Figure 8 shows that this is indeed the case. The relationship is close to linear, with a slope of 0.26 for those who want lower inflation, indicating that each additional percentage point of bringing the

[9] Appendix Figures 2 and 3 show the distributions for WTP measured in terms of unemployment rate and GDP growth rate.

inflation to their desired rate is worth around 0.26% of consumption for most respondents. Households do not seem to view large deviations of inflation from their target as proportionally more costly than small deviations. By this metric, reducing inflation from 10% to 0% would therefore be worth approximately a 2.6% reduction in consumption, somewhat smaller than the average willingness to pay to reduce business cycles. A small but noticeable difference in the slope coefficient is present for those who would like to see higher inflation relative to those who would like to see lower inflation. Thus, consumers perceive some asymmetry in terms of the costs of inflation, with "too high" inflation being more costly than "too low" inflation.

Another way to check the quality of the WTP measures is to see how they correlate with uncertainty about inflation. In general, someone who expects more volatile inflation should be more willing to pay to reduce inflation (since lower inflation is more stable inflation). If the costs of inflation are increasing in the level of inflation, one would again expect consumers to be willing to pay more to reduce inflation when they are more uncertain about future inflation. Panel A of Figure 8 indeed documents a strong positive correlation between inflation uncertainty and WTP. These results are also consistent with Coibion et al. (2024) who show that a reduction in inflation uncertainty can increase significantly durable spending.

In addition, one might expect that WTP should be higher in countries with historically higher inflation rates. To assess this, Panel B of Figure 8 plots historical inflation rates for each country from 1991-2023 against WTP to reduce inflation. We see a positive correlation, such that countries with a history of higher inflation display a higher willingness to pay to reduce inflation.

We can develop the latter point further by studying the *acceptable* sacrifice ratio, i.e., the ratio of accepted change in the unemployment rate (or the growth rate of GDP) to $|E\pi - \pi^*|$. We find (Table 11) that the average sacrifice ratio is 0.49 for the unemployment rate and 0.45 for the GDP growth rate. Again, a lot of variation exists across countries and individuals. For example, survey respondents in Greece report an average sacrifice ratio of just 0.20 in terms of unemployment, indicating that they would accept an increase of only 0.2 p.p. in the unemployment rate to reduce inflation by 1 p.p. In contrast, Dutch respondents would be willing to accept an increase in the unemployment rate of around 0.7 p.p. to achieve the same decline in inflation. Hence, Dutch consumers appear to place much more weight on stabilizing inflation than unemployment. The U.S. is close to the middle of the distribution, with a sacrifice ratio of 0.54 for unemployment, consistent with Pfajfar and Winkler (2024). These values are much lower than the

magnitudes (typically well above 2) based on macroeconomic time series (e.g., Ball 1994, Tetlow 2022). Our findings suggest that, on average, households appear more reluctant to accept the actual costs of bringing inflation down compared with these estimates.

C. Predictors of cross-sectional variation in WTP

To better understand the variation across individuals in WTP for inflation reduction, Table 12 and columns (3)-(4) in Table 8 present results from regressing WTP for inflation on a wide range of observable characteristics and expectations, as done before for WTP for business cycles.[10] Several results stand out. First, as suggested by Panel A of Figure 8, the gap between desired and predicted inflation $|E\pi - \pi^*|$ is a very strong predictor of WTP: the larger the gap, the greater the willingness to pay to bring inflation to its target. The point estimate of 0.11 is smaller than the one found earlier without controls but also pools across those wanting higher vs lower inflation. Second, we find a similar inverted-U relationship between risk tolerance and WTP for inflation as for business cycles. Third, renters are generally willing to pay more to reduce inflation, consistent with homeowners having more protection against inflation or benefitting in terms of reduced real debt burdens. Similarly the employed (whose wages eventually adjust to inflation) and retirees (whose benefits are generally indexed to inflation) are less willing to pay to eliminate inflation than the unemployed or those out of the labor force. The liquidity constrained, unsurprisingly, are less willing to pay for anything than the unconstrained. Fourth, those who are more uncertain about future inflation have higher WTP. This result, combined with the fact that the conditional correlation with the level of inflation expectations is statistically insignificant, suggests that part of the reason why higher inflation rates are associated with a higher WTP to eliminate inflation (Figure 8, Panel B) is because higher inflation is associated with more volatile inflation. Finally, we find that individuals whose consumption, earnings and financial assets are more cyclical tend to have higher WTP more than those who are less exposed to business cycles. This suggests a potential correlation between WTP to stabilize business cycles and WTP for inflation, a possibility we explore in the next section.

D. Summary

Overall, we find that consumers around the world are willing to sacrifice quite a bit of consumption to bring inflation to their desired level, on the same order as what we found for the overall WTP to

[10] Regression results for WTP in terms unemployment rate and GDP growth rate are reported in Appendix Table 2 and Appendix Table 3.

eliminate business cycles. While large in absolute levels, the high WTP for inflation in part reflects the fact that most people view inflation as quite far from their ideal level. In marginal terms, their willingness to sacrifice inflation is not that high. When expressed in terms of sacrifice ratios, it is significantly lower than what empirical patterns suggest the actual tradeoff is between lower inflation and higher unemployment. In short, while consumers would generally prefer to see falling prices rather than a 2% inflation target, they don't seem willing to sacrifice all that much to get it, especially when the cost is borne by all of society in terms of higher unemployment or lower GDP growth.

VI. WTP: Inflation and Business Cycles as a "Package"

One feature that comes out of the cross-sectional regressions on the WTP for inflation and business cycles is that many of the observable characteristics seem to affect both in a similar manner: e.g., more uncertainty and higher cyclicality in income, assets and consumption all correlate strongly with a higher WTP to pay for both inflation stabilization and the elimination of business cycles. This suggests that there could be a link between the two.

To assess this possibility, Figure 9 plots binscatters of individuals' WTP to eliminate business cycles against their WTP to eliminate deviations of inflation from their desired rate. Overall, a very strong correlation between the two is present: ρ=0.66 for the pooled sample. Quantitatively, the link is strong as well: a one percentage point increase in the WTP for business cycles is associated with an almost one percentage point increase in WTP for inflation. This is true for every country in our sample, with the US displaying the lowest (but still high) correlation at 0.54 while Italy displays the highest at 0.73. It is also true across countries: those with the highest WTP to eliminate business cycles (Korea, USA and Greece) also have the highest WTP to eliminate inflation, while those with the lowest WTP to eliminate business cycles (Netherlands and Belgium) are also the ones with the lowest WTP to get rid of inflation. Across countries, the slope coefficient is again not far from one.

A priori, there is little reason to expect that there should be such a strong link between consumers' WTP to eliminate business cycles, which is a form of volatility, and their WTP to change the *level* of inflation. One possible source for the link could be if the level of inflation was strongly related to its volatility as documented in Okun (1971) and subsequent work, then one might expect factors like risk-aversion to generate similar WTP across the two metrics. Indeed, as

shown in Table 8, we do find that higher inflation uncertainty helps predict higher WTP for inflation, just like higher real uncertainty predicts a greater WTP to eliminate business cycles.

Another common factor behind a high WTP for both business cycles and inflation is more cyclicality in individuals' income, consumption and asset returns. The link to WTP for eliminating business cycles is a natural one: those whose incomes are more cyclical should see more benefit from eliminating business cycles than those whose incomes are acyclical. But why should this cyclicality in income be related to the WTP to eliminate inflation? One possible explanation is if individuals view inflation and business cycles as closely linked through supply-side forces. In that case, periods of low GDP growth would be periods when inflation is high and when individuals' incomes are low, clearly a scenario they would want to avoid. Consistent with this mechanism, prior work has documented extensively that households associate high inflation with bad states of the world (see Kamdar 2018, Candia et al. 2020, Stantcheva 2024).

To assess the extent to which individuals link WTP across business cycles and inflation, we exploit the fact that our information treatments induce exogenous variation in the WTP to eliminate business cycles. Specifically, we regress WTP for inflation on the WTP for business cycles, and instrument for the latter using our information treatments. As shown in Table 13, these instruments provide a powerful source of exogenous variation in the WTP to eliminate business cycles. The IV estimates indicate a causal effect running from WTP for business cycles to the WTP for inflation. The coefficient, however, is only half the size of the OLS coefficient, indicating that there is either causality running in the opposite direction too or another source of variation induces common movements in the two types of WTP.

This logic suggests that the reported WTPs likely refer to the combined effects of inflation and business cycles rather than *ceteris paribus* scenarios. Whereas macroeconomists largely view a persistent reduction in the level of inflation as independent of business cycle volatility, consumers seem to perceive a much more systematic and potentially causal connection between the two. If, as the old saying goes, in a crisis all correlations go to one, this view may not be incorrect. Because our models frequently deliver strict delineations between real, nominal and financial forces, the resulting calculations of welfare costs of business cycles reflect these delineations. Consumers, to the extent that they may view these mechanisms as more tightly connected, may therefore be taking a much more holistic view of what eliminating business cycles means.

VII. Concluding remarks

Macroeconomic theorists often contemplate not only impossible worlds but also how much people would desire to be in those worlds. Sometimes, conclusions from these high-powered intellectual exercises lead to conclusions that could be surprising to a lay person: inflation is not a big problem, business cycles are not a subject worth studying, etc. These inferences may be logically correct for a given set of assumptions. But recommendations on making the world a better place should perhaps occasionally be cross-checked against the views of the people whose welfare is being optimized. Our analysis is a step towards achieving this objective.

Using household surveys in many advanced economies, we find that people perceive business cycles and inflation as very costly overall. Respondents report that they would be willing to make considerable sacrifices to eliminate macroeconomic volatility or to bring inflation to their desired level. These sacrifices (or willingness to pay) are roughly two orders of magnitude larger than what is proposed by traditional macroeconomic theory, as summarized in Lucas (2003). Instead, our survey-based approach delivers estimates that are much more consistent with theoretical and empirical work that has emphasized relatively large costs of business cycles and inflation (e.g. Barlevy 2003, Constantinides 2021).

One reading of these results could be that they are nothing more than hypothetical numbers thrown out by people participating in a survey, with little bearing on whether anyone would actually sacrifice consumption on this order of magnitude for the purposes of eliminating business cycles or inflation. But one should be wary of being too dismissive. First, much of the cross-sectional variation that we observe, both across countries and individuals, is consistent with what theory would suggest (e.g., households who are more uncertain in their macroeconomic outlook are willing to pay more to avoid aggregate fluctuations). If the derivatives in the survey are correct, the levels may be as well. Second, the results are in line with a very large literature documenting qualitatively how much people dislike inflation (see Stantcheva 2024 for a recent review), though our evidence also suggests that people would hope to pay a lower price for bringing inflation down compared with the actual costs of doing so. Third, more anecdotal evidence from elections suggests that business cycles ("It's the economy, stupid" by Bill Clinton) and inflation ("And I won an election based on that. We're going to bring those prices way down" by Donald Trump) are important enough topics to determine the outcome of national elections.

As a result, it would be useful to see more future work delving into how costly business cycles and inflation are perceived to be by households and firms. One strategy to potentially refine

WTP measures could be to run incentivized randomized controlled trials although it would be challenging to implement these in large-scale and population-representative surveys. Another might be to measure WTP across topics to elicit a broader view of how individuals perceive the value of different outcomes. This analysis could be used to further refine our understanding of which aspects of macroeconomic fluctuations are particularly problematic and uses the obtained result to inform policy. Given the size of WTP observed in our surveys, one may want to investigate whether our findings apply to other settings and times.

Another reading could be that while the numbers from the survey may be right, people are wrong for thinking that way, and the theory is still correct in terms of what the costs of inflation and business cycles actually are. It is certainly the case that consumers are often poorly informed about economic conditions (Weber et al. 2022) or economic dynamics (Andre et al. 2022). But theory does not rule out much larger costs of business cycles (e.g., Barlevy 2003, Braxton and Sledz 2024) or inflation (Ropele, Gorodnichenko and Coibion 2024) such as the ones we find here. And other mechanisms not yet fully explored in theoretical models could be at work, such as altruistic motives or imperfect insurance, and help explain the high WTP that we document. So it seems premature, in the absence of evidence against the different classes of models that predict larger costs, to dismiss them summarily given that they are at least consistent with the evidence we provide here. Furthermore, the WTP to reduce inflation that households report is not out of line with quantitative models (e.g. Drenik and Perez 2020, Ropele et al. 2024).

Finally, even if it is the case that the Lucas (2003) order of magnitude is correct and consumers are wrong in their perceptions of how costly business cycles and inflation actually are, this is still important to know. People's perceptions, whether they are ultimately right or wrong, matter for their own decisions, for elections, for trust in institutions, and for the success of many policies that rely on confidence. Ignoring public perceptions of economic conditions and tradeoffs is a recipe for designing policies that may well succeed in theoretical models and perhaps even in practice, but yet may still fail in the polls and ultimately find themselves replaced by populist alternatives.

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Table 1. Certainty payment (risk tolerance).

country	mean	std	p10	p25	p50	p75	p90
Austria	112.0	76.9	20.0	50.0	100.0	150.0	200.0
Belgium	94.0	80.5	10.0	40.0	70.0	130.0	210.0
Germany	98.5	73.3	10.0	40.0	80.0	140.0	200.0
Greece	99.1	79.8	10.0	30.0	80.0	140.0	200.0
Spain	96.1	71.0	20.0	40.0	80.0	130.0	190.0
Finland	101.3	73.7	20.0	50.0	80.0	140.0	200.0
France	91.5	73.5	10.0	30.0	80.0	130.0	200.0
Ireland	106.5	76.4	20.0	40.0	100.0	150.0	220.0
Italy	108.6	78.7	10.0	40.0	100.0	150.0	220.0
Korea	105.4	87.6	10.0	40.0	80.0	150.0	240.0
Netherlands	104.0	80.0	10.0	40.0	90.0	140.0	210.0
Portugal	94.2	84.6	10.0	30.0	70.0	140.0	220.0
USA	96.3	87.1	10.0	20.0	80.0	130.0	240.0
Pooled	99.3	81.6	10.0	40.0	80.0	140.0	210.0

Notes: The table reports the certain payment (in local currency) chosen by respondents when they are presented between a certain amount and a lottery (50/50 chance for winning $0 or $300). The payments are reported in U.S. dollars.

Table 2. Micro- and macroeconomic subjective expectations, 1st (implied mean) and 2nd (implied standard deviation) moments.

country	Household consumption growth rate, %				GDP growth rate, %				Inflation rate, %			
	implied mean		implied std (uncertainty)		implied mean		implied std (uncertainty)		implied mean		implied std (uncertainty)	
	mean	std	mean	std	mean	std	mean	std	mean	std	mean	std
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
AT	3.1	5.1	2.2	2.5	-0.8	4.5	2.1	2.5	4.0	4.4	2.5	2.4
BE	2.5	4.5	2.1	2.5	-0.3	3.9	2.1	2.5	3.5	4.0	2.3	2.4
DE	2.3	4.9	1.8	2.2	-0.4	3.9	1.5	2.1	3.6	3.9	1.9	2.1
EL	4.1	7.8	3.3	3.2	-1.9	6.6	3.2	3.2	7.3	5.8	3.6	3.1
ES	2.4	5.3	2.2	2.6	0.2	4.2	2.0	2.6	4.3	4.4	2.4	2.5
FI	1.0	4.8	2.6	2.5	-0.9	3.8	2.4	2.5	3.0	4.0	2.7	2.3
FR	2.3	5.3	1.8	2.2	-1.1	4.1	1.6	2.1	3.7	3.9	1.9	2.1
IE	2.6	5.7	2.9	2.8	1.0	4.5	2.8	2.7	4.1	4.9	3.1	2.6
IT	2.2	5.8	2.4	2.6	-0.6	5.0	2.2	2.6	4.1	5.0	2.6	2.5
KR	4.9	5.3	2.1	2.2	0.6	4.9	1.8	2.2	5.3	4.0	2.2	2.2
NL	2.3	5.0	2.1	2.3	0.3	3.9	2.0	2.4	3.3	4.2	2.3	2.2
PT	2.5	5.8	2.9	2.7	-0.0	4.8	2.7	2.8	5.3	4.6	3.1	2.6
USA	3.1	5.6	3.7	3.4	1.3	5.6	3.7	3.5	4.5	4.9	4.2	3.4
Pooled	3.0	5.6	2.7	2.9	0.3	5.0	2.6	3.0	4.4	4.6	3.0	2.9

Notes: The table shows moments of economic expectations implied by the reported subjective probability distributions.

Table 3. Sensitivity of personal spending, income and assets to changes in GDP.

country	Consumer spending		Earnings		Financial assets	
	mean	std	mean	std	mean	std
	(1)	(2)	(3)	(4)	(5)	(6)
Austria	0.05	2.97	0.12	2.57	0.26	2.90
Belgium	0.36	2.62	0.45	2.63	0.53	2.73
Germany	0.02	3.46	0.16	3.48	0.33	3.54
Greece	0.20	4.16	0.64	3.87	0.29	3.68
Spain	0.28	3.29	0.34	2.99	0.52	2.97
Finland	0.27	3.02	0.13	2.98	0.39	2.92
France	0.23	3.11	0.32	2.88	0.46	2.93
Ireland	0.57	3.25	0.56	3.08	0.72	3.01
Italy	0.29	3.21	0.33	3.01	0.33	3.13
Korea	0.81	2.59	0.52	2.17	0.63	2.28
Netherlands	0.31	2.98	0.40	2.80	0.46	2.82
Portugal	0.31	2.98	0.41	2.73	0.55	2.85
USA	0.72	2.90	0.50	2.56	0.47	2.62
Pooled	0.48	3.06	0.41	2.80	0.47	2.85

Notes: the table reports moments of the perceived sensitivity of consumer spending, earnings and the value of financial assets in response to a hypothetical percent change in GDP.

Table 4. Survey questions for the willingness to pay to avoid business cycles.

	Survey question
A	Average economic growth in recent years is X.X%. Based on historical records, economic growth in 2025 is expected to fluctuate between A.A% and B.B% throughout the year. Suppose that you could reduce the fluctuation in economic growth as measured by total economic output (GDP) in 2025 by giving up a portion of your yearly spending. Now please fill the blank in the following sentence. To make economic growth stable at X.X% in 2025, I would be willing to reduce my spending by __ % over the next 12 months.
B	Average economic growth in recent years is X.X%. Based on historical records, economic growth is expected to fluctuate between A.A% and B.B% in 2025. Suppose that you could reduce the fluctuations in economic growth in 2025-2029 by giving up a portion of your yearly spending. Now please fill the blank in the following sentence. To make economic growth rate stable at 2.5% in 2025-2029, I would be willing to reduce my spending by __% per year.
C	The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. On average, in a boom the economy expands by Y.Y% and the unemployment rate is Z.Z%. However, sometimes the economy experiences a recession, meaning output contracts (negative economic growth) and unemployment is high. On average, in a recession the economy contracts by W.W% and unemployment is V.V%. Although the economy fluctuates, the average growth rate of GDP is X.X% and the average rate of unemployment is K.K%. Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs? I would be willing to reduce my annual consumption by __ % to have stable growth.
D	The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. In a boom the economy can expand by as much as M.M% and the unemployment rate can fall to N.N%. However, sometimes the economy experiences a recession, meaning output contracts and unemployment is high. In a recession the economy contracts by as much as P.P% and unemployment can rise to Q.Q%. Although the economy fluctuates, the average growth rate of the economy is X.X% and the average rate of unemployment is K.K%. Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs? I would be willing to reduce my annual consumption by __% to have stable growth.
E	The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. However, sometimes the economy experiences a recession, meaning output contracts and unemployment is high. The figures show how much the growth rate of economic growth and the rate of unemployment can vary over the business cycle. [insert figures with time series for unemployment rate and GDP growth rate] Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs? I would be willing to reduce my annual consumption by ____% to have stable growth.

Notes: The table shows the template for eliciting willingness to pay to avoid business cycles. Text in red is specific to the country of residence for a given respondent. Specific values are reported in Appendix Table 5.

Table 5. Willingness to pay (% reduction in consumption) to avoid business cycles.

country	mean	std	p10	p25	p50	p75	p90
Austria	4.4	4.6	0.0	1.0	3.0	5.5	10.0
Belgium	3.7	3.9	0.0	1.0	2.2	5.0	10.0
Germany	4.2	4.1	0.0	1.0	3.5	5.0	10.0
Greece	5.9	5.0	0.0	2.0	5.0	10.0	12.5
Spain	5.7	4.8	0.5	2.0	5.0	10.0	10.5
Finland	4.1	4.1	0.0	1.0	3.0	5.0	10.0
France	4.5	4.2	0.0	1.5	3.5	5.5	10.0
Ireland	5.7	5.0	0.2	2.0	5.0	10.0	10.2
Italy	5.8	4.8	0.5	2.0	5.0	10.0	10.0
Korea	7.8	5.6	1.0	3.0	5.0	10.0	20.0
Netherlands	3.4	3.5	0.0	1.0	2.2	5.0	10.0
Portugal	5.3	4.5	1.0	2.0	5.0	10.0	10.0
USA	6.1	5.3	0.0	2.0	5.0	10.0	15.0
Pooled	5.7	5.0	0.0	2.0	5.0	10.0	10.0

Notes: The table reports the fraction (in percent) of consumer spending that a respondent is willing to sacrifice to eliminate business cycle fluctuations.

Table 6. The effect of presented information on willingness to pay (WTP) to avoid business cycles.

	Dependent variable: WTP, % reduction in consumption			
	Full sample	Full sample	USA & Korea	Euro area
	(1)	(2)	(3)	(4)
Version B: ST forecast & reduce volatility in 2025-2029	-0.12	-0.11	-0.25*	0.00
	(0.09)	(0.09)	(0.14)	(0.11)
Version C: Average variation over the business cycle	0.87***	0.87***	0.50***	1.18***
	(0.10)	(0.10)	(0.15)	(0.13)
Version D: Max variation over the business cycle	1.14***	1.13***	0.82***	1.38***
	(0.10)	(0.10)	(0.15)	(0.12)
Version E: Figure with time series of unemployment rate & GDP growth rate	1.60***	1.62***	1.50***	1.73***
	(0.11)	(0.10)	(0.16)	(0.14)
Country fixed effects	No	Yes	Yes	Yes
Observations	36,090	36,090	16,284	19,806
R-squared	0.02	0.07	0.03	0.06

Notes: the table reports OLS regression results where the dependent variable is willingness to pay to avoid business cycles (measured in % consumption a respond is willing to sacrifice to avoid macroeconomic fluctuations) on a set of indicator variables where each indicator variable equals one when a given version of the survey question is asked and zero otherwise. The omitted category is ST forecast & reduce volatility in 2025 (version A). Heteroskedasticity robust standard errors are reported in parentheses. ***,**,* show statistical significance at 1, 5 and 10 percent.

Table 7. Predictors of WTP to eliminate business cycles.

	(1)
Expected HH cons. growth, 12-month, implied mean	0.011***
	(0.004)
Expected GDP growth, 12-month, implied mean	0.041***
	(0.004)
Expected uncertainty: HH cons. growth, 12-month, implied std	0.089***
	(0.013)
Expected uncertainty: GDP growth, 12-month, implied std	0.095***
	(0.014)
Risk tolerance	0.087***
	(0.007)
Risk tolerance^2/100	-0.291***
	(0.025)
Sensitivity to GDP	
|HH spending|	0.111***
	(0.012)
|Earnings|	0.069***
	(0.012)
|Financial assets|	0.084***
	(0.012)
Prob. of losing a job in 12 months	0.005***
	(0.001)
I(Employed)	-0.273***
	(0.048)
I(Retiree)	-0.272***
	(0.068)
I(liquidity constrained)	-0.043
	(0.038)
Housing (omitted: own w/o mortgage)	
Own with mortgage	-0.016
	(0.048)
Rent	0.164***
	(0.052)
Other	0.145
	(0.099)
100×log(household income)	0.004***
	(0.000)
Male	-0.298***
	(0.039)
Age	0.038***
	(0.008)
Age^2/100	-0.036***
	(0.008)
I(have one or more children)	0.074
	(0.047)
Race/Ethnicity (omitted: White)	
African American	0.258**
	(0.115)
Asian American	0.510***
	(0.153)
Other	0.190
	(0.155)
Hispanic	0.108
	(0.117)
Education (omitted: high school)	
Less than high school	0.043
	(0.080)
Some college	-0.009
	(0.072)
College	0.211***
	(0.065)
Post-college graduate	0.129**
	(0.054)
Country Fixed Effects (FE)	Yes
Information interventions FE	Yes
Hypothetical macro exposure FE	Yes
Observations	34,344
R-squared	0.133

Notes: the table reports regression results where the dependent variable is willingness to pay to avoid business cycles (measured in % consumption a respond is willing to sacrifice to avoid macroeconomic fluctuations) on a set of socioeconomic variables and various expectations. All regressions are estimated with Huber (1964) robust regression. Heteroskedasticity robust standard errors are reported in parentheses. ***, **,* show statistical significance at 1, 5 and 10 percent.

Table 8. Shapley decomposition of R^2 for cross-sectional regressions for willingness to pay (WTP).

	WTP Business cycles		WTP Inflation	
Blocs of variables	(1)	(2)	(3)	(4)
Economic outlook	21.1%	29.4%	17.0%	22.3%
$\lvert E\pi - \pi^* \rvert$	-	-	34.3%	42.5%
Exposure to business cycles	17.9%	17.3%	11.6%	14.0%
Wealth and income	4.4%	7.2%	4.6%	4.6%
Risk tolerance	3.5%	4.3%	4.2%	5.8%
Demographics	7.3%	11.0%	8.0%	10.9%
Information provision	25.1%	30.9%		
Country fixed effects	20.8%	-	20.4%	

Notes: the table reports Shapley (1953) decomposition of R^2 by blocs of socioeconomic variables. *Economic outlook* includes implied mean and uncertainty for the growth rate of GDP (columns 1 and 2), inflation rate (columns 3 and 4), and personal consumption growth (columns 1-4). $\lvert E\pi - \pi^* \rvert$ includes only the absolute value of the difference between predicted and desired inflation rates. *Exposure to business cycles* includes sensitivity of personal consumption, earnings, and the value of financial assets; probability of losing a job; employment status. *Wealth and income* includes (log) household income and indicator variables for housing arrangement and liquidity constraints. *Risk tolerance* includes certainty payment and the square of certainty payment. *Demographics* includes gender, age, age squared, indicator variables for having at least one child, race, ethnicity, and educational attainment. *Information provision* (columns 1 and 2) includes a set of indictor variables for each version of the survey question eliciting willingness.

Table 9. Desired rate of inflation, % per year.

country	mean	std	p10	p25	p50	p75	p90
Austria	-2.8	5.6	-10.0	-10.0	-2.0	1.0	3.0
Belgium	-2.2	5.1	-10.0	-6.0	0.0	1.0	4.0
Germany	-3.4	5.3	-10.0	-10.0	-2.0	0.0	2.0
Greece	-3.8	7.0	-10.0	-10.0	-5.0	0.0	10.0
Spain	-2.3	5.1	-10.0	-6.0	-1.0	1.0	3.0
Finland	-3.5	5.5	-10.0	-10.0	-3.0	0.0	3.0
France	-2.6	5.4	-10.0	-8.0	-1.0	1.0	3.0
Ireland	-3.2	6.1	-10.0	-10.0	-4.0	1.0	5.0
Italy	-2.8	5.7	-10.0	-10.0	-2.0	1.0	4.0
Korea	-2.8	7.2	-10.0	-10.0	-3.0	2.5	10.0
Netherlands	-2.0	5.1	-10.0	-5.0	-1.0	1.0	4.0
Portugal	-2.2	5.2	-10.0	-7.0	0.0	2.0	3.0
USA	-0.9	6.0	-10.0	-5.0	0.0	3.0	7.0
Pooled	-2.1	6.0	-10.0	-9.0	-1.0	2.0	5.0

Notes: the table reports the desired rate of inflation over the next three years.

Table 10. Willingness to pay to bring inflation from expected to desired levels.

country	Decrease in consumption, %					Increase in unemployment, %					Slowdown of GDP growth, %				
	mean	std	p25	p50	p75	mean	std	p25	p50	p75	mean	std	p25	p50	p75
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Austria	4.5	4.2	1.0	3.0	5.0	2.1	2.5	0.0	1.0	3.0	1.8	2.3	0.0	1.0	2.0
Belgium	3.6	3.7	1.0	2.0	5.0	1.6	2.3	0.0	1.0	2.0	1.6	2.2	0.0	1.0	2.0
Germany	4.3	4.0	1.0	4.0	5.0	1.6	2.0	0.0	1.0	2.0	1.5	2.1	0.0	1.0	2.0
Greece	6.4	5.3	2.0	5.0	10.0	1.3	2.2	0.0	0.0	2.0	1.4	2.3	0.0	0.0	2.0
Spain	5.0	4.2	2.0	4.1	6.0	1.4	2.1	0.0	1.0	2.0	1.5	1.9	0.0	1.0	2.0
Finland	4.4	4.2	1.0	3.0	5.1	1.6	2.2	0.0	1.0	2.0	1.7	2.0	0.0	1.0	2.0
France	4.2	3.9	1.0	3.0	5.0	1.3	1.9	0.0	1.0	2.0	1.5	2.1	0.0	1.0	2.0
Ireland	5.7	4.6	2.0	5.0	10.0	1.8	2.3	0.0	1.0	3.0	2.0	2.1	0.0	1.0	3.0
Italy	5.6	4.7	2.0	5.0	10.0	1.4	2.1	0.0	1.0	2.0	1.3	2.0	0.0	1.0	2.0
Korea	7.4	5.3	3.0	5.0	10.0	2.8	2.5	1.0	2.0	5.0	2.3	2.3	0.0	2.0	3.0
Netherlands	3.4	3.3	1.0	2.0	5.0	1.8	2.2	0.0	1.0	3.0	1.9	2.1	0.0	1.0	3.0
Portugal	4.7	4.1	2.0	3.0	6.0	1.7	2.2	0.0	1.0	3.0	1.6	2.1	0.0	1.0	2.0
USA	5.7	4.8	2.0	5.0	10.0	2.6	3.1	0.0	2.0	4.0	2.5	2.8	0.0	2.0	4.0
Pooled	5.3	4.7	2.0	5.0	9.0	2.1	2.6	0.0	1.0	3.0	2.0	2.4	0.0	1.0	3.0

Notes: The reports willingness to pay (WTP) to bring inflation from the expected level (one year ahead inflation forecast) to the desired level (over the next three years). WTP is measured in terms of reduced consumption (columns 1-5), increased unemployment (columns 6-10), or lower growth rate of GDP (columns 11-15).

Table 11. Sacrifice ratio.

country	Unemployment rate					Growth rate of GDP				
	mean	std	p25	p50	p75	mean	std	p25	p50	p75
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Austria	0.60	1.06	0.00	0.20	0.67	0.44	0.81	0.00	0.17	0.50
Belgium	0.60	1.22	0.00	0.10	0.57	0.54	1.03	0.00	0.12	0.56
Germany	0.43	0.91	0.00	0.10	0.40	0.40	0.81	0.00	0.10	0.40
Greece	0.20	0.59	0.00	0.00	0.20	0.21	0.60	0.00	0.00	0.20
Spain	0.41	0.93	0.00	0.06	0.38	0.42	0.85	0.00	0.11	0.41
Finland	0.48	1.06	0.00	0.12	0.48	0.44	0.85	0.00	0.17	0.50
France	0.40	0.88	0.00	0.08	0.40	0.43	0.82	0.00	0.12	0.50
Ireland	0.46	0.94	0.00	0.14	0.50	0.49	0.87	0.00	0.20	0.50
Italy	0.40	0.95	0.00	0.05	0.33	0.35	0.79	0.00	0.06	0.33
Korea	0.57	0.95	0.05	0.25	0.62	0.45	0.75	0.00	0.20	0.50
Netherlands	0.72	1.32	0.00	0.23	0.75	0.68	1.09	0.00	0.25	0.75
Portugal	0.56	1.17	0.00	0.15	0.50	0.48	1.00	0.00	0.11	0.38
USA	0.54	0.99	0.00	0.17	0.57	0.49	0.88	0.00	0.19	0.53
Pooled	0.49	0.98	0.00	0.14	0.50	0.45	0.85	0.00	0.14	0.50

Notes: the table reports sacrifice ratios measured as the percentage point increase in unemployment (columns 1-5) or percentage point decrease in the growth rate of GDP (columns 6-10) over the percentage point change in the rate of inflation necessary to bring inflation for a one-year-ahead forecast to a desired level.

Table 12. Predictors of WTP to bring inflation from expected to desired levels.

	(1)
Expected inflation rate, 12-month, implied mean	0.005
	(0.005)
Expected uncertainty: Inflation rate, 12-month, implied std	0.147***
	(0.008)
$\lvert E\pi - \pi^* \rvert$	0.109***
	(0.003)
Risk tolerance	0.078***
	(0.007)
Risk tolerance^2/100	-0.250***
	(0.025)
Sensitivity to GDP	
|HH spending|	0.081***
	(0.012)
|Earnings|	0.032***
	(0.012)
|Financial assets|	0.026**
	(0.011)
Prob. of losing a job in 12 months	0.001
	(0.001)
I(Employed)	-0.155***
	(0.047)
I(Retiree)	-0.221***
	(0.064)
I(liquidity constrained)	-0.238***
	(0.040)
Housing (omitted: own w/o mortgage)	
Own with mortgage	0.074
	(0.048)
Rent	0.143***
	(0.050)
Other	-0.022
	(0.097)
100×log(household income)	0.004***
	(0.000)
Male	-0.167***
	(0.038)
Age	0.030***
	(0.008)
Age^2/100	-0.031***
	(0.008)
I(have one or more children)	0.048
	(0.048)
Race/Ethnicity (omitted: White)	
African American	0.337*
	(0.178)
Asian American	0.788***
	(0.213)
Other	-0.007
	(0.236)
Hispanic	0.374**
	(0.182)
Education (omitted: high school)	
Less than high school	0.073
	(0.073)
Some college	-0.168**
	(0.078)
College	0.214***
	(0.068)
Post-college graduate	0.247***
	(0.051)
Country Fixed Effects (FE)	Yes
Information interventions FE	Yes
Hypothetical macro exposure FE	Yes
Observations	27,028
R-squared	0.153

Notes: the table reports regression results where the dependent variable is willingness to pay to bring inflation from an expected level to a desired level (measured in % consumption a respondent is willing to sacrifice to achieve this goal) on a set of socioeconomic variables and various expectations. All regressions are estimated with Huber (1964) robust regression. Heteroskedasticity robust standard errors are reported in parentheses. ***,**,* show statistical significance at 1, 5 and 10 percent.

Table 13. WTP for business cycles and inflation.

Dependent variable: WTP for inflation	OLS		Instrumental variables (IV)			
			Differentiate euro area and USA/Korea		pooled	
	(1)	(2)	(3)	(4)	(5)	(6)
WTP for business cycle	0.62***	0.61***	0.38***	0.39***	0.36***	0.37***
	(0.01)	(0.01)	(0.04)	(0.04)	(0.04)	(0.04)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Control for socioeconomics	No	Yes	No	Yes	No	Yes
Observations	29,483	28,293	29,483	28,293	29,483	28,293
R-squared	0.46	0.46	0.40	0.41	0.39	0.40
1st stage F-stat			50.24	53.99	94.56	103.5

Notes: the table reports regression results where the dependent variable is willingness to pay (WTP) to bring inflation from an expected level to a desired level (measured in % consumption a respond is willing to sacrifice to achieve this goal) and the regressors are willingness to pay to eliminate business cycles as well as socioeconomic variables and country fixed effects. In columns (1) and (2), the regressions are estimated with OLS. In columns (3)-(6), WTP for business cycles is instrumented with a set of indicator variables for each (randomly selected) version of the question eliciting WTP for business cycles. That is, the first-stage regression is given by Table 6. In columns (5)-(6), the set of instruments pools across countries (columns (1)-(2) in Table 6). In columns (3)-(4), the set of indicator variables is separate for USA/Korea and euro area (columns (3) and (4) respectively in Table 6). Heteroskedasticity robust standard errors are reported in parentheses. ***,**,* show statistical significance at 1, 5 and 10 percent.

Figure 1. Binscatter plots for micro- and macroeconomic subjective expectations.

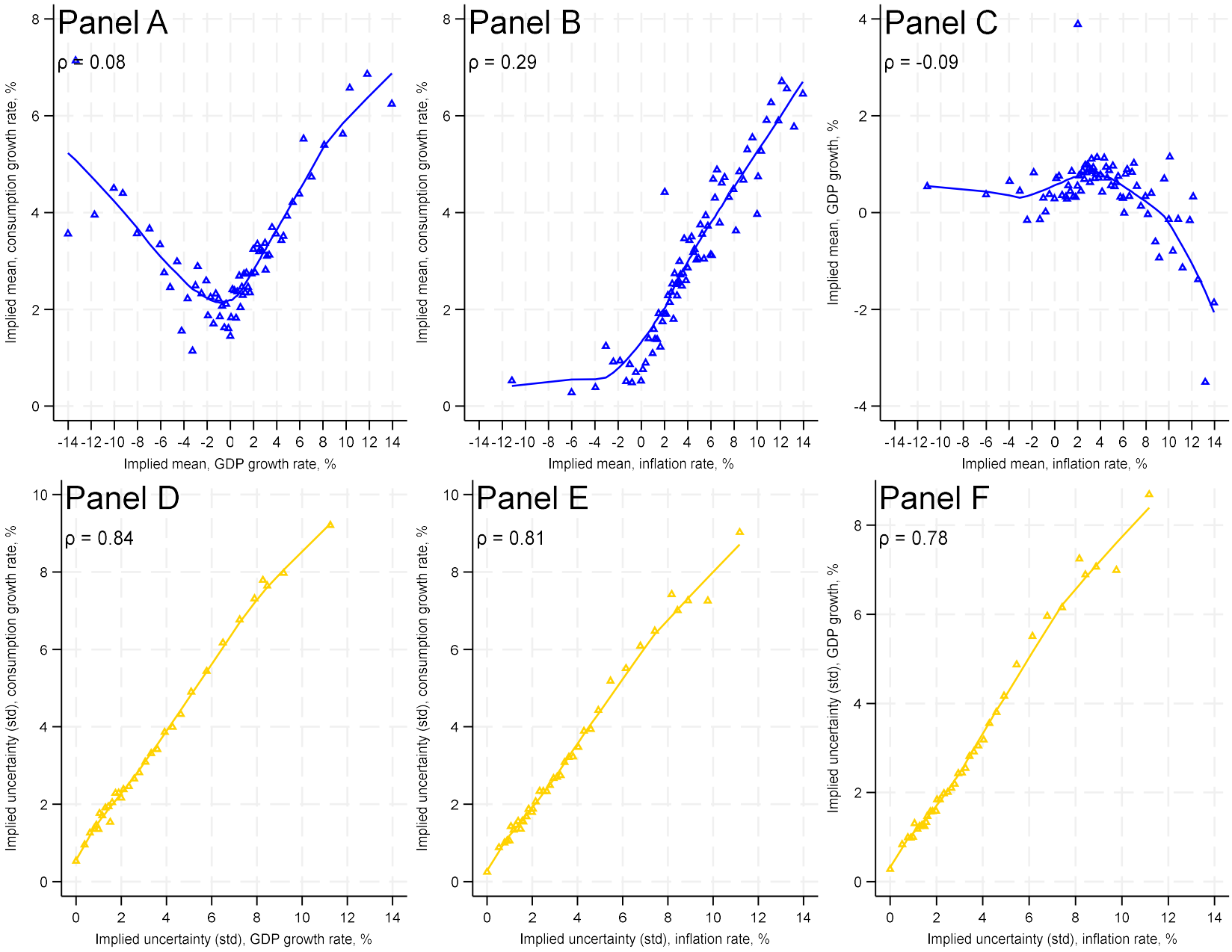
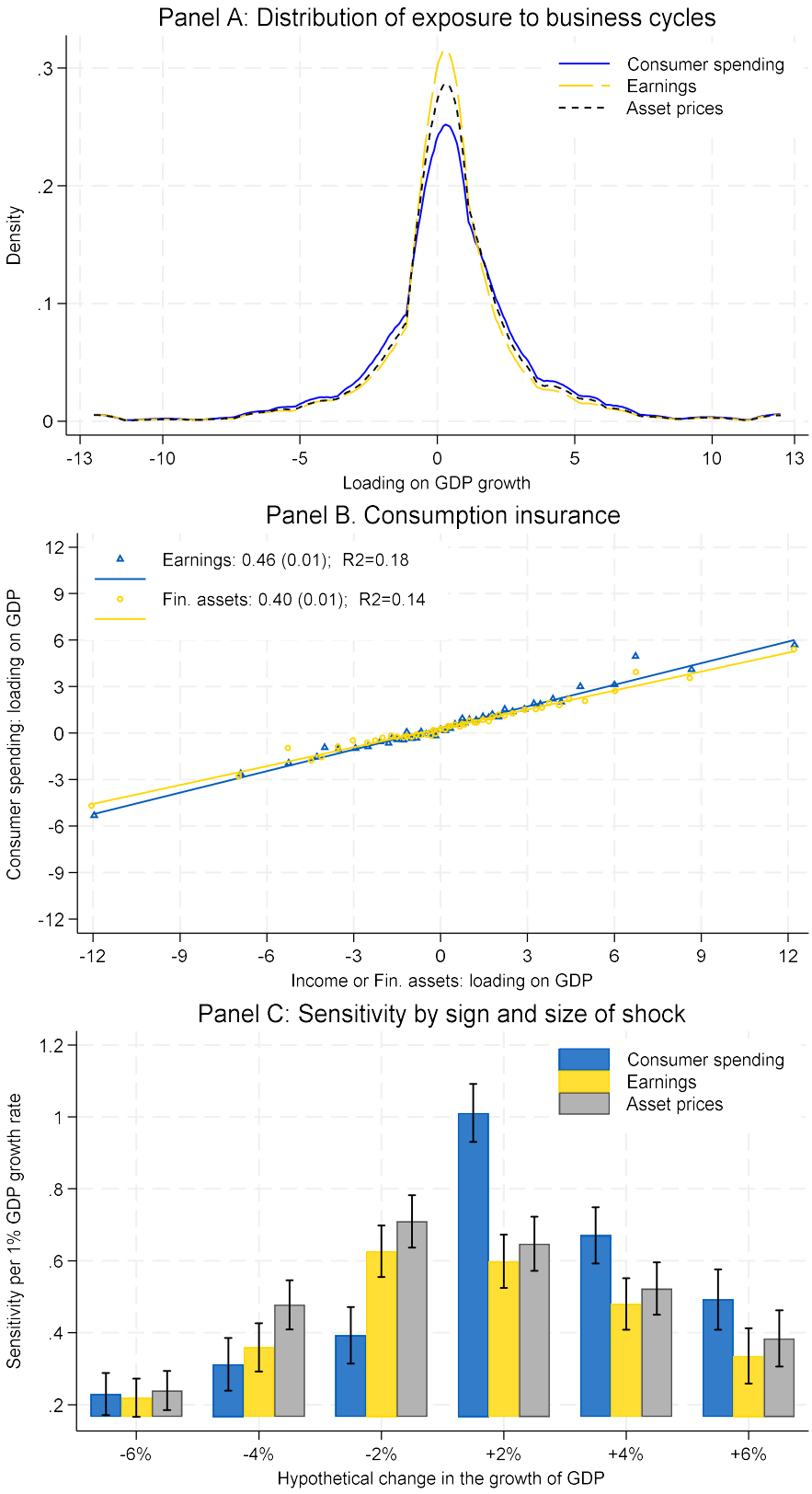
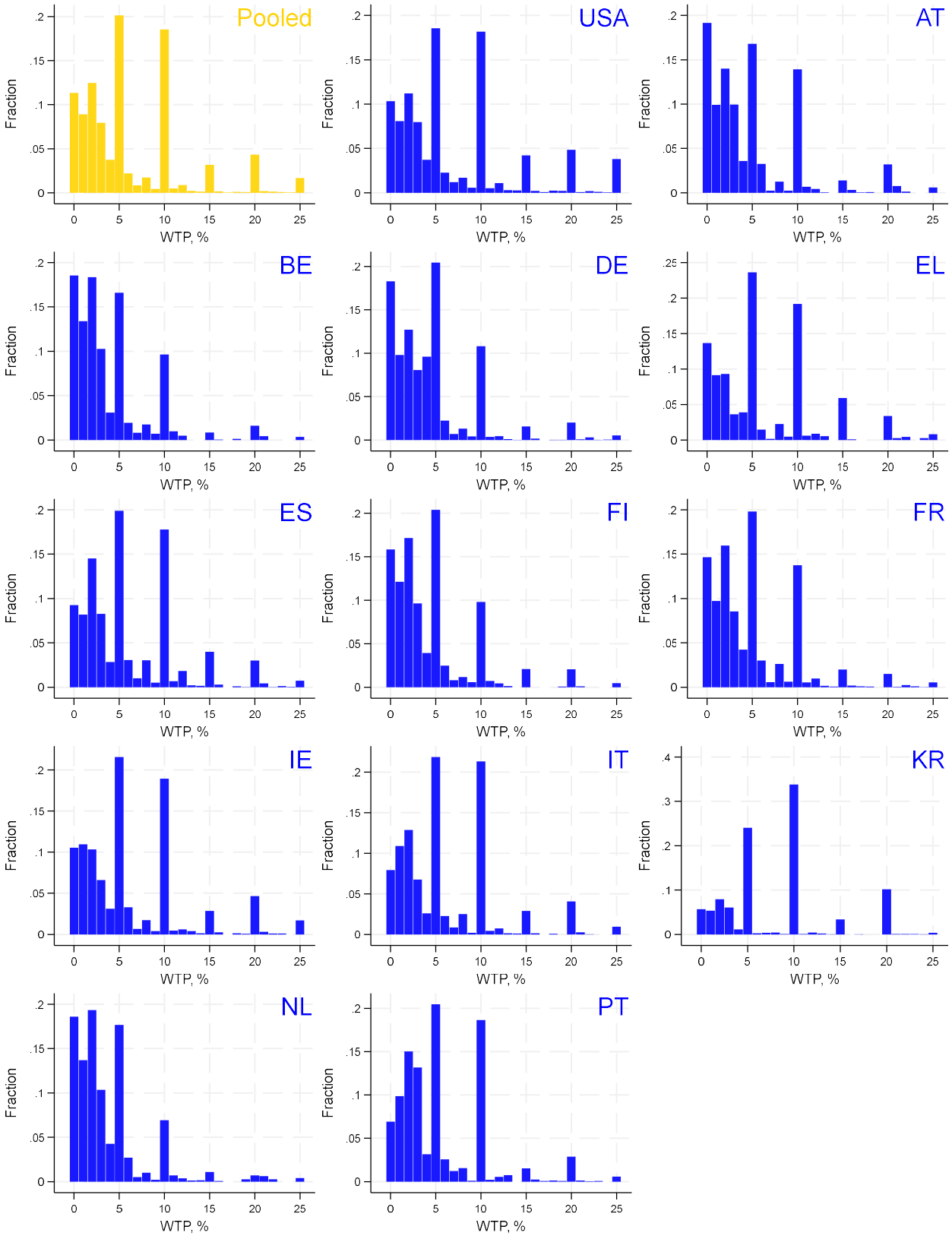


Figure 2. Perceived exposure to business cycles.



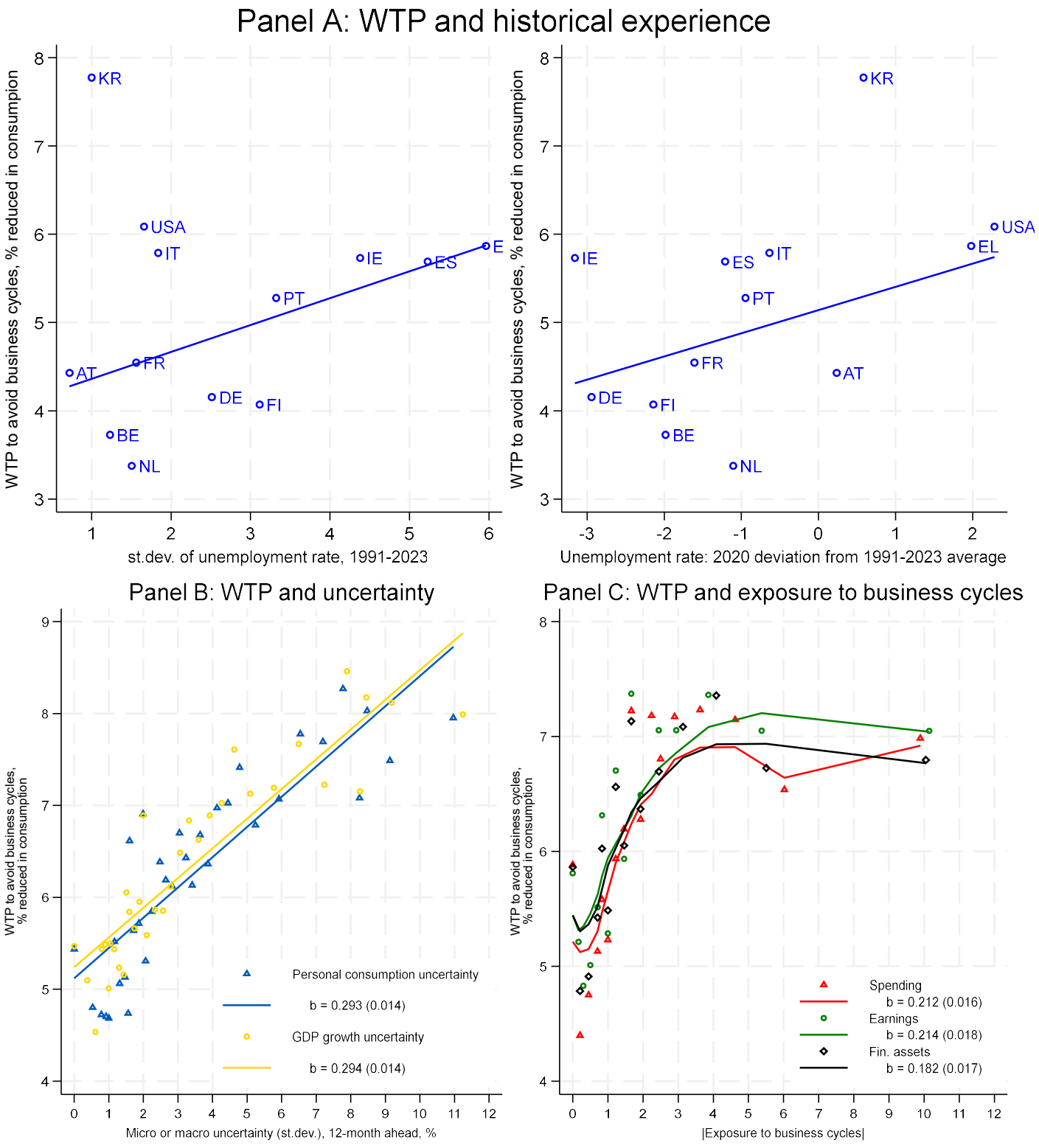
Notes: Panel A shows kernel densities for perceived exposure for consumption, earnings, and the value of financial assets to hypothetical changes in GDP. Panel B shows binscatter plots for perceived exposure of consumption vs. perceived exposure of earnings and the values of financial assets. Panel C shows how the average perceived exposure varies by the size of hypothetical change in GDP. Whiskers show 95% confidence intervals for the estimated means.

Figure 3. Willingness to pay to eliminate business cycles.



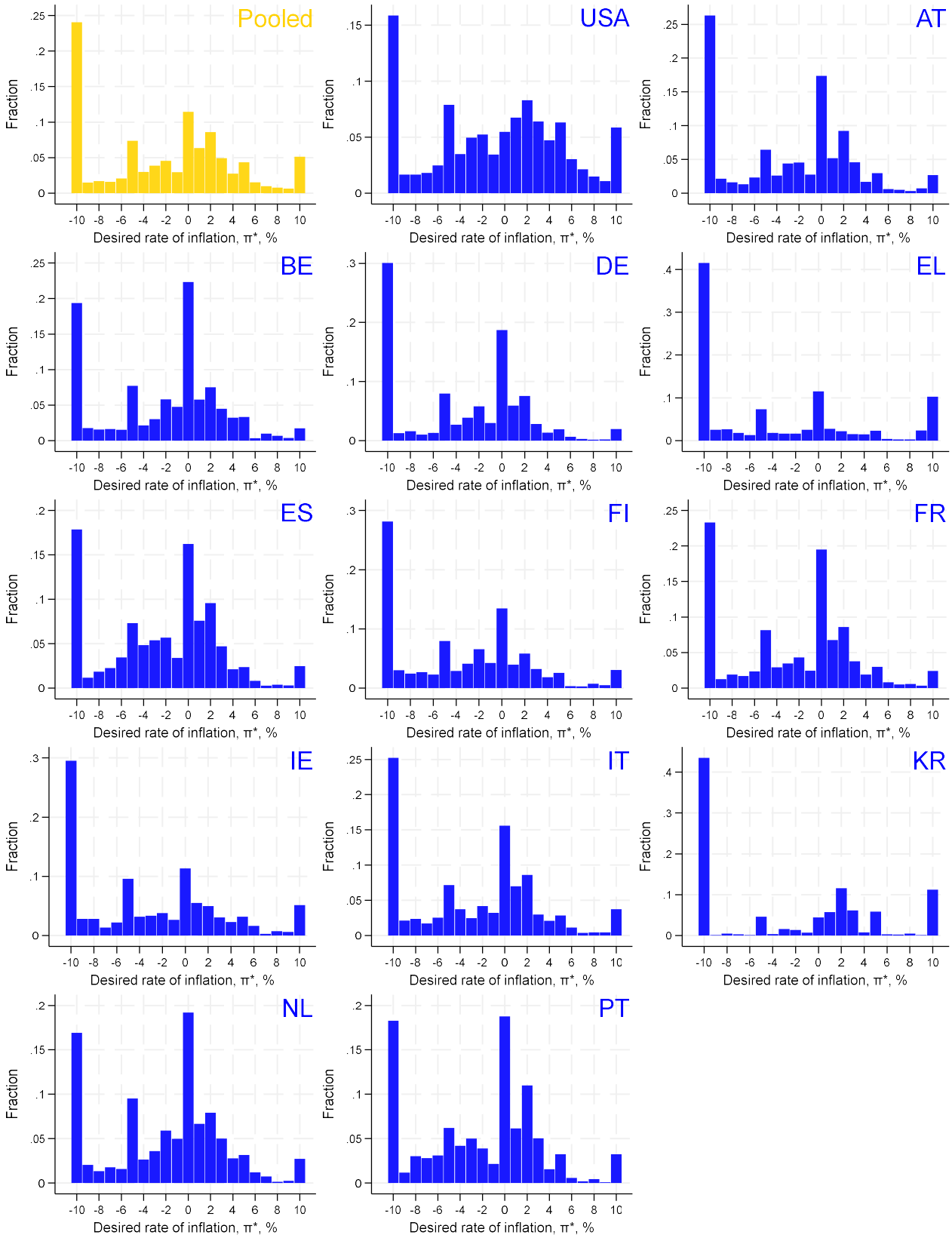
Notes: willingness to pay (WTP) is measured in % reduction of consumption. WTP responses are pooled across versions of the survey question eliciting WTP.

Figure 4. Willingness to pay (WTP) to avoid business cycles vs. expected uncertainty and historical experience.



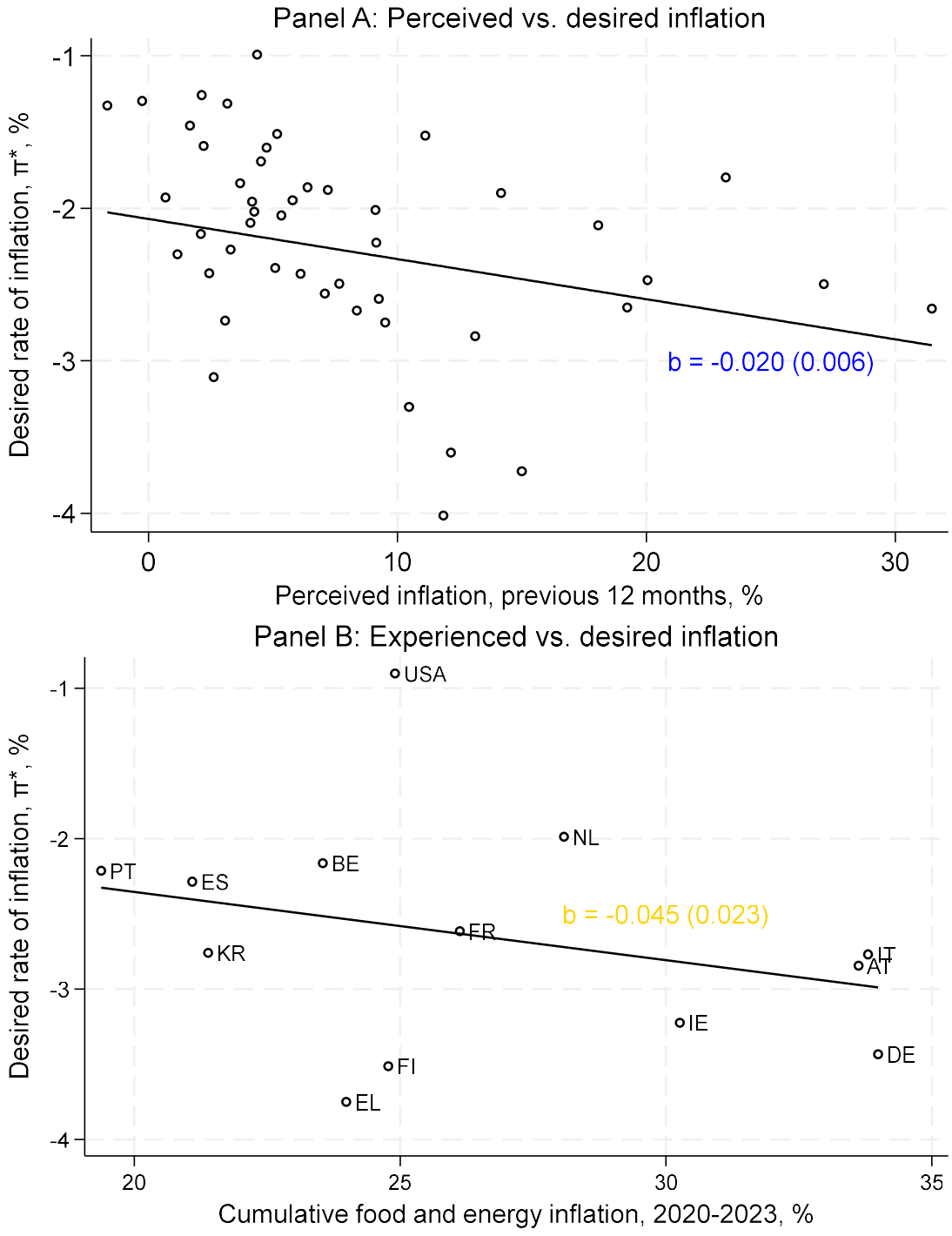
Notes: Data for horizontal axes in Panel A are from the World Bank. Panel B is a binscatter plot of willingness to pay (WTP) to avoid business cycles vs. uncertainty about the growth rate of GDP or uncertainty about the growth rate of personal (household-level) consumption. Panel C is a binscatter plot of WTP to avoid business cycles vs. (absolute value of) exposure to business cycles for consumer spending, earnings, and the value of financial assets. For Panels B and C, *b* reports the slope of the fitted linear relationship and values in parentheses are the corresponding robust standard errors.

Figure 5. Desired rate of inflation.



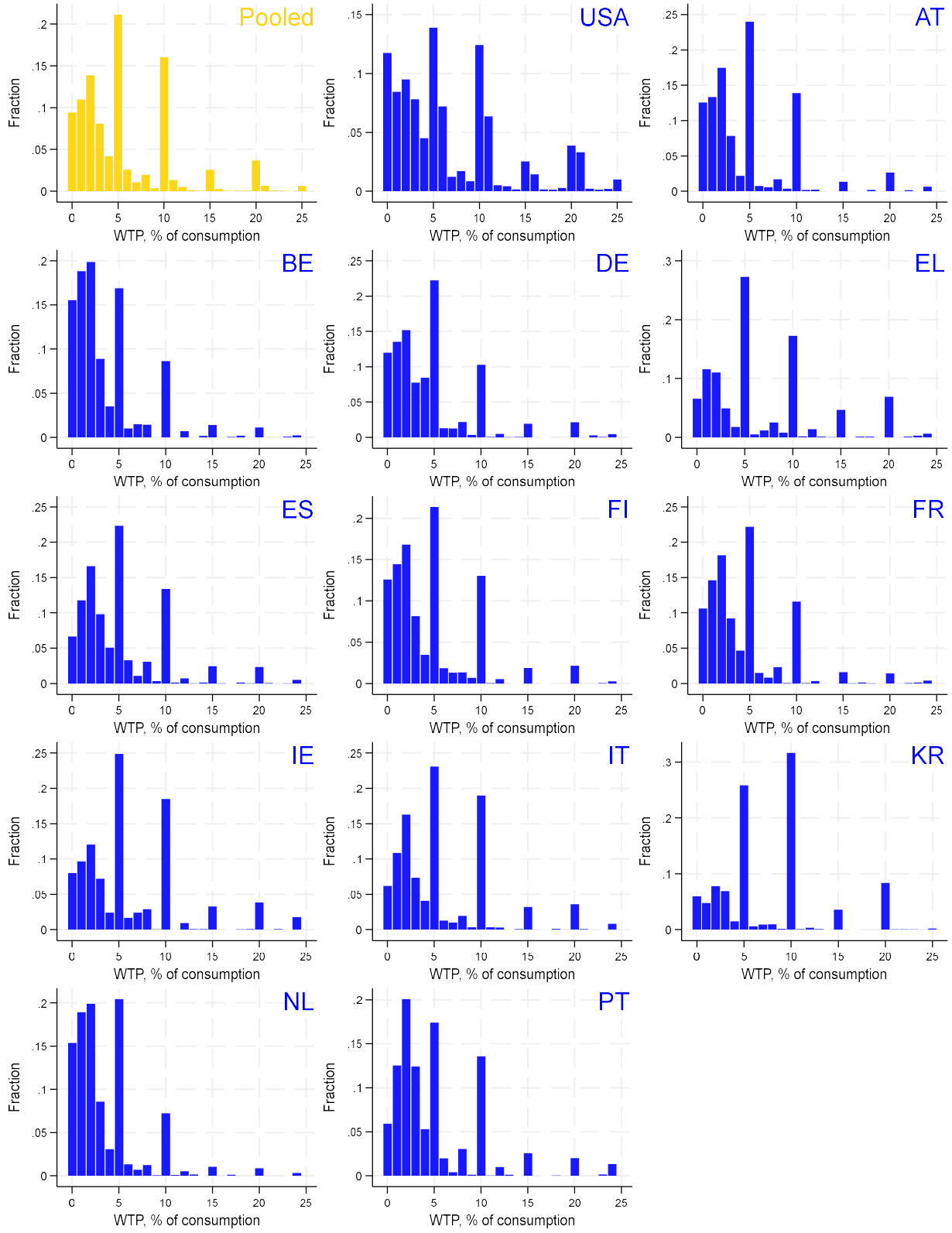
Notes: each panel plots histograms for the distribution of desired rates of inflation (over the next three years).

Figure 6. Desired Inflation vs. Perceived and Experienced Inflation



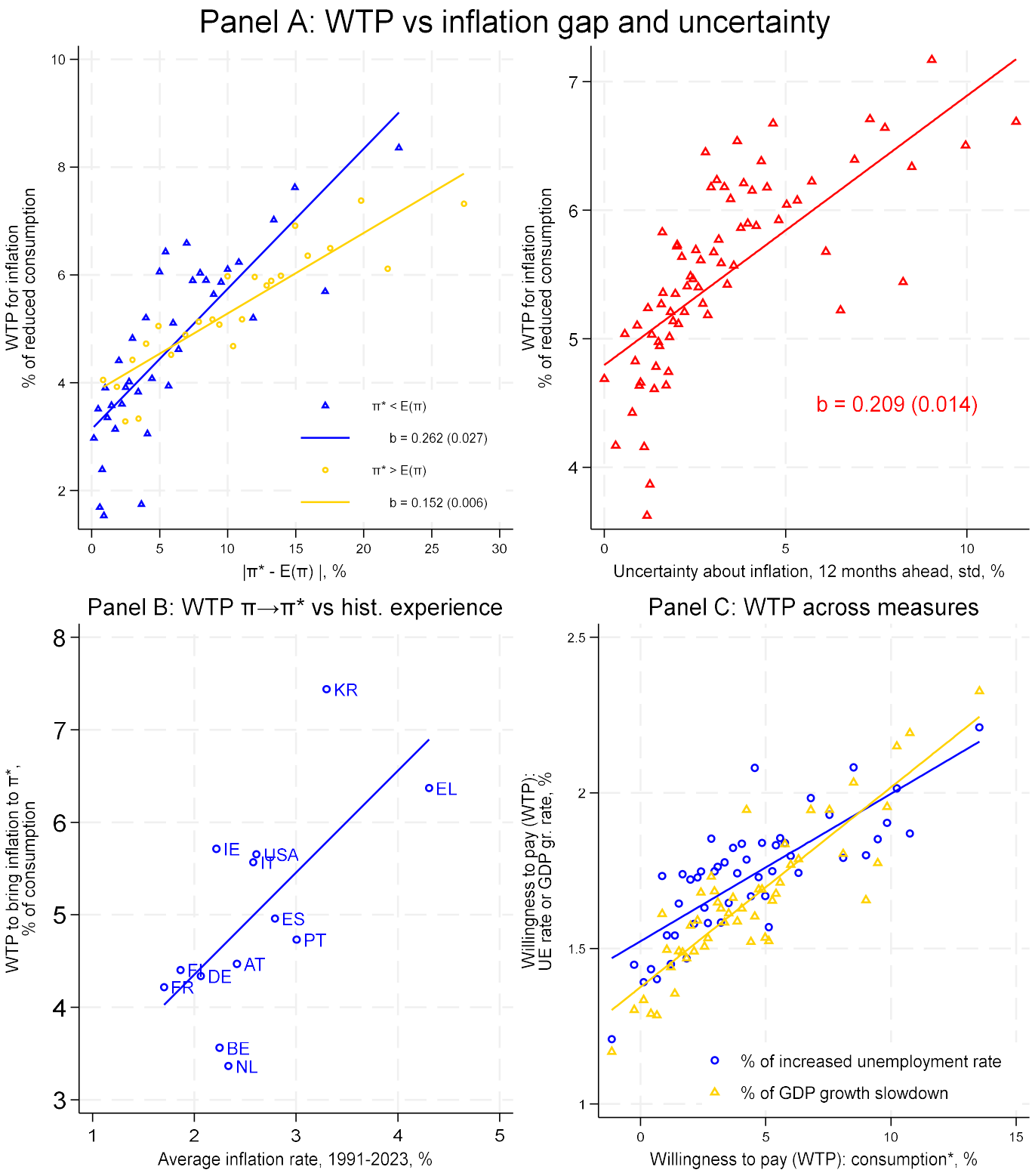
Notes: Panel A plots a binscatter plot of respondents' perceptions of inflation over the previous 12 months vs. the desired rate of inflation over the next 3 years (after controlling for country fixed effects). Panel B plots a scatter of cumulative inflation for food and energy over the period of 2020-2023 vs. the desired rate of inflation over the next 3 years

Figure 7. Willingness to pay to bring inflation from expected to desired levels.



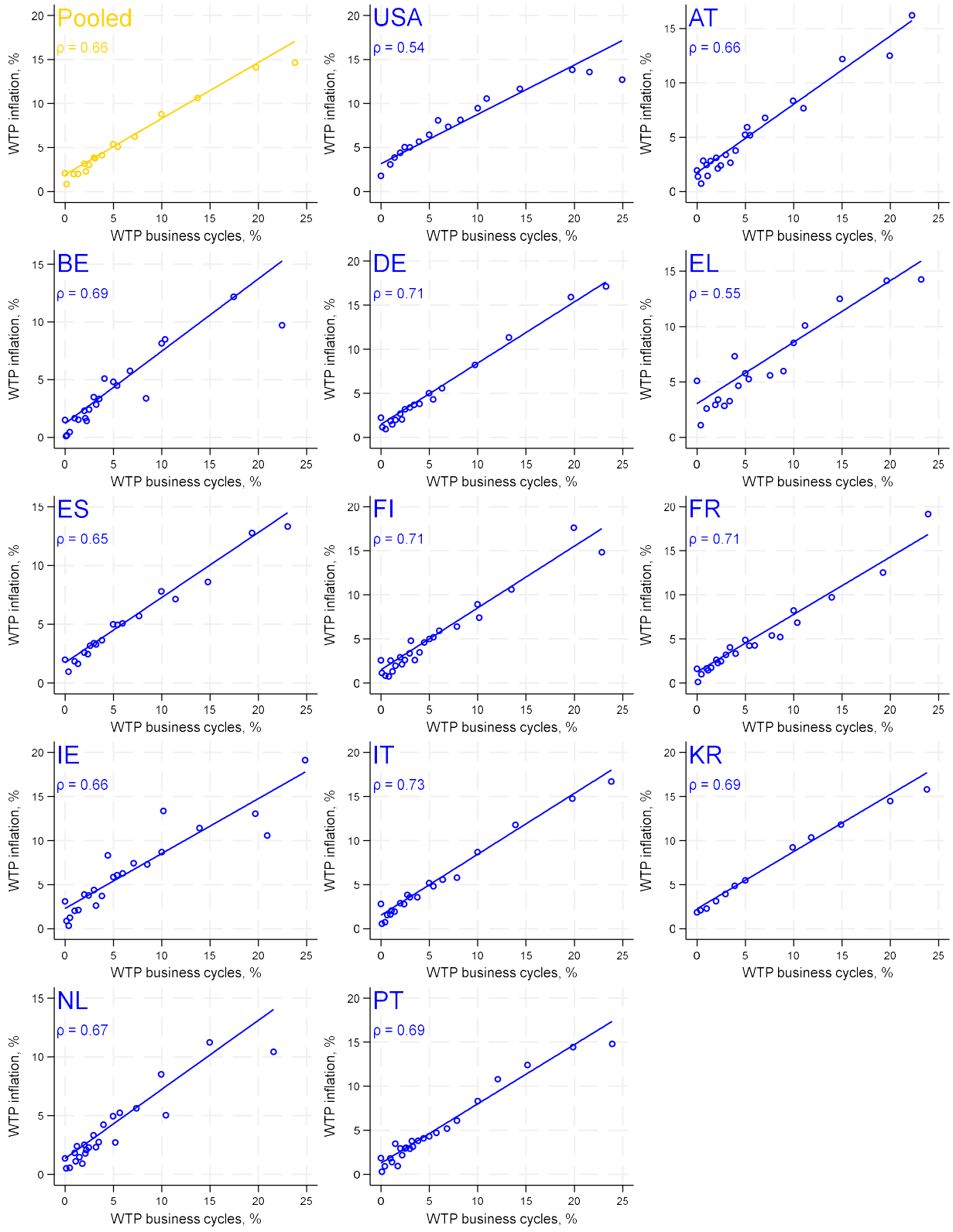
Notes: each panel plots histograms for the distribution of willingness to pay (measured as percent of consumption) that respondents would be ready to sacrifice to bring inflation from expected rates of inflation (one year ahead inflation forecast) to desired rates of inflation (over the next three years).

Figure 8. Cross-checks for willingness to pay (WTP) to bring inflation from expected to desired levels.



Notes: Panel A shows binscatter plots of willingness to pay (WTP) to bring inflation expected levels to desired levels vs distance from expected to desired levels and uncertainty in one-year-ahead inflation forecast (standard deviation implied by the reported subjective probability distribution). Data for the horizontal axis in Panel B are from the World Bank. Panel C is a binscatter plot of willingness to pay (WTP to bring inflation from expected to desired levels) in terms of consumption vs. increased unemployment rate or lower growth rate of GDP.

Figure 9. Willingness to pay (% reduction in consumption) to avoid business cycles vs. bring inflation to π^*.

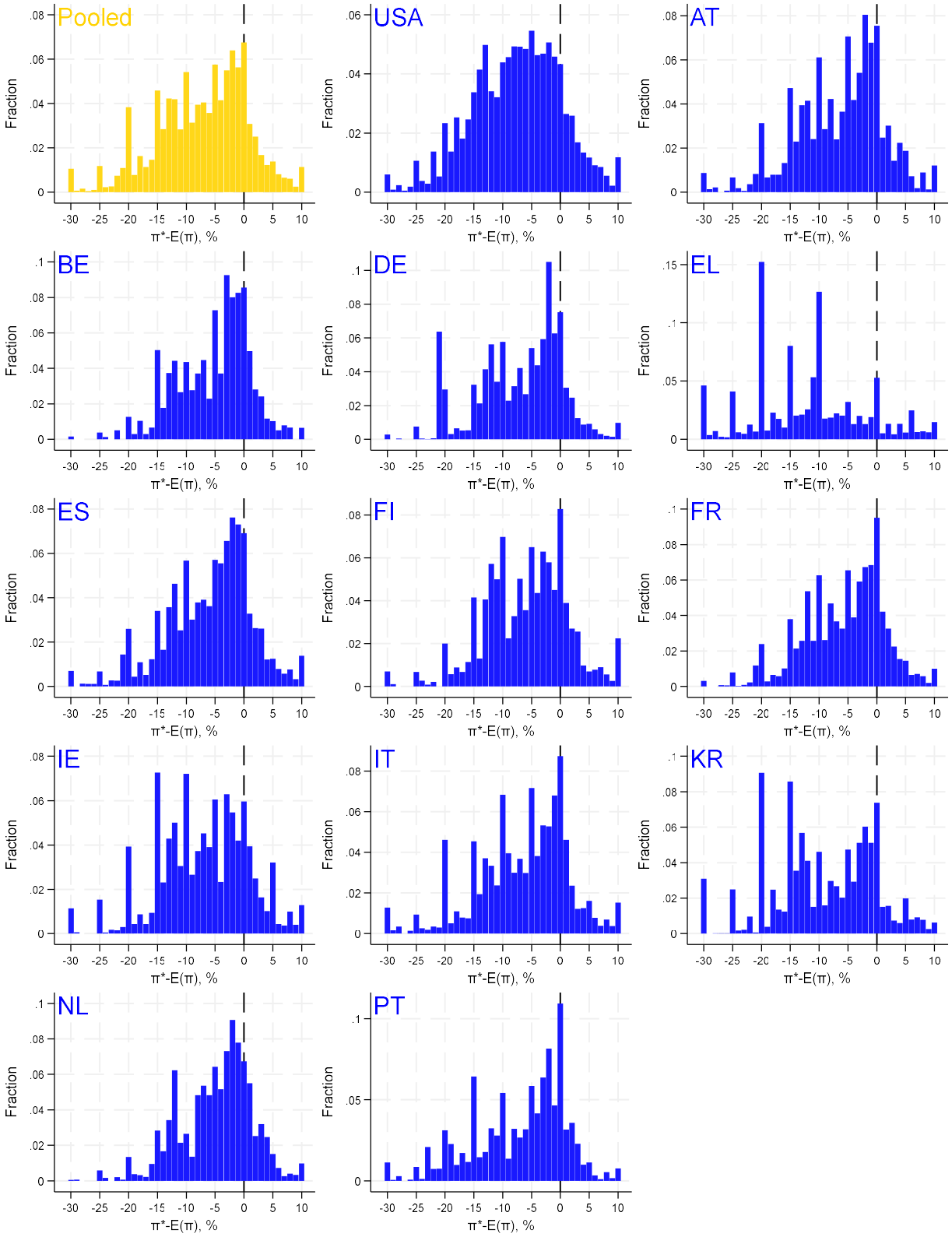


Notes: Each panel is a binscatter plot of willingness to pay (WTP; measured in % of consumption) to avoid business cycles vs. WTP (measured in % of consumption) to bring inflation from expected to desired levels. Correlation ρ is reported in the subtitle for each panel.

ONLINE APPENDIX

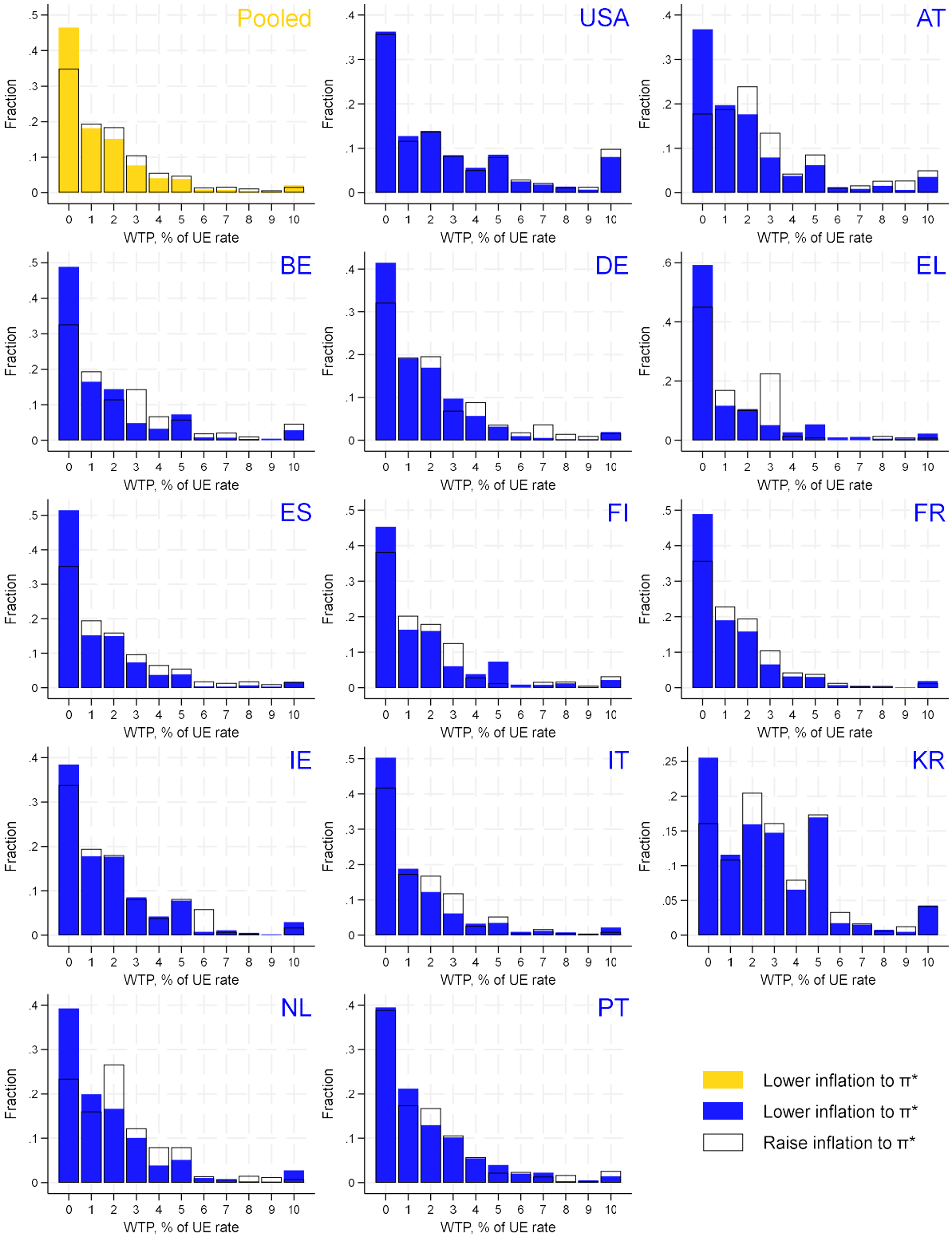
APPENDIX A: ADDITIONAL FIGURES AND TABLES.

Appendix Figure 1. $\pi^* - E(\pi)$.

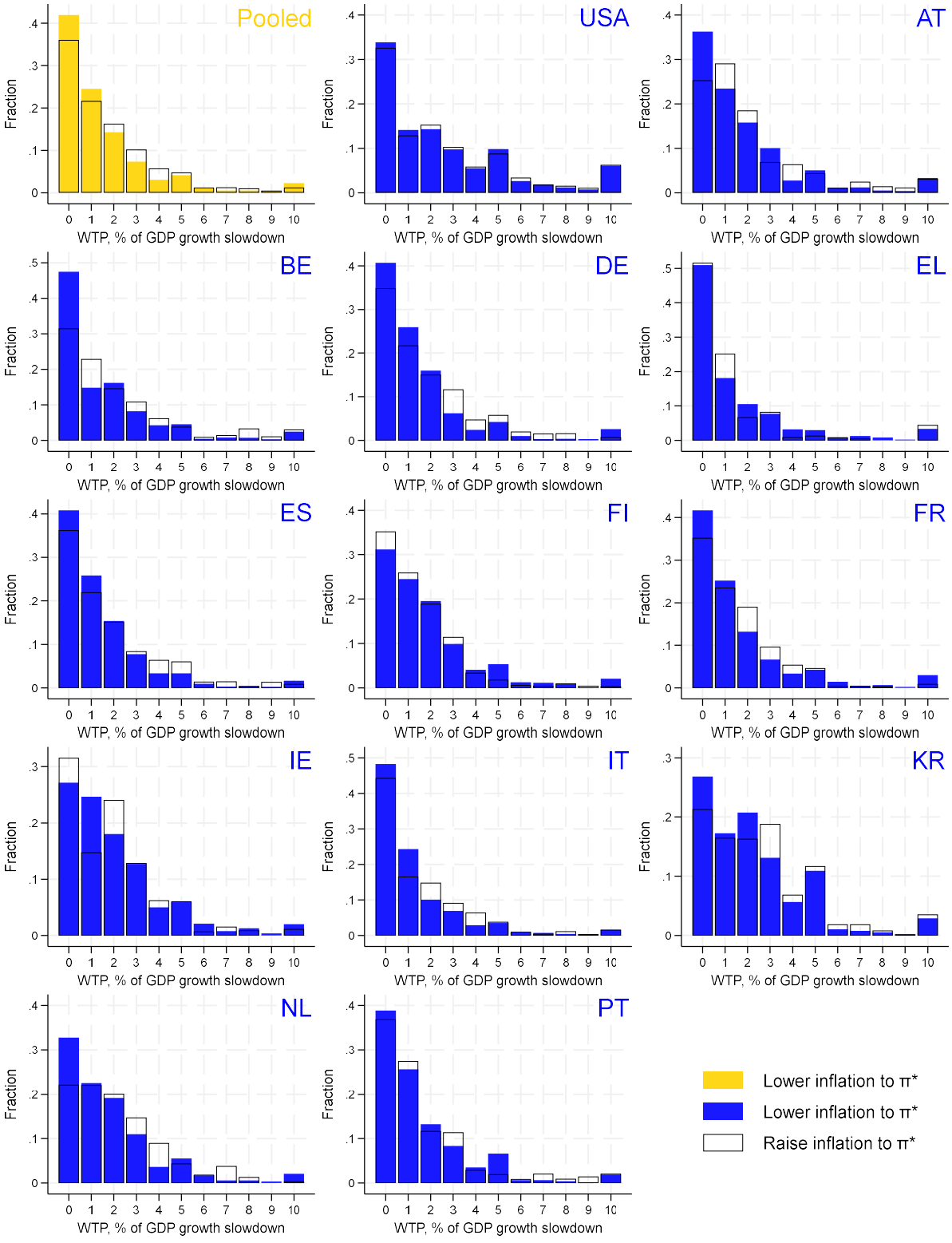


Notes: The sample restricted to respondents who reported expected inflation (one year ahead horizon) between -20% and +20%.

Appendix Figure 2. Willingness to pay to bring inflation to the desired inflation rate, % increase in unemployment rate.



Appendix Figure 3. Willingness to pay to bring inflation to the desired inflation rate, % slowdown in GDP growth rate.



Appendix Table 1. Summary statistics for Korean Embrain data.

Variables	Sample (*N = 5,000*)		National statistics
	Mean	Std dev.	Mean
	(1)	(2)	(3)
Female	0.45	0.50	0.50
Age	40.81	10.51	44.9
Living in Seoul Metropolitan Area	0.62	0.49	0.51
Tertiary education (age 25-64)	0.88	0.32	0.55
HH income (yearly, after-tax, KRW)	77,247k	120,905k	58,640k
Employed (age 15-64)	0.83	0.38	0.70
Homeownership	0.61	0.49	0.61
Household size	2.84	1.19	2.2

Note: National statistics for living in the Seoul Metropolitan Area, tertiary education, homeownership, and household size are from 2023, and statistics for age, household income and employment are from 2024. Household (HH) income variable is trimmed at bottom and top 1%.

Appendix Table 2. Predictors of WTP (% of increased unemployment) to bring inflation from expected to desired levels.

	(1)
Expected inflation rate, 12-month, implied mean	-0.007***
	(0.002)
Expected uncertainty: Inflation rate, 12-month, implied std	0.039***
	(0.003)
$\lvert E\pi - \pi^* \rvert$	-0.004**
	(0.001)
Risk tolerance	-0.015***
	(0.003)
Risk tolerance^2/100	0.093***
	(0.011)
Sensitivity to GDP	
|HH spending|	0.018***
	(0.005)
|Earnings|	0.033***
	(0.005)
|Financial assets|	0.042***
	(0.005)
Prob. of losing a job in 12 months	0.001*
	(0.001)
I(Employed)	-0.008
	(0.020)
I(Retiree)	-0.105***
	(0.026)
I(liquidity constrained)	-0.052***
	(0.016)
Housing (omitted: own w/o mortgage)	
Own with mortgage	-0.056***
	(0.020)
Rent	-0.057***
	(0.021)
Other	-0.270***
	(0.041)
100×log(household income)	-0.001***
	(0.000)
Male	0.188***
	(0.016)
Age	-0.009**
	(0.003)
Age^2/100	-0.001
	(0.003)
I(have one or more children)	0.076***
	(0.020)
Race/Ethnicity (omitted: White)	
African American	-0.124**
	(0.051)
Asian American	0.236***
	(0.071)
Other	-0.280***
	(0.065)
Hispanic	0.131**
	(0.053)
Education (omitted: high school)	
Less than high school	0.092***
	(0.033)
Some college	0.074**
	(0.030)
College	0.168***
	(0.026)
Post-college graduate	0.116***
	(0.021)
Country Fixed Effects (FE)	Yes
Information interventions FE	Yes
Hypothetical macro exposure FE	Yes
Observations	31,239
R-squared	0.123

Notes: the table reports regression results where the dependent variable is willingness to pay to bring inflation from an expected level to a desired level (measured in % increase in the rate of unemployment that a respondent is willing to tolerate to achieve this goal) on a set of socioeconomic variables and various expectations. All regressions are estimated with Huber (1964) robust regression. Heteroskedasticity robust standard errors are reported in parentheses. ***,**,* show statistical significance at 1, 5 and 10 percent.

Appendix Table 3. Predictors of WTP (% of low GDP growth rate) to bring inflation from expected to desired levels.

	(1)
Expected inflation rate, 12-month, implied mean	-0.007***
	(0.002)
Expected uncertainty: Inflation rate, 12-month, implied std	0.073***
	(0.003)
$\lvert E\pi - \pi^* \rvert$	0.003**
	(0.001)
Risk tolerance	-0.001
	(0.003)
Risk tolerance^2/100	0.032***
	(0.011)
Sensitivity to GDP	
|HH spending|	0.014***
	(0.004)
|Earnings|	0.017***
	(0.005)
|Financial assets|	0.018***
	(0.005)
Prob. of losing a job in 12 months	0.002***
	(0.001)
I(Employed)	-0.000
	(0.019)
I(Retiree)	-0.061**
	(0.026)
I(liquidity constrained)	-0.081***
	(0.016)
Housing (omitted: own w/o mortgage)	
Own with mortgage	-0.026
	(0.019)
Rent	-0.045**
	(0.021)
Other	-0.187***
	(0.039)
100×log(household income)	-0.001***
	(0.000)
Male	0.028*
	(0.016)
Age	0.006*
	(0.003)
Age^2/100	-0.013***
	(0.003)
I(have one or more children)	0.070***
	(0.020)

	(1) continued
Race/Ethnicity (omitted: White)	
African American	-0.021
	(0.051)
Asian American	0.195***
	(0.071)
Other	-0.327***
	(0.064)
Hispanic	0.033
	(0.051)
Education (omitted: high school)	
Less than high school	-0.020
	(0.032)
Some college	0.128***
	(0.030)
College	0.155***
	(0.026)
Post-college graduate	0.099***
	(0.021)
Country Fixed Effects (FE)	Yes
Information interventions FE	Yes
Hypothetical macro exposure FE	Yes
Observations	31,478
R-squared	0.092

Notes: the table reports regression results where the dependent variable is willingness to pay to bring inflation from an expected level to a desired level (measured in % increase in the rate of unemployment that a respondent is willing to tolerate to achieve this goal) on a set of socioeconomic variables and various expectations. All regressions are estimated with Huber (1964) robust regression. Heteroskedasticity robust standard errors are reported in parentheses. ***,**,* show statistical significance at 1, 5 and 10 percent.

Appendix Table 4. Shapley decomposition of R^2 for cross-sectional regressions for willingness to pay (WTP).

	WTP Inflation (percentage point increase in unemployment rate)		WTP Inflation (percentage point decrease in the growth rate of GDP)	
Blocs of variables	(1)	(2)	(3)	(4)
Economic outlook	11.3%	13.0%	29.7%	35.3%
$\lvert E\pi - \pi^* \rvert$	0.6%	0.8%	0.2%	0.2%
Exposure to business cycles	24.4%	27.5%	12.8%	14.8%
Wealth and income	7.4%	12.8%	9.0%	14.9%
Risk tolerance	10.9%	12.4%	4.5%	5.2%
Demographics	30.4%	33.5%	24.9%	29.6%
Country fixed effects	15.1%		19.0%	

Notes: the table reports Shapley (1953) decomposition of R^2 by blocs of socioeconomic variables. *Economic outlook* includes implied mean and uncertainty for the growth rate of GDP (columns 1 and 2), inflation rate (columns 3 and 4), and personal consumption growth (columns 1-4). $\lvert E\pi - \pi^* \rvert$ includes only the absolute value of the difference between predicted and desired inflation rates. *Exposure to business cycles* includes sensitivity of personal consumption, earnings, and the value of financial assets; probability of losing a job; employment status. *Wealth and income* includes (log) household income and indicator variables for housing arrangement and liquidity constraints. *Risk tolerance* includes certainty payment and the square of certainty payment. *Demographics* includes gender, age, age squared, indicator variables for having at least one child, race, ethnicity, and educational attainment. *Information provision* (columns 1 and 2) includes a set of indictor variables for each version of the survey question eliciting willingness.

Appendix Table 5. Values for average/extreme unemployment rate and GDP growth rate shown in survey questions eliciting willingness to pay to avoid business cycles.

Country	X.X	A.A	B.B	Y.Y	Z.Z	W.W	V.V	K.K	M.M	N.N	P.P	Q.Q
AT	1.8	-13.6	11.7	2.5	4.9	-3.1	5.6	5.0	11.7	3.2	-13.6	7.1
BE	1.8	-12.8	15.6	2.4	7.7	-2.7	7.3	7.6	15.6	5.1	-12.8	9.9
FI	1.5	-8.9	8.2	3.3	9.5	-2.6	8.6	9.2	8.2	2.9	-8.9	17.5
FR	1.5	-18.0	17.9	2.1	9.6	-3.1	9.4	9.6	17.9	7.1	-18.0	12.5
DE	1.5	-10.6	10.8	2.2	6.6	-2.2	6.5	6.6	10.8	2.9	-10.6	11.2
EL	0.9	-16.0	14.7	3.2	12.4	-5.2	17.4	13.8	14.7	6.8	-16.0	28.1
IE	5.7	-9.6	26.2	7.1	8.8	-3.3	9.8	8.9	26.2	3.9	-9.6	15.9
IT	0.8	-17.6	18.1	1.9	9.5	-2.8	9.7	9.6	18.1	6.0	-17.6	12.9
NL	2.1	-8.9	11.6	2.8	5.8	-1.8	5.5	5.8	11.6	3.1	-8.9	8.7
PT	1.6	-17.8	17.2	2.9	8.0	-3.2	11.0	8.7	17.2	4.8	-17.8	18.2
ES	2.0	-21.7	19.4	3.3	15.3	-3.6	20.5	16.2	19.4	8.0	-21.7	26.3
KR	2.1	-0.7	4.3	8.0	3.3	-1.2	3.9	3.6	13.7	1.9	-7.3	8.2
USA	2.5	1.1	4.7	2.8	5.5	-2.5	8.2	5.7	12.0	3.4	-7.5	14.8

Notes: the table reports values for questions shown in Table 4.

APPENDIX B: SURVEY QUESTIONS RELATED TO ELICITING WILLINGNESS TO PAY

We would like to ask you about the rate of inflation/deflation (Note: inflation is the percentage rise in overall prices in the economy, most commonly measured by the Consumer Price Index and deflation corresponds to when prices are falling).

13. In THIS question, you will be asked about the probability (PERCENT CHANCE) of something happening. The percent chance must be a number between 0 and 100 and the sum of your answers must add up to 100.

What do you think is the percent chance that, **over the next 12 months**…

	Percentage Chance
the rate of inflation will be 12% or more	_____
the rate of inflation will be between 8% and 12%	_____
the rate of inflation will be between 4% and 8%	_____
the rate of inflation will be between 2% and 4%	_____
the rate of inflation will be between 0% and 2%	_____
the rate of deflation (opposite of inflation) will be between 0% and 2%	_____
the rate of deflation (opposite of inflation) will be between 2% and 4%	_____
the rate of deflation (opposite of inflation) will be between 4% and 8%	_____
the rate of deflation (opposite of inflation) will be between 8% and 12%	_____
the rate of deflation (opposite of inflation) will be 12% or more	_____
% Total [TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]	_____

14. Over the **last** 12 months, what do you think the overall rate of inflation/deflation has been **in the economy**?
Answer: The rate of inflation/deflation was _____ percent over the last 12 months.
If you think there was inflation, please enter a positive number. If you think there was deflation, please enter a negative number. If you think there was neither inflation nor deflation, please enter zero.
[RANGE: -100 to 100 ALLOW FOR UP TO 2 DECIMAL POINTS]

Q50B. What do you think the inflation rate (as measured by the Consumer Price Index) is going to be over the next 12 months? Please provide an answer as a percentage change from current prices.
……. % [RANGE: -100 to 100, ONE DECIMAL]
If you think there will be inflation, please enter a positive number. If you think there will be deflation, please enter a negative number. If you think there will be neither inflation nor deflation, please enter zero.

Q101A.
In THIS question, you will be asked about the probability (PERCENT CHANCE) of something happening. The percent chance must be a number between 0 and 100 and the sum of your answers must add up to 100.

Think about your monthly household spending now compared to your household spending in one year.

What do you think is the percent chance that, **over the next 12 months**…
;PN: RESPONDENTS ENTRIES NEEDS TO TOTAL 100% ACROSS THE 10 OPTIONS BUT THEY DO NOT NEED TO FILL IN EVERY BOX.

	Percent chance
My household spending will **increase** by 12% or more	
My household spending will **increase** by 8% or more, but less than 12%	
My household spending will **increase** by 4% or more, but less than 8%	

My household spending will **increase** by 2% or more, but less than 4%	
My household spending will **increase** by 0% or more, but less than 2%	
My household spending will **decrease** by more than 0%, but less than 2%	
My household spending will **decrease** by 2% or more, but less than 4%	
My household spending will **decrease** by 4% or more, but less than 8%	
My household spending will **decrease** by 8% or more, but less than 12%	
My household spending will **decrease** by 12% or more	
% Total [TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]	

Q101B.
Again, you will be asked about the probability (PERCENT CHANCE) of something happening. The percent chance must be a number between 0 and 100 and the sum of your answers must add up to 100.

Thinking about your monthly consumption expenditures now, compared with your monthly consumption expenditures (adjusted for inflation) in 2029.

What do you think is the percent chance that, in **2029** …
;PN: RESPONDENTS ENTRIES NEEDS TO TOTAL 100% ACROSS THE 10 OPTIONS BUT THEY DO NOT NEED TO FILL IN EVERY BOX.

	Percent chance
My household spending will **increase** by 20% or more	
My household spending will **increase** by 15% or more, but less than 20%	
My household spending will **increase** by 10% or more, but less than 15%	
My household spending will **increase** by 5% or more, but less than 10%	
My household spending will **increase** by 0% or more, but less than 5%	
My household spending will **decrease** by more than 0%, but less than 5%	
My household spending will **decrease** by 5% or more, but less than 10%	
My household spending will **decrease** by 10% or more, but less than 15%	
My household spending will **decrease** by 15% or more, but less than 20%	
My household spending will **decrease** by 20% or more	
% Total [TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]	

Q102.
Below you see 10 possible ways in which the economy could **grow or shrink over the next 12 months**. Please assign probabilities to these possibilities, to indicate how likely you think it is that each possible change will happen. The percent chance must be a number between 0 and 100 and the sum of your answers must add up to 100.

;PN: RESPONDENTS ENTRIES NEEDS TO TOTAL 100% ACROSS THE 10 OPTIONS BUT THEY DO NOT NEED TO FILL IN EVERY BOX.

	Percent chance
The economy will grow by 12% or more	
The economy will grow by 8% or more, but less than 12%	
The economy will grow by 4% or more, but less than 8%	
The economy will grow by 2% or more, but less than 4%	
The economy will grow by 0% or more, but less than 2%	
The economy will shrink by more than 0%, but less than 2%	
The economy will shrink by 2% or more, but less than 4%	
The economy will shrink by 4% or more, but less than 8%	
The economy will shrink by 8% or more, but less than 12%	
The economy will shrink by 12% or more	
% Total [TOTAL ANSWERS FROM ABOVE – MUST SUM TO 100%]	

;PN: Questions Q103, Q104, Q105: THE **<DRAW>** NEEDS TO BE RANDOMIZED BASED ON LOWEST READS ={"SHRINKS BY 6"; "SHRINKS BY 4"; "SHRINKS BY 2"; "GROWS BY 2"; "GROWS BY 4"; "GROWS BY 6"}. THE SAME **DRAW** SHOULD APPLY TO EACH OF THE 3 QUESTIONS (Q103, Q104, Q105).

;PN: Questions Q103, Q104, Q105:

Q103.
We would like to know how much you think your household **spending** varies with how well the economy does in the future.

Suppose that **the economy <DRAW>** percent in 2025 relative to 2024. By how much would you expect your household **spending** to change?

Please use the slider below to provide your response in percentage terms. If you think you (and your household's) earnings would increase, please select a positive number. If you think you (and your household's) earnings would decrease, please enter a negative number. If you think your earnings would stay exactly the same, please enter zero.
;Coding: Numerical entry with range -25 to 25
;Scripting instruction:
- show a slider without anchoring (range: -25% to 25%)
- show a numerical entry box on top of the slider bar which moves with the slider
- show labels on the slider bar at "-25% or less", "0%" and "25% or more"
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

The annual spending of my household would change by __ % in 2025 relative to the annual spending in 2024.

Q104
We would like to know how much you think your (and your household's) **earnings** vary with how well the economy does in the future.

Suppose that **the economy <DRAW>** percent in 2025 relative to 2024. By how much would you expect your household's **earnings** to change?

Please use the slider below to provide your response in percentage terms. If you think you (and your household's) earnings would increase, please select a positive number. If you think you (and your household's) earnings would decrease, please enter a negative number. If you think your earnings would stay exactly the same, please enter zero.
;Coding: Numerical entry with range -25 to 25
;Scripting instruction:
- show a slider without anchoring (range: -25% to 25%)
- show a numerical entry box on top of the slider bar which moves with the slider
- show labels on the slider bar at "-25% or less", "0%" and "25% or more"

If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

The annual earnings of my household would change by __ % in 2025 relative to the annual earnings in 2024.

Q105
We would like to know how you think the **total value of youR (and your household's) financial assets**, excluding housing, varies with how well the economy does in the future.

Suppose that **the economy <DRAW>** percent in 2025 relative to 2024. By how much would you expect the total value of your (and your household's) **financial assets**, excluding housing, to change?

Please use the slider below to provide your response in percentage terms. If you think you (and your household's) earnings would increase, please select a positive number. If you think you (and your household's) earnings would decrease, please enter a negative number. If you think your earnings would stay exactly the same, please enter zero.
;Coding: Numerical entry with range -25 to 25
;Scripting instruction:

- show a slider without anchoring (range: -25% to 25%)
- show a numerical entry box on top of the slider bar which moves with the slider
- show labels on the slider bar at "-25% or less", "0%" and "25% or more"

If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

The total value of my (and my household's) financial assets, excluding housing, would change by __% in 2025 relative to their value in 2024.

; SCRIPTING INSTRUCTION FOR AM4010_QX1, QX2, QX3, QX4 AND QX5:
- RANDOMISE ORDER OF ITEMS, VERSION 1: 50/50 CHANCE, GUARANTEED PAYMENT; VERSION 2: GUARANTEED PAYMENT, 50/50 CHANCE. PLEASE INCLUDE A VARIABLE INDICATING THE VERSION (**AM4010_ VERSION**). THE ORDERING OF RESPONSE ITEMS SHOULD BE THE SAME WITHIN RESPONDENT FOR ALL QUESTIONS.

;Intro text
Please imagine the following hypothetical situation where you are offered two choices:

You can choose between a guaranteed payment of a particular amount of money, or a gamble like tossing a coin, where you would have an equal chance of getting $300 or getting nothing.

On the next screens, we will present to you **five different situations**. Please tell us what you would do in each of the situations.

AM4010_QX1. What would you prefer: a draw with a 50 percent chance of receiving $300, and the same 50 percent chance of receiving nothing, or a guaranteed payment of $160?
() 50/50 chance
() Guaranteed payment
;IF AM4010_QX1=SELECTED "50/50 CHANCE" INSERT 1= "$ 240"
;IF AM4010_QX1=SELECTED "GUARANTEED PAYMENT" INSERT 1= "$ 80"

AM4010_QX2. Would you prefer the 50/50 chance of $300 vs $0 or a guaranteed payment of [INSERT1]?
() 50/50 chance
() Guaranteed payment
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" INSERT2= "$ 280"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" INSERT2= "$ 200"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" INSERT2= "$ 120"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" INSERT2= "$ 40"

AM4010_QX3. Would you prefer the 50/50 chance of $300 vs $0 or a guaranteed payment of [INSERT2]?
() 50/50 chance
() Guaranteed payment
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" INSERT3= "$ 300"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" INSERT 3= "$ 260"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" INSERT 3= "$ 220"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" INSERT 3= "$ 180"

;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" INSERT 3= "$ 140"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" INSERT 3= "$ 100"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" INSERT 3= "$ 60"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" INSERT 3= "$ 20"

AM4010_QX4. Would you prefer the 50/50 chance of $300 vs $0 or a guaranteed payment of [INSERT3]?
() 50/50 chance

() Guaranteed payment

;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 310"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 290"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 270"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 250"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 230"

;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 210"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 190"
;IF AM4010_QX1 SELECTED "50/50 CHANCE" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 170"

;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 150"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 130"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 110"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "50/50 CHANCE" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 90"

;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 70"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "50/50 CHANCE" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 50"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "50/50 CHANCE" INSERT 4= "$ 30"
;IF AM4010_QX1 SELECTED "GUARANTEED PAYMENT" AND QX2 SELECTED "GUARANTEED PAYMENT" AND QX3 SELECTED "GUARANTEED PAYMENT" AND QX4 SELECTED "GUARANTEED PAYMENT" INSERT 4= "$ 10"

AM4010_QX5. Would you prefer the 50/50 chance of $300 vs $0 or a guaranteed payment of [INSERT4]?

() 50/50 chance
() Guaranteed payment

; RANDOMIZE OVER DIFFERENT VERSIONS (A,B,C,D,E,F) OF QUESTION Q110. RESPONDENTS SEE ONLY ONE VERSION OF THE QUESTION. RANGE FOR EACH SHOULD BE 0-100 WITH 2 DECIMAL PLACES, NO NEGATIVE NUMBERS

Q110A

Average economic growth in recent years is 2.5%. Based on historical records, economic growth in 2025 is expected to fluctuate between 1.1% and 4.7% throughout the year.

Suppose that you could reduce the fluctuation in economic growth as measured by total economic output (GDP) in 2025 by giving up a portion of your yearly spending. Now please fill the blank in the following sentence.

To make economic growth stable at 2.5% in 2025, I would be willing to reduce my spending by __ % over the next 12 months.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

Q110B

Average economic growth in recent years is 2.5%. Based on historical records, economic growth is expected to fluctuate between 1.1% and 4.7% in 2025.

Suppose that you could reduce the fluctuations in economic growth in 2025-2029 by giving up a portion of your yearly spending. Now please fill the blank in the following sentence.

To make economic growth rate stable at 2.5% in 2025-2029, I would be willing to reduce my spending by __% per year.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

Q110C

The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. On average, in a boom the economy expands by 2.8% and the unemployment rate is 5.5%.

However, sometimes the economy experiences a recession, meaning output contracts (negative economic growth) and unemployment is high. On average, in a recession the economy contracts by 2.5% and unemployment is 8.2%. Although the economy fluctuates, the average growth rate of GDP is 2.5% and the average rate of unemployment is 5.7%.

Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs?

I would be willing to reduce my annual consumption by __ % to have stable growth.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

Q110D

The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. In a boom the economy can expand by as much as 12.0% and the unemployment rate can fall to 3.4%. However, sometimes the economy experiences a recession, meaning output contracts and unemployment is high. In a recession the economy contracts by as much as 7.5% and unemployment can rise to 14.8%.

Although the economy fluctuates, the average growth rate of the economy is 2.5% and the average rate of unemployment is 5.7%.

Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs?

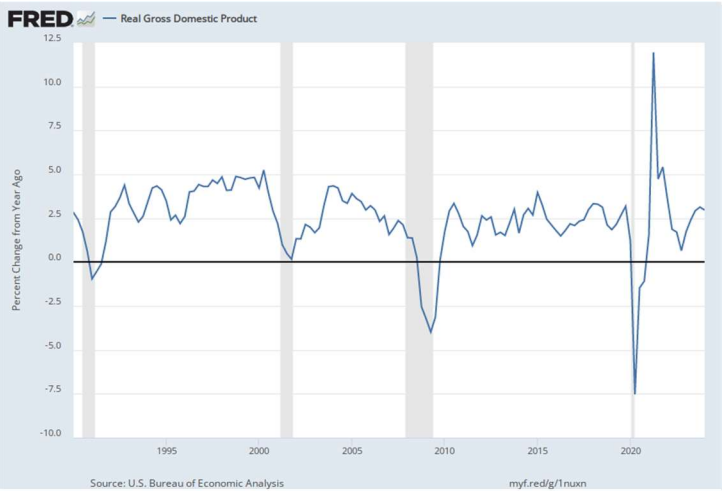
I would be willing to reduce my annual consumption by __% to have stable growth.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

Q110E

The U.S. economy goes through business cycles. Sometimes the economy experiences a boom, when output and incomes increase and unemployment is low. However, sometimes the economy experiences a recession, meaning output contracts and unemployment is high.

The figures show how much the growth rate of economic growth and the rate of unemployment can vary over the business cycle.





Suppose that you could avoid business cycles, i.e. booms and recessions, by reducing your annual consumption by a certain percentage. By how much would you be willing to reduce your consumption to have stable growth without ups and downs?

I would be willing to reduce my annual consumption by ____% to have stable growth.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

Q120
Please think about **the next three years**. Which **change** in the general level of prices of goods and services (per year) would be the most beneficial for your household?

Please use the slider below to provide your response in percentage terms.

;PN:
;Coding: Numerical entry with range -10 to 10
;Scripting instruction:

- show a slider without anchoring (range: -10% to 10%)
- show a numerical entry box on top of the slider bar which moves with the slider
- show labels on the slider bar at "-10% or less", "0%" and "10% or more"
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.
- Please save the value reported to this question in a scalar <p> for inserts below

Q121
Suppose that you could ensure that the **change** in the general level of goods and services is close to your preferred rate every year by reducing your annual consumption over the next three years by a certain percentage. By how much would you be willing to reduce your consumption to achieve this outcome?

I would be willing to reduce my annual consumption by __% to have a change in the general level of goods and services in the country I currently live in close to <p>% per year.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

;PN:Q121 Coding: Two numeric boxes with range 0 to 100 and 0-9
;Scripting instruction:

- Show 2 boxes with a decimal point in-between. Range for 1st box: 0 to 100; range for 2nd box: 0-9
- Range of resulting number should be 0 to 100.
- <p> is the value of the response in Q120.

Q122
In the first part of the survey, you predicted that prices of goods and services would change by <yyy.y>% over the next 12 months.

Suppose that you could bring the **change** in the general level of prices for goods and services **over the next 12 months** to your preferred rate of <p>% per year by reducing your consumption over the next 12 months by a certain percentage. By how much would you be willing to reduce your consumption to achieve this outcome?

I would be willing to reduce my consumption over the next 12 months by __% to change the rate of change in the general level of goods and services from <yyy.y>% over the next 12 months to my preferred rate of <p>% per year.

Please give your best guess in percentage terms. You can provide a number up to one decimal place.

; if <p>% is not equal to <yyy.y>%

; Coding: Two numeric boxes with range 0 to 100 and 0-9

; Scripting instruction:

- Show 2 boxes with a decimal point in-between. Range for 1st box: 0 to 100; range for 2nd box: 0-9
- Range of resulting number should be 0 to 100.
- <yyy.y> is from question Q50B
- Question type: [numeric box]

; if <p>% is lower than <yyy.y>% OK

Q131A
Suppose reducing the **change** in the general level of prices for goods and services from your forecast of <yyy.y>% to your preferred rate of <p>% per year would lead to an **increase unemployment** over the next 12 months.

What maximum increase in the rate of unemployment would you accept to achieve this outcome?

I would accept at most:

1	No increase in unemployment
2	1 percentage point increase in unemployment
3	2 percentage point increase in unemployment
4	3 percentage point increase in unemployment
5	4 percentage point increase in unemployment
6	5 percentage point increase in unemployment
7	6 percentage point increase in unemployment
8	7 percentage point increase in unemployment
9	8 percentage point increase in unemployment
10	9 percentage point increase in unemployment
11	10 percentage point or more increase in unemployment

; IF <P>% IS GREATER THAN <YYY.Y>%

Q131B
Suppose raising the **change** in the general level of prices of goods and services from your forecast <yyy.y>% to your preferred rate <p>% per year would **increase unemployment** over the next 12 months.

What maximum increase in the rate of unemployment would you accept to achieve this outcome?

I would accept at most:

1	No increase in unemployment
2	1 percentage point increase in unemployment
3	2 percentage point increase in unemployment
4	3 percentage point increase in unemployment
5	4 percentage point increase in unemployment
6	5 percentage point increase in unemployment
7	6 percentage point increase in unemployment
8	7 percentage point increase in unemployment
9	8 percentage point increase in unemployment
10	9 percentage point increase in unemployment
11	10 percentage point or more increase in unemployment

; if <p>% is lower than <yyy.y>% OK

Q132A
Suppose reducing the **change** in the general level of prices of goods and services from your forecast of <yyy.y>% to your preferred rate of <p>% per year would **lower the growth rate of GDP** over the next 12 months.

What maximum decrease in the growth rate of GDP would you accept to achieve this outcome?

I would accept at most:

1	No decrease in the growth rate of GDP
2	1 percentage point decrease in the growth rate of GDP
3	2 percentage point decrease in the growth rate of GDP
4	3 percentage point decrease in the growth rate of GDP
5	4 percentage point decrease in the growth rate of GDP
6	5 percentage point decrease in the growth rate of GDP
7	6 percentage point decrease in the growth rate of GDP
8	7 percentage point decrease in the growth rate of GDP
9	8 percentage point decrease in the growth rate of GDP
10	9 percentage point decrease in the growth rate of GDP
11	10 percentage point or more decrease in the growth rate of GDP

; if <p>% is greater than <yyy.y>% OK

Q132B

Suppose raising the **change** in the general level of prices of goods and services from your forecast of <yyy.y>% to your preferred rate of <p>% per year would **lower the growth rate of GDP** over the next 12 months.

What maximum decrease in the growth rate of GDP would you accept to achieve this outcome?

I would accept at most:

Coding:

1	No decrease in the growth rate of GDP
2	1 percentage point decrease in the growth rate of GDP
3	2 percentage point decrease in the growth rate of GDP
4	3 percentage point decrease in the growth rate of GDP
5	4 percentage point decrease in the growth rate of GDP
6	5 percentage point decrease in the growth rate of GDP
7	6 percentage point decrease in the growth rate of GDP
8	7 percentage point decrease in the growth rate of GDP
9	8 percentage point decrease in the growth rate of GDP
10	9 percentage point decrease in the growth rate of GDP
11	10 percentage point or more decrease in the growth rate of GDP